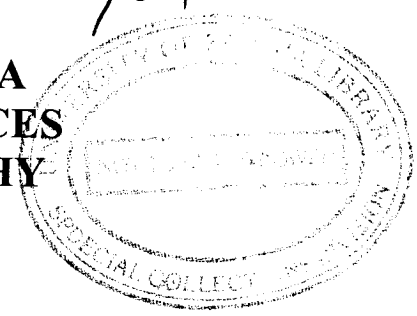
THE UNIVERSITY OF ZAMBIA
SCHOOL OF NATURAL SCIENCES
DEPARTMENT OF GEOGRAPHY



SMALL SCALE FARMERS' ADJUSTMENT TO AGRICULTURAL ECONOMIC LIBERALISATION IN SELECTED VILLAGES OF KASAMA DISTRICT, NORTHERN PROVINCE, ZAMBIA

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DEDICATION

To my father, mother, brothers and sisters.

DECLARATION

I Sinkala Aaron declare that this is my original work and that the maps and tables were prepared by me. All the sources of material used in this work have been acknowledged and the project has not previously been submitted for any academic award.

4 - 5 - 2000

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ABBREVIATIONS

CSO	-	Central Statistical Office
CDR	-	Centre for Development Research
FAO	-	Food and Agriculture Organisation
GRZ	-	Government of the Republic of Zambia
MMD	-	Movement for Multi-party Democracy
MAFF	-	Ministry of Agriculture, Food and Fisheries
SAP	-	Structural Adjustment Programme

road infrastructure and the effects of these problems on the rural farmers have been devastating.

The farmers in selected villages of Kasama district have adjusted by adopting the alternative low cost techniques of crop cultivation and the cultivation of crops that require less or no mineral fertilizer. Farmers now and without any well established formal marketing systems are selling their produce to individual customers either for cash or in exchange with other goods at poorly organised local markets.

These adjustment strategies, especially the alternative low cost techniques are very fragile and although they incorporate traditional knowledge that has existed for a very long period of time, they fail to yield greater positive results in that they are being applied on soils that initially were too dependent on chemical fertilizers.

Marketing systems that are unreliable and informal segregate the rural farmers from the formal national economy. Such marketing systems are undesirable and retrogressive.

All in all small scale farmers have a major role to play in the provision of food to the majority of the people. It is therefore, important that this category of farmers is incorporated in the entire national economy.

CHAPTER ONE

1.0 INTRODUCTION

Agriculture in Zambia ranks among the most important economic activities. Since independence and up until 1982, the Zambian government supported a heavily subsidised agricultural system under the pretext that subsidies were crucial both for assisting small scale farmers especially in rural areas to promote their farming and for protecting the urban poor from rising food prices at the time when incomes were being eroded by inflation.

For small scale farmers, subsidies on farm inputs such as fertilizers, seeds and equipment and government support services such as extension, credit and crop marketing for over a decade did not only lead to an increase in maize yields but also facilitated the move from traditional methods of crop cultivation to modern ones (Milimo, 1990 and Wood et al, 1990).

From the early 1980s and with the gradual involvement of the International Monetary Fund (IMF) in Zambia's economic affairs, more radical reforms in Zambia's agricultural system that go towards economic liberalisation had started to emerge (Mwanza, 1992). The first move towards liberal economic policies in agriculture came in 1980 when price control was removed from non-basic consumer goods. Later, in the period between 1984 and 1987 subsidies on fertilizer were reduced and the prices for inputs were regionalised so as to make them reflect the transport costs. Other radical moves

involved reducing the monopoly powers of the parastatal marketing agencies by encouraging other agencies to participate in the marketing system. These and other liberal economic policies in agriculture did not last long in that by 1987 Zambia broke relations with the International Monetary Fund and decided to pursue policies other than those proposed by the IMF. Between 1987 and 1988 subsidies in agriculture had greatly increased (Sakamoto, 1990).

In the 1990s and after going through times of economic hardships Zambian began to seek financial help from the IMF and the World Bank. Since Zambia re-established its relations with the IMF and the World Bank and since the country became under the Movement for Multi-party Democracy (MMD), the government began to adopt and implement the Structural Adjustment Programme (SAP) and in particular policies of economic liberalisation with greater vigour than before (Young et al, 1990 and Kokwe, 1997).

In a liberalised economy farmers are supposed to benefit from the greater openess in the economy, competitive marketing channels, improved prices for their produce, greater reliance on market forces and free decision making on both input use and production choices (Deng et al, 1991). The price for the farmers produce is that which is obtainable at the market or points of sale and not the price determined by the marketing boards. Furthermore, the removal of trade restrictions should enable the farmers to trade freely and increase their income from their sales which would in turn increase their

consumption of goods and provide cash for purchases of improved inputs (Deng et al, 1991).

Farmers on the other hand will have to contend with a number of challenges. They will have to forego subsidies on fertilizers, seeds and other inputs, share in the cost of health care and educational delivery, deal with muliple private agents and accept a small state whose only role is to provide an enabling environment. Support services such as extension, credit and marketing services which were initially provided by the state have become a responsibility of private agents. It is from this background that an investigation on small scale farmers' adjustment to agricultural economic liberalisation in selected villages of Kasama district is shaped from.

1.1 STATEMENT OF THE PROBLEM

Since the 1990s the role of the government in the provision of support services to the farming community has shrunk considerably. Having lost government support, small scale farmers in Kasama district and other parts of the country find it increasingly difficult now to secure farm inputs especially fertilizers and seeds, to store and market their produce if at all they manage to have any surplus. Small scale farmers, now, buy their farm inputs directly from the private agents and that way they are forced to face exorbitant prices. Credit facilities are non existent and where they exist they cannot be easily obtained by small scale farmers, largely because this category

of farmers has little or no resources to present to the private agencies as collatoral security.

Private agencies, furthermore, are rarely willing to sell the farm inputs or buy produce from small scale farmers in remote areas in that they are likely to incur more transport costs and realise less profits by trading with people in such areas. All these instances are taking place at a time when the small scale farmers in Kasama district are being asked by the government to share in the cost of health care and cost of educating their children. There is, therefore, need to investigate how small scale farmers are adjusting to agricultural economic liberalisation in selected villages of Kasama district.

1.2 OBJECTIVES

The objectives of this study are as follows:

1. To find out the extent to which small scale farmers are making use of alternative low cost techniques of crop cultivation.

2. To determine the extent to which small scale farmers are cultivating crops other than maize which require less fertilizers and other inputs.

3. To investigate the techniques and strategies that small scale farmers are using to market their surplus produce.

1.3 RATIONALE

The aim of the investigation is to bring to light the possible adjustment strategies that small scale farmers have adopted in response to the shrinking government role in the provision of support services to the farmers on one hand and the growing participation of private agencies in an attempt to take up those roles initially performed by the state. In selected areas of Kasama district it is most likely that the small scale farmers have adopted farming strategies that are ideal to themselves and that can be improved upon so that they can become applicable on a large scale basis in areas where they prove to be geographically and ecologically suitable.

It is hoped that the information that will be obtained from this research will add to the existing body of knowledge and help decision makers in the agricultural sector to make well informed decisions not only in selected villages of Kasama district but also in other parts of the country.

1.4 DEFINITION OF KEY TERMS

Agriculture Science or practice of cultivating the land or rearing animals. It is also called farming. (Oxford Advanced Learner's Dictionary, 1989).

Economic Designed to give profit (Oxford Advanced Learner's Dictionary, 1989).

Liberalise To free something from political or state control (Oxford Advanced Learner's Dictionary, 1989).

Agricultural Economic Liberalisation Freeing crop cultivation from state and political control in order to make it more efficient and profitable.

Permanent Lasting or expected to last for a long time or forever (Oxford Advanced Learner's Dictionary, 1989).

Cultivate Prepare and use land for growing crops (Oxford Advanced Learner's Dictionary, 1989).

Permanent Cultivation Continuous crop growing on the same plot without resting periods of fallow.

Semi-permanent Continuous agricultural system where cropping periods are relatively longer so as to exceed fallow periods (Arnon, 1981).

Shifting Cultivation Continuous agricultural system in which the cropping period is shorter than the fallow periods (Arnon, 1981).

Adjustment Become or make suited to new conditions. (Oxford Advanced Learner's Dictionary, 1989).

Alternative Low Cost Techniques of Crop Cultivation Available methods of growing crops that cost less in terms of finances and that can replace the costly methods.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 INTRODUCTION

In the 1970s and the 1980s African governments noticed that mistakes were made in the way they formulated and implemented internal policies and as such they embarked on structural adjustment programmes as corrective policy measures. The structural adjustment programmes supported by the International Monetary Fund (IMF) and the World Bank are supposed to restructure the economy, restore the position of agriculture and increase the necessary environment for sustainable economic development (Spooner and Smith, 1991). A major facet of the IMF and World Bank sponsored structural adjustment programmes is economic liberalisation and it is this aspect and especially with reference to the agricultural sector that is of interest to this study.

2.2 STUDIES ON AGRICULTURAL ECONOMIC LIBERALISATION IN SUB-SAHARA AFRICA

In sub-sahara Africa, numerous studies have been carried out on economic liberalisation of the agricultural sector. Most of these studies, however, focus particular attention on the effects that the liberal economic policies have had on the farmers.

Examples from Malawi, Ghana and Nigeria support the above assertion.

In Malawi food market liberalisation was introduced in 1987 but there were initial technical and acceptance problems due to the speed of implementation under donor pressure. Subsidy withdrawal in Malawi was done at the same time for both the small holder and estate producers and this led to tremendous increases in the price of fertilizers. Comparing 1983-1984 and 1986-1987, Malawi's fertilizer consumption declined by 7% and the area planted with hybrid maize declined by 50% (Deng et al, 1991). Research findings by Alamagir et al (1991) show that the emergence of private agents has not been beneficial to the small holder producers in Malawi. The private agents have proved to be exploitative and dishonest to the small holder producers. The private agents also face the problem of inadequate finances and as such they cannot effectively offer the much needed credit facilities to the small holder farmers. Agricultural economic liberalisation has, therefore, not only ignored the interests of the small scale farmers but has also worsened their conditions. The estate producers have been spared, some how, because of their access to international markets, production of lucrative crops and greater economic power.

In Ghana studies by CDR (1990) have shown that the food growing sector has largely escaped the attention of policy

makers, although it has not been neglected when it comes to subsidy removal on inputs. And by virtue of the fact that the incentives to grow cocoa, a cash crop have been increased, production arrangements have been turned against food crop cultivation a situation which has seen the prospect of small scale farmers' economic progress worsen.

In Nigeria the focus of research with respect to agricultural economic liberalisation is not too different from that which obtains in most sub-saharan african countries. Studies by Food and Agricultural Organisation (1991a) have revealed that the introduction of private agents in the marketing system has failed to bring about any effective competition among the participants. The cocoa association of Nigeria which represents mainly exporters is also reported to have earned a bad name from the small scale farmers, who have accused it of forcing prices down in order to boost the traders profits. Privatisation of the marketing channels in Nigeria has led not only to collusion and shady practices but also to poor quality control.

The studies from the selected countries in sub-saharan Africa illustrate the serious impendiments that small scale farmers have to contend with in a liberalised agricultural sector.

2.3 STUDIES ON AGRICULTURAL ECONOMIC LIBERALISATION IN ZAMBIA

The Zambian government agricultural policy goal has been to increase agricultural production and reach self sufficiency in food. Prior to the 1990s this goal of food self sufficiency was pursued with a highly regulated agricultural marketing and input supply system. In the post 1990s strategies to achieve the goal have included the liberalisation of the agricultural marketing and pricing system (GRZ, 1991).

In Zambia as the case is in most parts of sub-saharan Africa, research on economic liberalisation of the agricultural sector has focussed particular attention on the impact that these new policies have brought about especially with regard to the farming community. Studies by Alamagir et al (1991) have shown that small scale farmers and food insecure households are normally short of cash to purchase the current expensive inputs at the market. Small scale farmers need access to credit also, but under the current reform policies this scenario is either non existent or inadequate. Impact studies No. 7 (1995) have revealed also that subsidy withdrawal has not only led to greater increases in the price of fertilizer but also to greater reductions in the acreage of maize fields. In fact, production of maize also continue to decline as the case is with Eastern, Southern and Central Provinces which recorded reductions in maize production of 50%, 30% and another 50% respectively in the 1993/94 season.

Studies by F.A.O. (1990) have indicated that liberalisation in rural areas has implied sudden changes in markets and organisation of agricultural services. Arguing on similar lines Mickels (1997) points out that a farmer who obtained credit one year had virtually no knowledge of the conditions under which he was to repay the loan the following year. Farmers also have very little and much distorted knowledge of conditions for crop marketing under liberalisation. Poor knowledge of market oriented production led farmers in some parts of Luapula province to become victims of unscrupulous businessmen (Mickels, 1997).

Studies by F.A.O. (1991b) have tried to show among other things that private trading in agricultural commodities after liberalisation has not been impressive especially on the part of small scale rural farmers. Poor organisation of the rural markets and the unwillingness of the private sector to step in and take over the service functions initially performed by government for rural farmers but have also isolated them from the national economy with the advent of economic liberalisation. GRZ (1996) has also pointed out that many of the poor farmers in rural areas tend to suffer the most under an economy that has no direct protection for them.

Although most of the studies on agricultural economic liberalisation in Zambia pay particular attention to the impacts of such reform policies on the farming community, Mickels

(1997) in his studies on the contrary, has tried to show an aspect which focusses on how farmers are coping with structural adjustment. This has been done, however, with particular reference to maize production only. To this effect Mickels (1997) has analysed the major parameters underlying the success of the maize boom prior to liberatlisation and how they have been affected by economic restructuring in the post liberalisation times. From the farmer perspective the three parameters involved increasing risk of market failures; loss of access to credit and loss of access to inputs. Further more Mickels studies concentrated on the parts of Luapula province.

It is, therefore, important that a study on small scale farmers' adjustment to agricultural economic liberalisation in the selected villages in Kasama district to be conducted.

CHAPTER THREE

3.0 DESCRIPTION OF THE STUDY AREA

3.1 LOCATION

In general terms northern Province has nine districts namely Kasama, Kaputa, Chilubi, Luwingu, Mbala, Mporokoso, Chinsali, Isoka and Mpika. Kasama distict is the provincial headquarters of northern Province (see figure 1).

The survey areas are found in Kasama district and they constitute three villages namely Musa, Mulanshi and Lukupa. Musa village is 14 kilometres south of Kasama, Mulanshi is 17 kilometres south-west of Kasama and Lukupa is 10 kilometres east of Kasama (see figure 2).

3.2 CLIMATE

Kasama district in which the survey areas are found is characterised by warm wet summers and cool dry winters. Temperatures are relatively moderate over the seasons. Monthly minimum temperatures of 10°C and maximum temperatures of 32°C are experienced in Kasama district. The district lies in a high rainfall belt and mean annual rainfall ranges between 1000mm and 1400mm. Rainfall begins in November and ends in April (Holden, 1983).

3.3 GEOLOGY AND SOILS

Kasama district lies between 1300m and 1400m above sea level. The landscape is generally flat with very gently slopes though gently undulating in some parts. The soils are greatly acidic and heavily leached and they are generally poor agricultural soils.

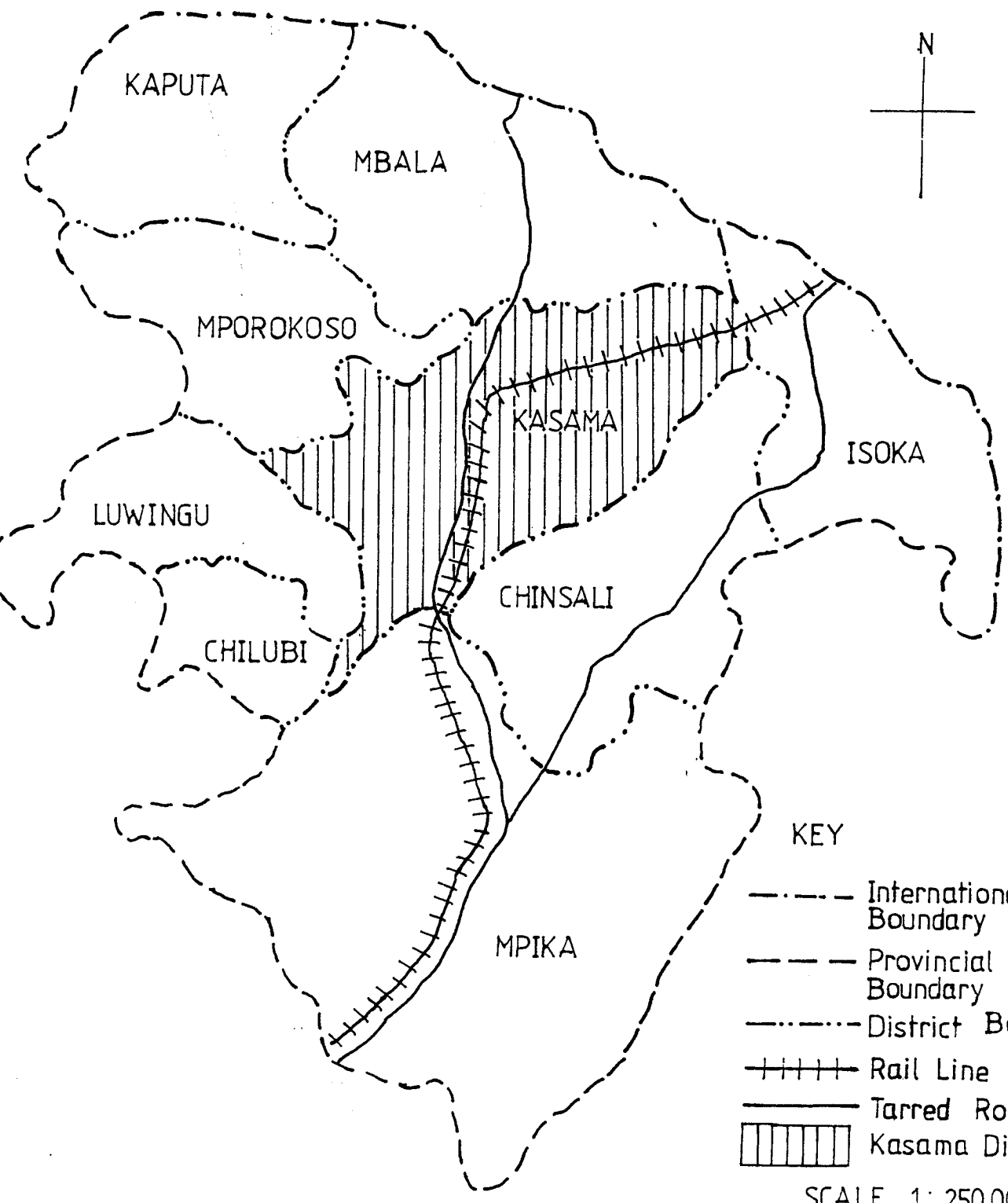
3.4 VEGETATION

Vegetation in Kasama district is generally that of Miombo woodland. But due to Chitemene, a cultivation practice which has been predominant for a longer period of time in Kasama the Miombo woodland has tremendously decreased in both density and size.

3.5 POPULATION

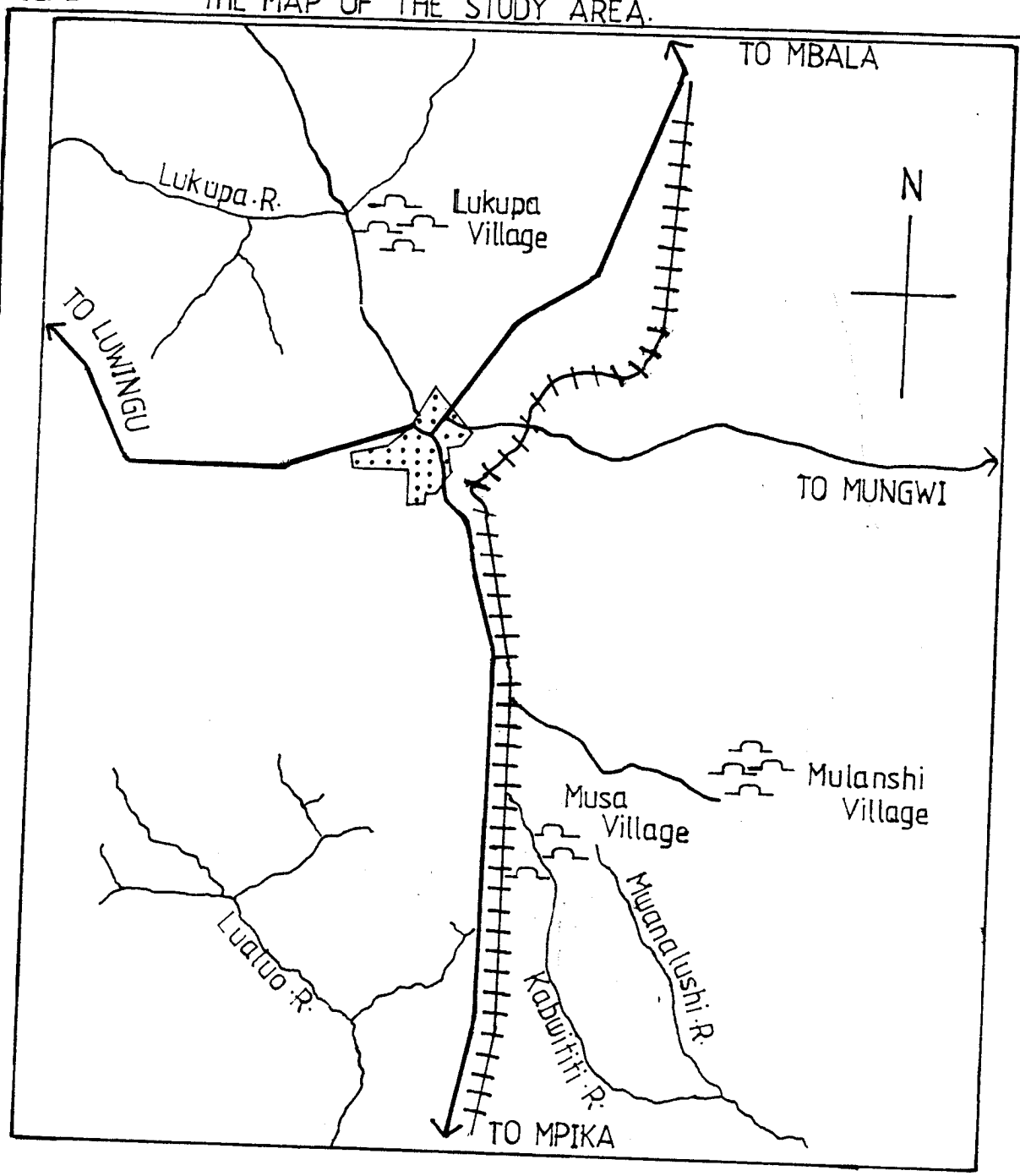
According to the 1990 census results Kasama district had a population of 192,046 of which 98,292 were females and 93,754 were males. The district has an area of 25,806km^2 and a population density of 7.5 persons per square kilometre. It is most likely that the population of Kasama has increased from the 1990 census results (C.S.O, 1993).

IG. 1 THE MAP OF NORTHERN PROVINCE.



RCE G RZ, 1990

FIG. 2 THE MAP OF THE STUDY AREA.



KEY

- Railway
- Main Highway
- Maintained Road
- River
- Town
- Study Areas

SOURCE SC-36-9 KASAMA 1991. SCALE 1:250,000

CHAPTER FOUR

4.0 METHODOLOGY

The purpose of this chapter is to show the data sources and data collection techniques employed in this study, the sample size and sampling procedure, data processing and analysis methods and the problems that the researcher encountered in the field.

4.1 DATA SOURCES AND DATA COLLECTION TECHNIQUES

Data pertaining to the study were obtained from both secondary and primary sources with the latter being the major source.

4.2 SECONDARY SOURCES OF DATA

The major sources of secondary data were the University of Zambia Main Library, Ministry of Agriculture, Food and Fisheries and Lending and Marketing Agencies. Secondary data were obtained by way of reading materials such as books, journals and unpublished reports. These sources provided the researcher with information regarding studies on the policies of economic liberalisation in the agricultural sector in sub-sahara Africa and in Zambia in particular.

4.3 PRIMARY SOURCES OF DATA

Primary data on the study were collected from the selected villages through scheduled structured interviews. Primary data that were collected involved that on alternative low cost techniques of

cultivation that small scale farmers are making use of, crops that require less inputs that small scale farmers are cultivating other than maize and strategies that small scale farmers are using to market their surplus produce. Scheduled structured interviews (questionnaires) were administered to the respondents and filled directly by the researcher. This way the illiteracy problem among the small scale farmers posed little or no problems at all.

A separate questionnaire or simply an interview guide was also used to source primary data from the agricultural officers. This made it possible for the researcher to gather extra data that could not be obtained with the previous technique.

4.4 SAMPLE SIZE AND SAMPLING PROCEDURE

A sample of 45 respondents was interviewed out of a total number of 1,344 households in the selected villages namely Musa, Mulanshi and Lukupa in Kasama district. A sample of 45 was considered adequate and convenient for the researcher to handle bearing in mind the fact that he had to move from one household to the other a task which is costly and tiring.

The three villages, Musa, Mulanshi and Lukupa were purposefully chosen. These villages are in the rural areas of Kasama district and are, therefore, likely to harbour considerable numbers of small scale farmers.

A simple random sampling method was used to arrive at a sample of 45 respondents. Simple random sampling method is not only simple to utilise but also convenient for a small sample size and in a rural setting where houses are not arranged in any order. Nevertheless, its main limitation is its reliance on the existence of complete, unbiased population list a condition which rarely obtains in actual life situations.

Sampling basically involved assigning numbers to all the households in the three villages. The number of households in the three villages were written down on well cut pieces of paper which were then put in a box and mixed. Then 45 pieces of paper were picked randomly.

4.5 DATA PROCESSING AND ANALYSIS METHODS

Data were processed manually through the evaluation of the responses on the questionnaires. Most of the data that were collected were of qualitative nature. They were analysed and the percentages of different responses were worked out and presented in tabular form.

4.6 PROBLEMS THE RESEARCHER ENCOUNTERED DURING DATA COLLECTION IN THE FIELD

The major problems that the researcher faced in the field included the following:

1. Some farmers were unwilling to release useful information to the researcher. They claimed that they were too disappointed

with the government's shrinking role in the provision of support services in the agricultural sector. To this effect, anything to do with policies of economic liberalisation was very unpopular among the farmers.

2. Inadequate finances did not only make the researcher's movement difficult from village to village but also made the researcher to be confined to only three villages.

3. The period of time in which data was being collected from the field coincided with the time when most of the farmers were preparing their fields for planting. This made it difficult for the researcher to reach the respondents, a case which necessitated him to make more than one visit in order to reach some farmers who could not be reached on the first visit. This made the task of data collection to be very tiring and time consuming.

CHAPTER FIVE

5.0 DATA PRESENTATION AND ANALYSIS

INTRODUCTION

This chapter covers the methods of cultivation that small scale farmers are practicing, the techniques that they are using to ensure high crop productivity, the duration of these techniques, the reasons for the farmers' adoption of these techniques and whether the techniques do help to enhance crop yields. Furthermore, the cultivation of crops that require less mineral fertilizers, and the production and marketing strategies of surplus produce in selected villages in Kasama district are also covered.

5.1 METHODS OF CULTIVATION

Table 1: Method of cultivation practiced in Musa, Mulanshi and Lukupa villages

CULTIVATION METHOD	NO. OF FARMERS	% OF FARMERS
Permanent	2	4.4
Semi-permanent	20	44.4
Shifting (chitemene)	2	4.4
Permanent and Semi-permanent	3	6.7
Semi-permanent and Shifting (chitemene)	16	35.6
Permanent and Shifting (chitemene)	2	4.4
TOTAL	**45**	**99.9**

Source: Field Data

NOTE: Percentage of farmers does not add up to 100% because of rounding off.

According to table 1 above 4.4% of the farmers interviewed practised permanent cultivation, 44.4% practised semi-permanent cultivation. 4.4% practised shifting (chitemene) cultivation, 6.7% practised both permanent and semi-permanent cultivation, 35.6% practised both semi-permanent and shifting (chitemene) cultivation and 4.4% practised both permanent and shifting (chitemene) cultivation.

Shifting (chitemene) cultivation, is often referred to as the dominant mode of cultivation in the northern high rainfall zones to which Kasama district is part. But according to table 1 only 4.4% of the farmers interviewed in selected villages of Kasama district practised shifting (chitemene) cultivation. Chitemene gardens, it appears, are no longer predominant and widespread. Mickels (1997) has argued that increasing population density has brought about shortened fallow periods and inadequate woodland regeneration to sustain chitemene.

According to table 1 more people 44.4% and 35.6% in the selected villages of Kasama district are involved in semi-permanent cultivation and both semi-permanent and shifting (chitemene) cultivation respectively. Among the Bemba people of Kasama semi-permanent cultivation is based on ibala or amabala. These are basically fields where cassava, sweet potatoes and other minor crops are grown. Under these fields or simply village gardens land is cleared, vegetation is uprooted and burnt and over the consequent seasons regenerated vegetative matter is turned into the soil to act as manure (Kokwe, 1997). The system may be seen as an indigenous technique

developed to cope with low inherent soil fertility and lessened forest cover.

Under semi-permanent cultivation, the local people in the selected villages of Kasama district sometimes preferred to plant their crops on flat land, rather than on the ibala or village garden. Groundnuts and sometimes beans are grown on flat land. (Mickels, 1997) observed that this type of cultivation is suitable in areas where forests have already undergone chitemene and where there is no fertilizer. This is the response of farmers to deteriorating soil fertility.

Farmers in selected villages of Kasama district also engage in continuous alternations of farming in the form of crop rotation and intercropping. Although the details of these systems are discussed in later sections, it should be mentioned that, these systems of cultivation last for long periods especially if the plots are put under fallow.

Prior to the 1990s maize growing under permanent cultivation practise was heavily supported by the government. Maize growing was attractive to smallholder farmers because of a combination of factors such as high yields, access to extra-local resources, a reliable marketing outlet and infractructure and good initial profitability due to subsidies (Mickels, 1997). Fields showing signs of becoming exhausted were revamped with chemical fertilizers and average yields of 24 – 30 ninety kilogramme bags of maize per hectare which are much higher than what was possible to achieve in any cropping system forced farmers to abandon the traditional styles of cultivation together with the traditional crops such as cassava, sweet potatoes,

sorghum and so on for the much favoured permanent cultivation practice (new cropping system) with maize as the main crop grown (Mickels, 1997 and Wood et al, 1990).

According to the findings of this study, however, only 4.4% of the farmers interviewed practised permanent cultivation. This is a very small percentage and reflects to a large extent the impact of economic liberalisation in agriculture which the government has vigorously embarked upon in the post 1990s.

5.2 USE OF CHEMICAL FERTILIZERS

According to table 2 below 35.5% of the total respondents managed to use some fertilizers in their fields while 64.4% did not manage.

Table 2: Use of chemical fertilizers among farmers in Musa, Mulanshi and Lukupa villages.

WHETHER FARMERS USER FERTILIZER	NO. OF FARMERS	% OF FARMERS
Use fertilizer	16	35.5
Do not use fertilizer	26	64.4
TOTAL	**45**	**100**

SOURCE: FIELD DATA

It should be stressed here that 35.5% in the table above represents farmers who could at least manage to source small quantities of fertilizers which some had to spread over very large maize fields in the hope that they would get some yield. Others simply used the

small quantities they could source in their home vegetable gardens. The fertilizers being talked about here is that which is sold in small one kilogramme packets at the market. Rural farmers cannot afford to buy fertilizers in large quantities in that this particular input has been made to be too expensive with the removal of government subsidies.

64.4% in the table above represents those farmers who could not afford to buy even the small one kilogramme packets of fertilizers.

Out of 35.5% farmers who at least managed to source some fertilizers 26.7% acquired them using their own funds, 4.4% by using both own funds and credit and another 4.4% by using credit only. Table 3 below shows this trend.

Table 3: Source of funds for obtaining fertilizers

SOURCE	NO. OF FARMERS	% OF FARMERS
Own funds	12	26.7
Own funds and credit	2	4.4
Credit	2	4.4
Did not use fertilizers	29	64.4
TOTAL	**45**	**99.9**

Source: Field Data

It appears that more farmers 26.7% of those who used fertilizers obtained it using their own funds. This involves use of only small quantities of fertilizers.

Only 4.4% of the farmers who used fertilizers acquired the input through credit. Small scale farmers find it very difficult to access credit either because credit facilities do not exist anywhere nearby or if at all they exist anywhere nearby cumbersome procedures that farmers should follow before they can access credit and the much demanded collatoral security by the lending institutions discourage farmers from acquiring credit.

5.3 USE OF ALTERNATIVE LOW COST TECHNIQUES OF CROP CULTIVATION

In order to ensure high crop productivity, in the face of unaffordable input prices, all the respondents that were interviewed either practised one or a combination of the following low cost techniques of crop cultivation, crop rotation, mixed cropping, fundikila or grassland system and application of animal manure. The table below shows this trend.

Table 4: Use of alternative low cost techniques of crop cultivation among the farmers in Musa, Mulanshi and Lukupa villages.

CROP CULTIVATION TECHNIQUES	NO. OF FARMERS	% OF FARMERS
A	7	15.6
B	2	4.4
F	5	11.1
AB	4	6.9
AF	15	33.3
BF	2	4.4
ABF	6	13.3
ACF	1	2.2
BCF	2	2.2
ABCF	1	4.4
TOTAL	**45**	**99.9**

SOURCE: Field Data

KEY

A - Crop rotation
B - Mixed cropping
F - Fundikila/Grassland system
C - Application of animal manure

According to table 4 above 15.6%, 4.4% and 11.1% of the farmers that were interviewed in selected villages of Kasama district practised crop rotation, mixed cropping and fundikila respectively as low cost alternative techniques of crop cultivation. 6.9% of the farmers that were interviewed preferred to combine crop rotation with mixed cropping, 33.3% preferred to combine crop rotation with fundikila,

4.4% chose to combine mixed cropping with fundikila, 13.3% combined crop rotation, mixed cropping with fundikila, 2.2% combined crop rotation, application of animal manure with fundikila. Another 2.2% combined mixed cropping, application of animal manure with fundikila and 4.4% combined crop rotation, mixed cropping, application of animal manure with fundikila.

Crop rotation under chitemene is a common crop cultivation technique in Kasama district. In the chitemene system, trees are lopped or cut and the wood is piled up on small patches within the clearing for burning. Cultivation is mostly confined to these burnt patches where the ash layer helps to overcome the inherently low soil fertility and the heat from burning helps to control weed growth. According to Schutz, (1976) chitemene system is most common in the parts of the country where annual rainfall exceeds on average 1000mm and where the soils are frequently and heavily leached. These are typical features of Kasama district which constitutes the study villages.

Arnon (1981) has argued that chitemene system is a destructive form of shifting cultivation. The farmer under this system cuts down and burns all the bushes over an area larger than the area to be planted with crops. The areas that are required to maintain a family at subsistence levels are, therefore, very large and the extensive resulting denudation of the soil accelerates erosion processes. In the villages that were covered in Kasama district, chitemene, as a system of enhancing soil fertility is gradually dying out. Longer distances to

new chitemene plots and the difficulties involved in collecting and transporting produce from these plots to the areas of residence make chitemene system unattractive to the locals. Framers have opted to replace it with crop rotation which basically involves the sequencing of cereals such as millet, sorghum and sometimes maize with legumes such as groundnuts, beans, pears and so on. Whereas cereal crops make use of nitrogen nutrients, legumes replenish the soil with nitrogen nutrients. According to table 4 above, 15.6% of the total respondents used crop rotation alone to enhance crop yields whilst 33.3% of the total respondents preferred to combine crop rotation with fundikila to increase crop yields. This shows that more of the total respondents opted to combine crop rotation with fundikila than those who simply had to rely on crop rotation alone, in selected villages of Kasama district. Cultivation technique combinations between crop rotation and other techniques other than the crop rotation – Fundikila combination were also recorded although only smaller percentages of the farmers were involved.

Mixed cropping is a characteristic of shifting cultivation. It basically involves planting together a number of crops with varying planting and harvesting times and growth habits. This way plant nutrients in different soil layers are better exploited and light energy is more effectively intercepted (Arnon, 1982). This cultivation technique gives a larger total yield than the pure stand of each crop does in aggregate. It also provides an insurance against complete failure of crops.

For example a double insurance is provided by sorghum and maize mixtures. Sorghum mainly because of its drought resistant is sown but due to its susceptibility to bird damage, it could be interplanted with maize which is much less drought resistant but unattractive to birds. When either maize or sorghum is interplanted with cassava, food security is even enhanced further. Cassava is highly productive and can be stored in the ground for up to three years, so that it needs to be harvested only when there is food crisis (Arnon, 1982). Mixed cropping, however, is utilized only to a lesser extent by the farmers that were covered in the field. This can be seen from the smaller percentage of only 4.4% of the respondents who used mixed cropping alone as a measure to enhance crop yields out of the total respondents. Smaller proportions of the farmers that were covered preferred to combined mixed cropping with other techniques also.

Fundikila or the grassland system is a popular cultivation technique in Kasama district. Under this system a grassland selected for cultivation is hoed up into mounds in such a way as to turn the grass into the centre of the moulds where it is left to rot (Allan, 1965). The grass which is incorporated into the mounds acts as manure and it is on the mounds where the cereal crops, root crops and sometimes legumes are grown. The mounds are later spread and sown and rotation involving mounding and spreading is repeated. Fundikila as a cultivation technique can either be practised single handedly or in combinations with other cultivation techniques. In table 4 above, for example, 11.1% of the farmers interviewed in Musa, Mulanshi and Lukupa villages in Kasama district used fundikila alone to enhance

their crop yields whereas 33.3% preferred to combine it with crop rotation. Other combinations involved fundikila and mixed cropping (practised by 4.4% of the total respondents) crop rotation, mixed cropping and fundikila (practised by 13.3% of the total respondents) and so on.

Use of animal manure to replenish the fertility of the soil in Kasama district is very limited. Keeping animals especially cattle has never been the tradition of the Bemba people. According to table 4 above animal manure was only used to supplement other techniques of enhancing crop yields in the selected villages in Kasama district for example 2.2% of the total respondents used it in combination with crop rotation and fundikala, another 2.2% of the total respondents used it in combination with mixed cropping and fundikila and so on.

The cultivation techniques that have been alluded to above have been adopted by the farmers in the covered villages in Kasama district as alternative measures to the use of fertilizers. The contribution of these alternative measures to high crop productivity and food security to the farmers is very limited. For one thing the respondents argued that they did not receive much help from the alternative techniques of crop cultivation in that they practised them at a time when land was already destroyed by the chemical fertilizers. When chemical fertilizers are continuously applied to acid soils of poor structure, they lead to rising acidity, declining soil structures and falling yields especially if the traditional techniques of crop cultivation are employed.

5.4 DURATION OF THE ALTERNATIVE LOW COST TECHNIQUES OF FARMING

As indicated in table 6 below 42.2% of the farmers interviewed have been making use of the alternative low cost techniques for more than ten years while 57.7% have been making use of the same techniques for less than ten years. Whereas the former case involves that farmers in Musa, Mulanshi and Lukupa villages in Kasama district who have held on to the alternative low cost techniques of farming for a relatively longer period of time and who, even when the government supported a heavily subsidised agricultural sector they still practised alternative low cost techniques of farming side by side with the modern techniques which rely on the use of inputs such as fertilizers, seeds and so on, the later case involves farmers who seem to have neglected and abandoned traditional or alternative low cost farming techniques in favour of modern techniques of farming in which chemical fertilizers could be used to revive the fertility of the soil. Government subsidies made chemical fertilizers, seeds and other inputs accessible to most of the rural farmers. The production costs of maize, a cereal crop were low and yields were high. But this was prior to the 1990s, before the liberal economic reforms were effected in the agricultural sector (Mbulo, 1990).

In the post 1990s liberal economic reforms in the agricultural sector have implied among other things the removal of subsidies on farm inputs. This has made the costs of inputs especially fertilizer to be very high. Farmers have, therefore, found themselves in a more precarious situation which has forced them to simply adopt and

intensify the once neglected and abandoned techniques of farming as the only choice for survival.

TABLE 5: Duration of the alternative low cost Techniques that farmers have adopted to ensure high crop productivity

DURATION	NO. OF FARMERS	% OF FARMERS
Over 10 years	19	42.2
Less than 10 years	26	57.7
TOTAL	**45**	**99.99**

SOURCE: Field Data.

5.5 REASONS FOR THE FARMERS USE OF ALTERNATIVE LOW COST TECHNIQUES OF CULTIVATION

According to table 6 below 87.7% of the farmers interviewed practised the alternative low cost techniques of farming because the prices of fertilizers were too high, 8.9% because they could not access or buy fertilizers anywhere nearby and 4.4% because they were simply used to the techniques.

Most of the farmers, therefore, have adopted and intensified the alternative low cost techniques of farming because the inputs (fertilizers) are unaffordable to them. Commenting on the devastating effects that the collapse of input supply had to the rural farmers in the northern parts of Zambia in 1994 Kokwe, (1997) pointed out that the whole cropping system which is based on permanent land disappeared as fertilizer became too expensive and up to 40% of the land under cultivation was rendered useless.

TABLE 6: Reasons for the farmers use of alternative low cost techniques of cultivation

REASONS	NO. OF FARMERS	% OF FARMERS
Prices of fertilizers are too high	39	86.7
Fertilizers are not accessible	4	8.9
Used to the techniques	2	4.4
TOTAL	**45**	**100**

SOURCE: Field Data

5.6 WHETHER THE ALTERNATIVE LOW COST TECHNIQUES OF FARMING INCREASE CROP YIELDS

According to table 7 below 62.2% of the farmers interviewed reported that the alternative low cost techniques of farming they have adopted and intensified help to enhance crop yields, while 37.8% reported that the techniques they have adopted and intensified did not help to increase crop yields.

TABLE 7: Alternative low cost techniques of farming and crop yields

RESULTS OF ALTERNATIVE LOW COST TECHNIQUES	NO. OF FARMERS	% OF FARMERS
Increase Crop Yields	28	62.2
Do not increase Crop Yields	17	37.8
TOTAL	**45**	**100**

SOURCE: Field Data

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Do not increase Crop Yields	17	37.8
TOTAL	**45**	**100**

SOURCE: Field Data

It appears that the majority of the farmers that were interviewed (62.2%) did see that the alternative low cost methods as important in increasing crop yields. Few farmers (37.8%) reported that they did not see the alternative low cost techniques as important in enhancing crop yields.

Kokwe (1997) argued that the ibala cultivation (similar to fundikila) is quite efficient and that cassava yields on the ibala chipya soils remain comparatively high even through long cultivation periods of up to ten years. It has been argued further that the ibala is an indigenous response to low soil fertility.

5.7 CULTIVATION OF CROPS THAT REQUIRE LESS OR NO MINERAL FERTILIZERS OTHER THAN MAIZE

The farmers that were interviewed in selected villages in Kasama district reported that they grew crops such as cassava, sweet potatoes, sorghum, millet, groundnuts, intoyo, pumpkins, cucumbers and vegetables.

The root crops cassava and sweet potatoes are principally subsistence crops in Kasama district. They generally do well on the land without use of any fertilizers. The two crops are important to the local people both as sources of starch from the roots and protein from the leaves (Schutz, 1976).

Kokwe (1997) has pointed out that farmers who had no access to fertilizers abandoned their maize fields, and tried to compensate for

the loss of maize by growing crops like cassava. The root crop cassava is a new staple food to most of the rural farmers and while some farmers used cassava mealie meal alone to make nshima others preferred to mix the crop either with sorghum or millet to produce mealie meal for nshima.

Sorghum and millet are basically subsistence crops. Although cereal crops generally depend on fertilizers, sorghum and millet perform relatively well with little use of fertilizers. In fact, sorghum in particular is able to withstand the marginal conditions of poor soils and rainfall better than other cereal crops. Sorghum and millet are very popular for village beer brewing among the rural people of Kasama district.

For groundnuts, no fertilizer is needed for the crop particularly if it is grown in an area previously occupied by a fertilized crop, though it may be necessary to apply certain fertilizers on virgin soils (Lombard, 1971). Groundnuts, when pounded and added to cassava leaves, pumpkin leaves and other vegetables make delicious recipes. Pounded groundnuts are also added to other crops such as sweet potatoes to make equally delicious meals.

Crops like intoyo, pumpkin and cucumbers are also grown and consumed by the local people in Kasama district.

The crops that have been discussed above are becoming more important to the local people in Kasama district as more of them continue to withdraw from maize cultivation a crop which has become

so costly to produce with the removal of government subsidies on farm inputs.

5.8 MAIZE CULTIVATION

According to table 8 below 40% of the farmers that were interviewed said they grew maize in the 1997/98 season while 60% said they did not grow any maize. A smaller percentage 40% of the farmers who were interviewed and who said they grew maize constitute the category of the farmers who could manage to buy anything but small quantities of fertilizer which was usually applied over large areas, in the hope that farmers would get some yield. This was a response to the removal of subsidies on inputs by government which rendered the cost of fertilizers to be too high. The majority 60% of the farmers interviewed constitute the category of farmers who had no access to fertilizers. They simply opted to abandon maize cultivation for crops that require less or no mineral fertilizers.

TABLE 8: Maize cultivation among farmers in the selected villages in Kasama district

MAIZE CULTIVATION	NO. OF FARMERS	% OF FARMERS
Grew maize	18	40
Did not grow maize	27	60
TOTAL	**45**	**100**

SOURCE: Field Data

5.9 FARMERS AND PRODUCTION OF SURPLUS

According to table 9 below 42.2% of the farmers that were covered reported that they managed to have surplus produce whilst 57.8% said that they did not manage. This shows that the percentage of the farmers who managed to have produce to spare is relatively lower than the percentage of the farmers who did not manage to have.

TABLE 9: Farmers and production of surplus in the three selected village in Kasama district.

WHETHER FARMERS HAVE SURPLUS PRODUCE	NO. OF FARMERS	% OF FARMERS
Have surplus	19	42.2
Have no surplus	26	57.8
TOTAL	**45**	**100**

SOURCE: Field Data

Out of the 42.2% farmers who managed to have surplus produce 6.7% preferred to sell it and use the money to buy goods they could not produce on the land, another 6.7% preferred to use their (produce) surplus produce to hire labour for farm activities and 28.9 preferred both to sell and use surplus produce to hire labour. Table 10 below shows this trend.

It should be pointed out that selling of the farmers' surplus produce did not only involve cash, but also exchanging their surplus produce with goods that they did not have in the form of trade called amakabu or barter system.

TABLE 10: Use of surplus produce by the farmers

USE OF SURPLUS CROP YIELDS	NO. OF FARMERS	% OF FARMERS
Sell	3	6.7
Use to hire labour	3	6.7
Sell and use to hire labour	13	28.9
Have no surplus crop yields	26	57.8
TOTAL	**45**	**100**

SOURCE: Field Data

5.10 MARKET FOR THE FARMERS SURPLUS PRODUCE

According to table 11 below all the 35.6% of the farmers who had some surplus produce for sale sold it to individual persons. 64% represents those farmers who did not manage to have any surplus produce and those who did manage but only preferred to use the surplus for purposes other than selling (i.e. used to hire labour only).

TABLE 11: Market for the farmers surplus produce

MARKET FOR SURPLUS PRODUCE	NO. OF FARMERS	% OF FARMERS
Individual persons	16	35.6
Did not have surplus produce/Did not sell	29	64.4
TOTAL	**45**	**100**

SOURCE: Field Data

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION

The structural adjustment programme as implemented in Zambia beginning from the early 1990s in the rural areas principally took the form of sudden shocks. It implied sudden changes in the market and the organisation of the agricultural services without much prior communication nor explanations. The farmers in rural areas had to forget about the government as a provider of support services in their farm activities. They, instead, had to deal with the private sector which was in fact not ready to take over service functions. Private traders wherever they existed preferred to buy maize and not the traditional crops such as cassava, millet, sorghum and so on. They also failed to take on input supply due to high transport, storage and handling costs and small profits. Credit also shrunk considerably as the major lending institutions got liquidated. The removal of subsidies increased the price of fertilizers and made this input unaffordable to most of the rural farmers.

In the selected villages in Kasama district farmers had to adjust to the uncertain and precarious situation in which they had found themselves. Those who could manage to acquire small quantities of fertilizers, they had to spread this input over large maize fields in the hope that they would have some yield. In non-maize fields and in order to obtain good crop yields almost all the farmers, immediately

had to turn to the use of indigenous and alternative low cost techniques of crop cultivation. These techniques included crop rotation, mixed cropping, fundikila and application of animal manure. Farmers either practised one of these techniques or a combination of them. These techniques are of semi-permanent nature and some of them like fundikila last for longer periods of time especially if some periods of fallow are also observed.

Farmers also preferred to grow crops like cassava, sweet potatoes, sorghum, groundnuts and so on in response to the loss of fertilizers. These crops need little or no use of fertilizers and as such they have replaced maize, a crop which relies heavily on fertilizer.

With regard to the marketing of crops, the so called private agents are non existent in the eyes of the rural farmers in the selected villages in Kasama district. Private agents are more confined within the town area of Kasama district. The inherently low yields among the rural farmers and inaccessibility of some rural areas discourage private agents from trading with the rural farmers. The response to this situation by the farmers has involved selling of their surplus produce not to the private agents but to individual customers at local markets. Surplus produce was usually in small quantities and farmers had to transport, negotiate prices and sell their produce personally. Sometimes the individual buyers had to follow the farmers to their homes where trade transactions took place. Produce was either exchanged for cash or for goods farmers did not own.

On the whole farmers in the selected villages in Kasama district have come to find themselves in a tricky situation and although they are making use of alternative low cost techniques of crop cultivation and although they are cultivating crops that require less or no mineral fertilizers as compensatory measures, these adjustments do very little to compensate for the loss of fertilizers and the cultivation of maize which offered them high yields. The techniques the farmers are making use of, could only make most of them have just some food for survival. Farmers failed to have large quantities of surplus produce. These alternative low cost techniques of crop cultivation were being practiced on the soils that were made to be too dependent on chemical fertilizers. Crops on such soils rarely perform well. Besides, the techniques the farmers have adopted and intensified place too much value on the cultivation of traditional crops that are less important in the formal markets. This has made it increasingly difficult for the rural farmers to raise the much needed cash for their children's school fees and uniforms and health care expenses.

The rural farmers in the liberalised economy will remain isolated from the entire national economy, unless and until measures that seek to incorporate their cultivation techniques, crop preferences and their entire ways of life into the national economy are put in place.

6.1 RECOMMENDATIONS

With the on set of economic liberalisation beginning after the 1990s rural farmers have faced government marginalisation even fruther.

There are certain things that can be done, however in order to make the operations of the rural small scale farmers viable. They include the following:

1. There is need for the government and private agencies to begin and intensify research on how to come up with improved varieties of traditional crops such as millet, sorghum, cassava and so on. The improved varieties should be early maturing varieties and adaptable to the local environments. It is very retrogressive for the local people to keep relying on the indigenous varieties some of which take too long to mature. For example, the existing local cassava varieties take on average 2.3 years before they can be ready for haversting.

2. If the remote areas are ever going to be attractive to the private agencies, a deliberate policy should be put in which should be directed towards the maintenance of rural roads and bridges. Bad roads which are usually impassable during the rain season make rural areas unattractive to the private agencies. This does not only disturb the flow of inputs to these areas but also the flow of produce to the market.

3. The participation of the rural farmers in the national economy depends to a large extent also on how organised the rural markets are. Generally rural markets are not well organised, essential facilities are always lacking resulting in unhygenic conditions. In some places local markets are infact, non

existent and this has devastating effects on the farmers who would like to trade. It is important, therefore, that convenient and well serviced sites are established in rural areas where buyers and sellers can meet to conduct their business.

4. Ineffective spreading of information on new developments in the agricultural sector has had devastating effects on the operations of the rural farmers. In certain instances rural farmers were unaware that credit could be obtained from private agencies, and worse still some rural farmers preferred to wait patiently hoping that inputs from the government would be fourth coming even after liberal economic reforms had been effected. There is, therefore, need for both the government and the private agencies to open appropriate channels of communication which would enable rural farmers to get the information that they need in order to make their farm operations viable.

6.1 SUGGESTION FOR FUTURE RESEARCH

Private agencies appear to be non existent or ineffective in the eyes of the rural farmers. An investigation of the factors that are hindering the participation of the private agencies in the marketing of inputs and produce should be carried out.

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APPENDIX 1

QUESTIONNAIRE FOR THE FARMER

1. Age .....

2. Sex: Male..... Female .....

3. Total number of household members .....

USE OF ALTERNATIVE LOW INPUT TECHNIQUES OF CROP CULTIVATION

4. What type/types of cultivation do you practice?
   a. Permanent cultivation
   b. Semi permanent cultivation
   c. Shifting (chitemene) cultivation

5. Do you apply any fertilizers in the fields?
   Yes ..... No.....

6. If the answer is YES to question 5 how do you acquire fertilizer?
   a. Own financing
   b. Credit
   c. Other specify .....

7. What other techniques do you use in order to ensure high crop productivity?
   a. Crop rotation
   b. Mixed cropping
   c. Application of animal manure
   d. Use of legumes to restore soil fertility
   e. Others specify .....

8. For how long have you been using the techniques(s) mentioned in question 7?

   a. For over 10 years

   b. For less than 10 years

9. Why do you use the techniques in question 7.

   a. Prices of fertilizers are too high

   b. Nowwhere nearby to buy fertilizers

   c. Other reasons (specify)

10. Do you have a problem of weeds and pests?

    Yes ..... No .....

11. If YES to question 10 how do you deal with them?

    .....

12. Do the techniques you use to promote soil fertility help to enhance crop yields?

    YES..... NO.....

Crops Small Scale farmers are cultivating that require low mineral fertilizer and other inputs other than maize.

13. What types of crops do you cultivate other than maize that require low inputs (fertilizer and seed)?

    a. Millet

    b. Cassava

    c. Rice

    d. Sweet Potatoes

    e. Vegetables

f. Beans

g. Others (specify)

14. How many kilogrammes of each of the crops you have mentioned in question 13 do you produce per year? .....

15. How much area is allocated to each of the crops? .....

16. For how long have you been cultivating the crops you grow?

a. For over 10 years

b. For less than 5 years

17. Do you grow maize. YES ..... NO .....

18. If YES to question 17 do you use any inputs (fertilizers or seed)
YES ..... NO .....

19. If YES to question 18 how do you acquire the inputs?
a. Own financing
b. Credit
c. Other (specify)

20. If NO to question 18 why?

a. Inputs are expensive

b. Inputs cannot be found nearby

c. Other (specify)

21. How much money do you realise from crops that you grow annually?
.....

Strategies and techniques Small Scale Farmers are using to market their surplus produce.

22. Do you produce any surplus produce?

    YES ..... NO .....

23. If YES to question 22 what do you do with surplus produce?

    a. Sell

    b. Used to hire labour for farm activities (ploughing, weeding, harvesting, etc.)

    c. Other (specify)

24. If NO to question 22 why .....

25. If you sell your surplus produce specify where you sell

    a. Food Storage Agency

    b. Private Agencies

    c. Individual persons

26. Who provides the storage facilities for your surplus produce?

    a. Self

    b. Any other specify

27. Are there any local organisations that local people have formed to help in the marketing of surplus produce?

    YES ..... NO .....

28. If YES to question 24 specify the name of the organisation.

29. Now that the government has specified that you are free to sell your produce including maize to any buyer and that you can fix your own prices, has this arrangement helped you in any way?
YES..... NO .....

30. If YES to question 25 how? .....
If NO to question 25 how? .....

31. What do you think the government should do to help you in a liberalised system?

.....

.....

APPENDIX 2

INTERVIEW GUIDE FOR THE AGRICULTURAL OFFICERS

USE OF ALTERNATIVE LOW INPUT TECHNIQUES OF CROP CULTIVATION BY SMALL SCALE FARMERS

1. Do you think that the removal of subsidies by the government has affected the operations of the Small Scale farmers? .....
2. What do you think is the farmers response to governments removal of subsidies on farm inputs? .....
3. Are small scale farmers making use of any alternative low input techniques of crop cultivation? .....
4. Do you think that the techniques that farmers are using are suitable to the environment? .....
5. Do you think that these techniques are reliable and sustainable? .....
6. Do you think that the low input techniques that small scale farmers are using or have adopted represent their response to other liberal economic principles that the government has put in place? .....

CULTIVATING CROPS OTHER THAN MAIZE THAT REQUIRE LESS MINERAL FERTILIZER AND OTHER INPUTS

7. Do you think that small scale farmers are selectively cultivating crops other than maize that require less mineral fertilizer and other inputs? .....

8. How many people got involved in maize cultivation in the 1997/1998 season? .....

9. How does this compare with those who cultivated maize in the 1991/92 season? .....

10. Do you think there is an increase in the number of farmers who are cultivating maize? .....

11. According to the information that you obtain from small scale farmers has the consumption or use of inputs like fertilizer and seed decreased or increased?.....

.....

12. What could be attributed to the above situation?

.....

13. Do you think the crops that small scale farmers are growing (crops that require less mineral fertilizers and other inputs) are helping the farmers as a source of food and income? .....

TECHNIQUES AND STRATEGIES THAT SMALL SCALE FARMERS ARE USING TO MARKET THEIR SURPLUS PRODUCE

14. Do the farming techniques and crops adopted by the farmers enable them to have surplus produce? .....

15. How do farmers market their surplus produce? .....

.....

16. Are there any organisations that farmers have locally formed to help in the marketing of their surplus produce? .....

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17. Do you think that the introduction of more liberal economic principles in Zambia is helping small scale farmers in their operations? .....

18. How helpful are the private agencies in facilitating farmers' operations? .....

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19. What are the problems that farmers are facing?

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20. What should the government do in order to make the operations of the farmers more viable?

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