WOMEN'S ACCESS TO LAND AND ITS EFFECT ON THEIR AGRICULTURAL PRODUCTIVITY

A case study of Monze District, Zambia.

BY

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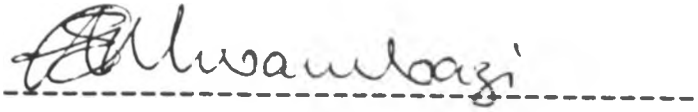
DECLARATION

This thesis is my original work and has not been presented for a degree in any other University.



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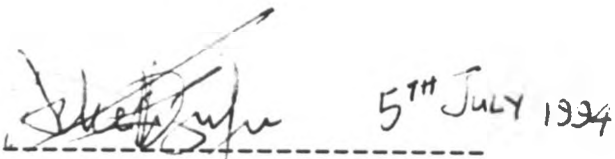

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ABSTRACT

In view of the emphasis given to improving women's agricultural production in the Fourth National Development Plan of Zambia, the main objective of the study was to determine whether women's agricultural productivity is affected by the amount of land they have access to and the type of tenure security they exercise over it. The other major objective was to find out whether the amount of land women have access to differs according to their marital status or gender of head of household. Other objectives were to establish the relationship between women's involvement in cash crop production and the amount of land they have access to and whether their marital status had any effect on their productivity.

Research work was carried out in Monze District of the Southern Province, Zambia. A sample of 100 women were interviewed about their access to land and their tenure security, their agricultural production, access to extension, level of education and decision making power.

The analysis involved calculations of percentages, means of subsamples and regression coefficients. The findings reveal that different types of women have access to different amounts of land and that their agricultural productivity also differs. Married women were found to have access to the least amount of land (2.15ha) while widows had access to the highest amount of land (4.85ha). On the other hand, married women were shown to have the highest agricultural productivity (K6298/ha) and widows the lowest (K4891/ha). The study has therefore concluded that the poor

productivity of widows and other women in female headed households is not caused by their having access to less land but by other factors like the level of input use and availability of family labour. It was also concluded that it is the limited amount of land accessible to married women which constrains their total production.

The findings in the study reveal that decision making power is also important in increasing women's productivity. The study could not, however, show any relationship between women's land tenure security and their productivity.

Findings in the study showed that women involved in cash crop production have access to more land (4.34ha) compared to women not involved in cash crop production (1.78ha). The study has not shown that women in customary land are better-off in terms of access to land compared to women in other land tenure systems. It, however, revealed that older women, women in smaller households and those in households with larger land areas have access to more land.

In general, the study indicated that different types of women face different problems in their agricultural activities. Hence, in order to improve the productivity and total agricultural production for different types of women, their problems should be addressed by the relevant authorities differently.

CHAPTER ONE

INTRODUCTION TO THE STUDY

1.1 GENERAL INTRODUCTION TO ZAMBIA

Zambia was, in comparison with other African countries, a prosperous middle income economy in the 1960's and 1970's. At independence in 1964 Zambia enjoyed a relatively high standard of living and a reasonably safe food security situation. Gross National Product [GNP] per capita was over US $500 with an annual rate of inflation of less than 5 per cent [FAO,1991]. Daily per capita calorie availability was about 2100. Malnutrition, undernutrition , persistent hunger and its attendant diseases were reportedly infrequent. By 1990 GNP per capita had dropped to US $ 250 and inflation exceeded 100 per cent. Per capita calorie availability had dropped to less than 2000 a day, reflecting a trend decline in food production since 1980 (FAO,1991).

Past economic performance in Zambia has been dominated by two major factors;

i) the performance of the copper sub-sector, and

ii) a socio- political philosophy weighted in favour of urban consumers.

The copper sub- sector has been in decline since the collapse of world market prices for copper in the mid-seventies. Between 1964 and 1970, on average, the copper industry contributed 44 per cent of the Gross Domestic Product (GDP), 59 per cent of the government revenue and 95 per cent of exports. Between 1971 and

1981 the copper industry average contributions continued to fall to 20 per cent of GDP, 16 per cent of government revenue and 93 per cent of exports (Mbewe, 1990). By 1980, manufacturing (19 per cent), public service (18 per cent) and agriculture, forestry and fishing (15 per cent) were altogether more important than mining (FAO,1990).

Agriculture's share of GDP in real terms grew from 15 per cent in 1980 to 19 per cent in 1988 (FAO, 1990). However, agriculture is still far from realising its full potential as the new " engine of growth" for the Zambian economy. This is because despite the decrease in the importance of copper it still constitutes the highest percentage of the country's exports. The decline in both volume and value of mineral exports without compensating increases in other sectors, has led to a serious foreign exchange crisis and caused the country to fall deeper and deeper into debt. For example, Zambia's external debt increased from US $ 5.73 billion in 1986 to US $6.87 billion in 1990 (Bardouille, 1991). Real GDP growth declined from 0.7 per cent in 1986 to -2.0 per cent in 1990 and consumer price index (for low income) rose sharply from 51.6 per cent in 1986 to 124.6 per cent in 1990 (Bardouille, 1991).

As a result of the economic crisis as shown by the indicators above, the Zambian Government has recognised that the agricultural sector has a crucial role to play in effecting the structural transformation of the economy. It has also recognised that the answer to national development through agricultural

development lies mainly in human resource development. In the face of serious financial constraints the nation needs to tap all inputs of every human resource, and that includes women (Zambia, 1989).

1.2 ZAMBIA'S AGRICULTURAL SECTOR

At independence, Zambia inherited an economy almost entirely dependent on the copper mining industry together with a very underdeveloped agricultural sector. For example, in 1970 the mining sector contributed 40.9 percent of the GDP, whereas the agricultural sector contributed only 6.9 percent. During the same period the value of exports from the mining sector amounted to 98.5 percent while the value of exports from the agricultural sector was only 0.5 percent. Even in terms of wages for African workers, the mining sector still showed its superiority. African workers in the mining sector earned an average of Zambian Kwacha (K) 1453 as compared to K348 earned by agricultural workers (Himonga et al,1988). All these showed how much the country depended on the mining sector and which proved to be detrimental to the country's economy when the copper prices collapsed in the mid seventies.

In order to diversify the economy from copper, thus reducing the dominance of copper as the largest employer of labour and foreign exchange earner, the First National Development Plan (1966-1972) placed emphasis on agricultural and rural development. Under this plan agriculture was to play a key role in the country's import substitution policy through increased production of raw

materials for manufacturing industries. Rural development was also to be achieved through increased production.

In general, Zambia's agricultural policies have been guided by the principle of self sufficiency particularly in the staple food crop, maize,in order to reduce food imports.

The policies have also aimed at reducing the dominance of non African farmers over the commercial agricultural sector in particular in the production of maize. It was believed that increased agricultural production by Zambians would lead to raising of the standard of living of the masses who are engaged in agriculture. Increased agricultural production would also narrow the income gap between town and country dwellers. In this respect the government has also sought to encourage agricultural production units other than large scale commercial farming dominated mainly by European farmers, farming companies and state farms (Himonga et al, 1988).

Through the recognition of the importance of the agricultural sector in the development plans formulated after independence, Zambian agriculture has performed well over the past one decade. This was principally but not entirely due to improvements in maize production during the period 1984-1989 (FAO, 1991).

Table 1.1 Population and Agricultural Production Indices

1979-1981=100

YEAR	POPULATION	FOOD AND AGRICULTURAL PRODUCTION	FOOD PRODUCTION	PER CAPUT FOOD PROD.
1980	100	102.5	102.4	102.5
1981	103	100.4	100.3	99.6
1982	107	97.5	98.2	91.0
1983	111	99.8	99.7	88.9
1984	114	106.5	104.5	89.4
1985	120	115.0	114.1	93.5
1986	123	120.7	119.5	94.1
1987	129	122.5	119.3	90.1
1988	132	146.4	144.2	105.1
1989	136	147.3	144.7	101.8
1990	139	135.0	130.0	88.0

Source: Food and Agricultural Organisation (FAO), 1991.

Table 1.1 shows that food and agricultural production had increased by nearly 50 per cent in 1989 compared to the 1979-81 base period average. Per caput food production had declined, however, except for 1988 and 1989, when there was an exceptionally good weather.

Despite the considerable increase in agricultural production, Zambia is still very far from realizing its full agricultural potential to offset the economic crisis caused by the

collapse of the copper sub-sector. The realization of the potential has been constrained by a combination of factors. These include the rural urban drift which has changed the structure of the rural population leaving the rural areas with more females than males. Also contributing to the slow increase in agricultural production is the low level of technology, irregular or inadequate supply of modern inputs and state intervention in the pricing and marketing of major agricultural produce. Among the not so often mentioned factors is the marginalised role of women in Agriculture. Since most of the tropical countries in Africa, Zambia inclusive, are trying to improve the agricultural situation by reversing some of the adverse policies, it is imperative to ask ourselves whether, with 25-35 per cent of the smallholder farmers being female heads of households (Due et al,1991), they do not need specific agricultural policies to assist them.

1.3 WOMEN IN THE AGRICULTURAL SECTOR

In the 1990 census the population of Zambia was recorded as 7.82 million of which 3.98 million (50.8 percent) were females and 3.84 million (49.2 percent) were males (Zambia,1990). Compared to the 1980 census figure of 5.67 million, it shows an increase of population of 2.1 million persons in ten years implying an average growth rate of 3.2 percent.

The same 1990 census showed that rural areas account for 58 percent of the population while urban areas account for 42

percent. This makes Zambia the third most urbanised country in Africa after Algeria and South Africa (Hurlich, 1986). Out of the total rural population of 4,532,681, 2,335,447 (51.5 percent) were females and 2,197,234 (48.5 percent) were males (Zambia, 1990). Hence, a higher proportion of the female compared to the male population lives in the rural areas.

Table 1.2 Subsistence Farming by Province, 1986

PROVINCE	WOMEN		MEN		% WITHIN AREA	
	NUMBER (100)	%	NUMBER (100)	%	WOMEN	MEN
Northern	1,688	23	1,161	20	59	41
Eastern	1,452	20	1,262	22	54	46
Western	1,055	15	649	11	62	38
Southern	746	10	657	12	53	47
Central	540	8	652	11	46	54
Luapula	606	8	421	7	59	41
North West	548	8	420	7	57	43
Copperbelt	472	6	423	8	53	47
Lusaka	173	2	160	3	52	48
TOTAL	7,287	100	5,804	100	56	44

Source: Zambia, Republic of. 1991.

Rural women in Zambia are not different from the other women in the Sub- Saharan Africa. The majority of them are small subsistence farmers. In Zambia there are more women working as subsistence farmers in all provinces, except for Central Province, as substantiated by Table 1.2 above. Given that productivity and earnings are lower for subsistence farmers than other occupations, this implies that more women than men live under extreme poverty (Zambia, 1991).

Rural women have two major responsibilities agriculturally, the first being household food production. Estimates indicate that women produce 60 to 70 percent of the food in tropical Africa and that this high proportion is achieved through high female labour inputs rather than female land ownership(Due, 1987). In Zambia, women are said to contribute 80 percent of the necessary labour in food crop production (Zambia, 1989). The second responsibility is production of cash crops for the market, to which Zambian women contribute more than 50 percent of the labour input (Zambia, 1989). In addition to their agricultural production activities, women also participate in wage labour, non-farm income generating activities as well as reproductive processes. These and other activities keep them busy from dawn to dusk.

Due to a variety of circumstances, including the rapid rural urban migration of men in the mid 60's, women are also increasingly assuming major responsibilities as heads of households. In 1980, some 33 percent of households in

Zambia were headed by women and in some rural areas, female headed households account for 50 percent of the households(Safilios-Rothschild, 1985). Although the role of women in agriculture is increasingly being recognised and appreciated their full integration in the development process is yet to be achieved. The Fourth National Development Plan (FNDP) of 1989 outlines a strategy for women in agriculture and other sectors. The objective of the overall strategy for women is to "ensure that women are participants and beneficiaries of development and to ensure their increased integration in development by stipulating forms and levels of women's participation in the development process" (Zambia,1989).The long term and short term objectives of women in agriculture are to:

(a) increase recognition of the importance of women's roles in food production for achieving rural household food security and nutritional welfare.

(b) increase participation of and benefit for women from all services and resources devoted to the improvement of cash crop production among small scale farmers;

(c) increase smallholder production through the alleviation of women's farm and domestic work burdens.

Increasing women's access to land rights and extension was identified as one of the ways of implementing the stated objectives (Zambia, 1989).

It has been acknowledged that commercial farmers had benefited more than smallholder farmers in the past policies, and

women ,especially women in female headed households had benefited least. Milimo (1990) in his study of 648 Zambian farm households showed that women are disadvantaged in terms of access to productive resources such as land, labour, credit and agricultural training. This means that women are only playing a limited role in the development of Zambia.

1.4 LAND TENURE PRACTICES AND GENDER ISSUES

The term "land tenure" refers to the system of rules and practices under which persons exercise and enjoy rights in land or objects fixed immovably to land such as houses (Himonga et al, 1988).

Zambia has a dual tenure system established by the various orders-in-council during the colonial period and continued into force after independence. The two systems of land tenure are designated "statutory tenure" and "customary tenure" to distinguish the law applicable.

Under the orders-in-council land is divided into three categories:-

(a) Stateland: this consists of mostly land in urban areas, along the line of rail, rich in mineral deposits, which is available for economic development by non-Africans. The tenure applicable here is statutory tenure which comprises:-

1. English Land Law as it was on the 17th August, 1911 subject to the provisions of the Orders-in-Council and to any other law (CAP 41).

2. Legislation passed by both Northern Rhodesian and Zambian Parliaments.

Land rights can only be obtained and enjoyed by individuals in this category by the grant from the President. Leases of up to 100 years duration may be granted. The distinguishing feature of this type of tenure is that the government controls occupation and use of the land (Himonga et al, 1988.)

(b) Reserves and (c) Trust Land

Most of the land in Zambia is traditional or reserve land, which belongs to the community living on it. It is vested in traditional rulers who are its custodians. Individuals have a right to land in accordance to customary law, and everyone is supposed to have a right to land. The community chief approves an individual's application for land which then remains in the family for generations. Although individuals do not own land, they have usufruct rights over it and relatively secure tenure (Katongo, 1990). Land legislation does not in general apply. However, the Orders-in-Council empower the President to make grants and dispositions of land after consulting the Rural Council and the Chief within whose area the land is situated (Himonga, et al, 1988).

1.4.1 Patterns of land acquisition

The right to acquire rights over land rests in the individuals by reason of their being residents in a given area within which they exercise these rights of acquisition. An individual may acquire a parcel of land in any one of the following ways:-

(a) Direct acquisition: an individual opens and uses a parcel of land over which no individual has already prior established rights, or in which any established rights have already lapsed or have been abandoned. This is common in underpopulated areas, where agriculture is still undeveloped and where there has been little commercialisation of land.

(b) Transfer inter Vivos: an individual who has already acquired rights over a parcel of land may transfer these rights to another through sale, by way of loan and by outright transfer by way of gift or exchange.

(c) Transmission and Succession: If a land holder dies, a relative may take over part or all of his land if he so wishes, or land may be divided between more than one relative.

The last two methods are prevalent in areas where stable agriculture is practised, land is in short supply and where land has been commercialised by the development of cash crops in larger acreages (Zambia,1967).

Studies reveal that there is no machinery for allocating land under customary law. Acquisition of rights to land depends on the individuals residence. Chiefs and headmen exercise political

control but they do not allocate land. The Chief or headman has regulatory role. For example, a stranger to the area needs the chief's permission to settle in the area before acquiring a piece of land (Himonga et al, 1988).

1.4.2. Women's rights to land

Access to land by women differs from one ethnic group to another. Women had usufruct rights generally, following the same system as inheritance, that is, through the mother's line (matrilineal), the father's line (patrilineal) or both (bilateral).

The Tonga of the Southern Province and the Bemba of Northern Province, are among the groups in Zambia that practice matrilineal system of inheritance. Despite the fact that women have important rights to land in matrilineal societies, there are still certain practices which are biased against them. For instance, on the one hand a Tonga widow can remain independent and live in the village of her marriage, and even retain rights to her piece of land allocated to by her late husband. On the other hand, preference for inheritance often follows the male line , that is, land might go to the mother's nephew if she herself does not have a son. Or the widow might in some cases be inherited by the surviving brother along with the land. The latter is called "leverage" and is still practised by the Tonga (Kanyangwa and Muntemba, 1985).

The Ngoni of the Eastern Province are among the patrilineal societies in Zambia. Among these societies it is the

oldest son who may inherit the land. In a polygynous household, the land usually goes to the eldest son of the first wife. It is only when there are no sons that the eldest daughter may inherit the land. The Ngoni widow may also hold to the garden given to her by her husband, for as long as she lives.

The Lozi of Western Province are among the societies which practice bilateral inheritance, where either man or woman may inherit land. Again, however, preference often goes to males, as it is usually the eldest son of the deceased who does the distribution. The Lozi widow is not the automatic heir of her husband's land and will often return to the homestead of her birth where she has a legal claim on her male relatives for land. In some instances she may keep the land allocated to her by her husband and remain as custodian of minor children.

In some societies, young single women, including divorced women, often live with their parents or matrikin and work on the "family fields". In addition, they may be given a small plot of their own. But although they can establish their own households when they want, the fact that they can call on little labour but their own is a major obstacle to doing so (Safilios-Rothschild, 1985) Although women's access to land varies in the systems outlined above, the common feature is that the laws of inheritance, ownership and control of land tend to discriminate against women. Rights to agricultural land favour men on the assumption that the man is always head of the family (Hurlich, 1986).

Due (1991) comments that women have no secure rights to

land under customary law. They receive access to land through their husbands or if single their male relatives. However, as Milimo (1990) explains, due to lineage system, property used (land) by one individual during his or her lifetime is taken over at death by his or her patri- or matrikin group. Since husband and wife usually belong to different kin groups the system makes women more insecure where land is concerned.

Apart from the insecurity, women's rights to land seem to have been further eroded by colonial experience (Safilios-Rothschild, 1985). Colson (1966) in her study of the valley Tonga in 1960 documented some significant ways that have caused this erosion. Traditionally, Tonga women had rights over produce and controlled what they grew in their fields if the plot belonged to them. Once oxen and ploughs, considered as man's property, were brought in women began to lose their rights as men claimed part of the produce as payment. Also the expansion of cash crop production has encouraged privatisation of land hence causing more women to lose their traditional land rights and become more and more dependent on their husbands (Phiri, 1989).

Family settlement schemes have further marginalised women as land registration is mainly done in the names of male heads of households,with no recognition given to women's traditional rights to land.

Table 1.3 Number of Male and Female Farmers in Selected Settlements in Zambia

Settlement	Farm Owners			
	Male	Female	Joint	Total
Chitina	45	4	-	49
Big Concession	68	2	-	70
Lubombo	63	2	-	65
Lukulu North	74	-	-	74
Lusaka	101	9	5	115
Milombwe	117	1	-	118
Mumba	53	5	-	58
Mungwi	114	6	-	150
Nqwezi	128	2	-	130
Totals	793	31	5	829
Percent	95.7	3.7	0.6	100

Source: C.M.Himonga, M.Munachonga and A. Chanda (1988). Lusaka.

Table 1.4 Allocation of Settlement Parcels in Monze District as at January 18, 1993.

SETTLEMENT	TOTAL PARCELS	MEN	WOMEN
Silwili	48	48	0
Kazungula	39	39	0
Hufwa	11	11	0
Muyobe	14	14	0
Kayuni	38	38	0
Magoye	28	28	0
Kaumuzya	14	14	0
Namilongwe	89	86	3
TOTAL	281	278	3

Source: Compiled from information provided by Mr. R.M. Mundia, Land Use Planning Officer, Monze District.

Table 1.3 shows the numbers and percentages of settlement land parcels allocated to women in Zambia to be only about 3.7 percent. This percentage is even lower when considering the land parcels allocated to women in Monze District as at January 18,1993, as shown in Table 1.4.

1.5 THE PROBLEM

According to the Dictionary of English Law, " access" is defined as approach or the means of approaching something, in this case land. Control, on the other hand, means the general suprintendence of matters relating to supervision, protection and control (United Nations, 1989).

Given these definitions, the issue therefore is whether rural women have or are given the means, directly or indirectly, to acquire and use land for agricultural production and whether within the existing practice, they do exercise general suprintendence, supervision and control over land and how such access and control affect the returns from it.

It is evident from the survey of the statutory law in Zambia, that both men and women have equal rights and therefore should have equal access to land. The customary laws of most traditional societies may, however, be said to deny women ownership rights by not allowing them to inherit land from their husbands, families or having land allocated to them in their own right. It is true, however, to say women in customary law usually have usufructory rights to family plots and within this context could be said to have reasonable access but limited control over land.

While availability of agricultural land is not as yet said to be a problem in most parts of Zambia, the Southern Province Land Commission Report of 1982 has shown that this has become an

issue in the province (Himonga et al, 1988). This could be attributed to the increasing growth in rural population. In addition, the problem of land in the Southern province could be attributed to the 20th Century land developments in the railway region of Zambia. As land becomes more valuable, a situation brought about by increased cash crop production, traditional inheritance customs begin to break down and women, especially widows, are often left landless or with small plots of poor quality (Safilios- Rothschild, 1985). Also, some government programmes that have been implemented have led to the redistribution of land. This has brought about changes in the land tenure system and affected women's access to, and control over, land. Kanyangwa and Muntemba (1985) give an example of what happened to the valley Tonga after resettlement. Before resettlement Tonga women owned land from lineage landers and they had disposal rights for that land. Women have lost this right to land after resettlement as land was allocated to individuals, usually male heads of households and not for the lineage control.

Settlement schemes, introduced by the government to increase access to land by small scale farmers seem to have had adverse effects on women's access to, and control over land. They have had three main disadvantages to women. First of all, very few women, (one percent in the case of Monze District), are allocated with land. This means female heads of households are rarely allocated with such parcels of land. Secondly, though in some settlement schemes like Magoye Family Farms, farmers can grow any

crop they want, some schemes like the Kaleya Smallholder Scheme for sugarcane in Mazabuka are crop specific. Thirdly, some settlement schemes do not offer secure tenure for example where the death of the husband does not mean that the family can automatically take over the land hence leaving the widow landless (Katongo, 1991).

The issues raised above show that despite the big role played by women in both food production and food security as well as in cash crop production, they do not have easy access to land nor do they have enough control over land. This could have a direct bearing on women's agricultural production and productivity as well as the nation's agricultural development as a whole.

1.6 JUSTIFICATION

Since "Women in Development" is a relatively new field the development literature has not sufficiently addressed the issue of access to resources and technology by different categories of women and their production in agriculture. While a number of studies have shown the particularly disadvantaged situation of female headed households (Chileya, 1990; Keller and Phiri, 1986) no study has, however, been carried out to find the effect of the limited access to resources, particularly land, by different categories of women on their agricultural production. This study is carried out to find out exactly the amount of land accessible to married women, unmarried women, divorced women and widows. It also

enquires as to whether the amount of land accessible to women has any effect on their total agricultural production and productivity.

Along with land, this study looks at the effect of the type of land tenure security women have, their marital status and level of decision making power, all of which are hypothesized to affect women's agricultural productivity.

This study of women's access to land and its effect on their agricultural production and productivity is justified by the following reasons:-

(a) Women constitute a large proportion of Zambia's small scale farmers and therefore are an important part of agricultural development (ZARD,1985).

(b) The country's improvement in agricultural production cannot be achieved unless farmers, including women, are given the essential resources to increase their productivity. This study will investigate the neccessity of formulating policies which will increase women's access to agricultural land and their control over it.

(c) Through the Fourth National Development Plan, the government has a policy of integrating women in development (Zambia,1989).

It is hoped that this study will be of valuable use to policy makers and planners when considering ways of increasing agricultural production and income of different categories of women in an effort to improve their welfare.

1.7 OBJECTIVES OF THE STUDY

The general objective of the study is to determine the effect of women's access to, and control over, land on their agricultural productivity and to analyze the factors that influence the amount of land accessible to a woman.

The specific objectives of the study are:-

1. to examine the amount of agricultural land accessible to women of different categories according to marital status, gender of head of household and type of land
2. to assess the effect of the amount of agricultural land the woman has access to on her agricultural productivity
3. to examine the relationship between the type of tenure security and women's agricultural production and productivity
4. to examine the relationship between the amount of agricultural land women have access to and their involvement in cash crop production.

1.8 HYPOTHESES OF THE STUDY

The following hypotheses will be tested:-

1. that women's agricultural productivity is not affected by the amount of land they have access to
2. that women's agricultural productivity does not depend on the type of tenure security applying on the land they have access to
3. that there is no difference in the amount of agricultural land accessible to women of different marital status

4. that women in settlement schemes have access to equal amount of land as those on customary land

5. that there is no relationship between the amount of land accessible to women and their production of cash crops.

CHAPTER TWO

LITERATURE REVIEW

2.1 THE GENDER ISSUE

In Africa, where primary production still holds the key to economic development, access to productive assets, especially land, is the most important determinant of welfare and income distribution.

The amount and quantity of land and the legal and other conditions under which it is held and passed on from one generation to another greatly affect production. Secure land tenure opens the way to increased short- and long term investment, contributes to conservation of the soil and provides optimum conditions for maximizing production.

In Sub- Saharan Africa women constitute over 50 per cent of the small scale farmers who are the backbone of Africa's food and agricultural sector. In the case of Zambia, women constitute 56 per cent of subsistence farmers (Zambia, 1991). These women farmers provide as much as 80 percent of the labour to food production, processing and local trading (U.N., 1989).Hence achievement of overall agricultural development and improvement in household food security requires that women be provided with the necessary resources ,land being one of them. Ironically, however, women are said to lack access to the same resources which are a necessity for agricultural development.Recent literature on rural development in

Africa seems to increasingly suggest that many of the agricultural development policies pursued by African countries have in many ways marginalised women and jeopardised food production (U.N., 1989).

As concerns women's access to land, the U.N.(1989) report shows that statutory laws governing the rights and relationships between individuals in the use and control of land and its resources contain no provisions which are intended to disposses women of their ownership of land or disqualify them from obtaining access to land. However, difficulties of interpretation and administration of these legal codes, ignorance on the part of rural women regarding their rights in land and discriminatory practices based on customary and religious laws prevent women from claiming their rights and managing their land. The report also argues that most of the policies, programmes and schemes implemented by African member states have focused mainly on men and the crops they grow and have involved redistribution of land, technology and information in favour of men. Even where women bear most responsibility for food production, for example, agriculture extension services may deliberately be primarily aimed at men. Credit may also be provided only to borrowers who can pledge title to land or other assets as security, thus excluding women regardless of their ability to repay. This is because it is mainly men who have title to land (World Bank, 1989). Women are hence, in a sense wasted. Women, like men, need education and resources to add value to their raw labour. Evidence suggests that women farm as

well as men given similar access to land, inputs, education and training (U.N., 1983).

Studies have shown that women tend to be disproportionately represented among the poor. In countries like Kenya, it has been shown that the poorer the household the more likely it is to be headed by a woman and the trend is toward more poor female headed households (World Bank, 1989). Also findings from the Integrated Rural Surveys in Kenya had shown a significant difference between female headed households and their male counterparts. The mean annual income in male headed households was 19 percent greater than in female headed households (Horenstein, 1990). Overall, female headed households have fewer productive assets: they have less land, depend more on farming but are less involved with cash crops and cattle. Female headed households also have limited access to off-farm income earning opportunities (Horenstein, 1990). This fact was also supported by Due et al (1987) who showed that de jure female headed households are poorer and have less productive resources than joint headed households. In Tanzania and Zambia, Due et al (1986) found that de jure female headed households had smaller household size on average than male headed households. This meant fewer persons to assist with farm work. Given the small labour force, female headed households planted smaller acreages of crops and therefore had less total production for consumption or sale. With less income, they had fewer resources for hiring labour or oxen and plough or for purchasing fertilizers. In both countries credit was found to be

less available to females. Female headed households were also found to choose a different mix of crops, planting a higher percentage of their acreage to food crops and allocating some available labour to higher yielding activities like craft- making and beer brewing. Average crop sales income per household was only 12 per cent of the male household contact farmer in Tanzania and 18 per cent in Zambia, respectively (Due et al, 1986).

Phiri (1986), in a study of 100 male headed households and 100 female headed households in Malawi also supports the poor economic position of rural women. He found that female headed households had only 58 percent of the cash income of male headed households, grew more beans, rice and sugarcane than male headed households but lacked finance, land, skills and inputs for production.

Despite the disadvantaged positions, women have been shown to perform better than men generally given the same conditions. Moock (1976) in his study of the determinants of maize yield in Vihiga (Western Kenya), concluded that generally women are more competent than men as farm managers. This argument still holds even when women managers operate with lower levels of formal education and extension contact. Also the Integrated Rural Development Project (IRDP) study on oxen, in the North Western Province of Zambia, (Loeffler, 1989), found that women owners cultivated slightly higher hectarage (5.6 compared to 3.7) than men owners and that while charging the same fees, female owners earned, on average, slightly more per season than male owners. This

indicates that women have the capability of being better managers than men, given the means.

2.2 THE ZAMBIAN SITUATION

Research on women production in Zambia has shown that female labour is underutilised despite the fact that women have been willing to work their hardest in order to provide for their families (U.N. 1983). This underutilisation of female labour can be attributed to their limited access to agricultural land and other productive resource. Geisler et al (1985) in their study of the needs of rural women in Northern Province found that there were considerable differences in women's access to land. They found that women's access to land differ depending on whether they were at their husband's or parent's home,according to their age, marital status and the local economy. In areas where arable land is scarce or cash crop production is expanding, women seemed to have less access to land. They also found that though theoretically land is available in Zambia, many women do not have the time, because of their commitments, to claim land and prepare it in order to expand production. This situation is worsened by the limited availability of labour in female headed households.

In terms of availability of labour as a factor which restricts the amount of land cultivated by women farmers, it is widely noted that female headed households are smaller in size and that brings about labour deficiency (Geisler et al,1985). A survey

done by Bumbila and Sapuleni (1984) showed female headed households in the Chinsali sample as having on average 3.4 persons compared to 6.5 persons in male headed households. The Chilubi sample showed female headed households contained 1.9 working members compared to 2.7 in male headed households. As well as having a smaller available labour supply by comparison to male headed households, female headed households grow a narrower range of crops, have lower yields and are less integrated in cash crop production. In the 1982/83 Farm Survey which covered 20 districts in four provinces, commercial activities were noted in ten districts. In none of these districts were female headed households involved in such activities.

In Zambia, like in many other African countries it has been argued that rural development programmes have benefitted males and male headed households more than women and female headed households. The Southern African Team for Employment Promotion, SATEP, in their study of the impact of Village Agricultural Programme (VAP) found that female headed households were notably worse off than male headed households in terms of productivity, labour utilisation, availability of tools and access to extension services. Overall, it was concluded that VAP has benefitted men and male headed households more than women and female headed households (ILO, 1985). To support this, Ellis (1988) pointed out that the neglect of women in economic policies concerning peasant agriculture has tended to exacerbate the subordination of women and diminish the impact of policies designed to raise peasant output

and incomes.

Women and female headed households are not homogenous in terms of their access to productive resources. Chileya (1990) in his analysis of the data collected from two areas of Senanga West relating to the access of female heads of households to productive resources found that women in female headed households were more disadvantaged than women who were married. Other studies have shown that women utilise small plots ranging between less than a hectare to approximately three hectares and that widows have less acreages than divorced women (ZARD, 1985). However, findings from other studies (Himonga et al, 1988), indicate the possibility of widows and other women in female headed households being better off than married women in as far as access to land is concerned.

Himonga et al (1988) in their study of Women's access to agricultural land in Zambia revealed that cultural factors, such as marital status were important in land allocation to women.They found that married women applying for land were required to produce a written or oral consent from their husbands. Also lack of representation of women on decision making bodies, bureaucratic and lengthy procedures for processing applications for land, inadequate publicity on availability of land for allocation, socio-cultural constraints, lack of capital and implements and infrastructural constraints affect the women's access to land in Zambia.

2.3 ACCESS TO LAND, TENURE SECURITY AND AGRICULTURAL PRODUCTIVITY

In many countries, the pattern of land tenure is culturally determined, right to use land being assigned by, and at the will of the tribal chief or village authority, with the male family member making the decision on land use. In these circumstances women's access to land is doubly at the discretion of males. Such dependence on men is a particular handicap for women's agricultural efforts. Feder et al (1988) showed that ownership security had an effect on farm productivity and the use of inputs. In their study in Thailand, they performed a regression analysis of output and use of inputs per unit of land to find whether levels of output and use of inputs by titled farmers differed significantly from those of untitled farmers. The empirical analysis revealed that legal security of ownership significantly enhances productivity.

Land, security of tenure and productivity studies done in Africa (Kosura,1990; Migot-Adholla et al, 1990; Migot-Adholla, et al, 1991) however, redefined security of tenure to mean the ability of a farmer to cultivate a piece of land on a continuous basis, free from imposition, dispute or approbation from outside sources, as well as the ability to claim returns from land improvements while operating the land and upon its alienation.This definition recognises the fact that, unlike the Thailand situation, in Sub-Saharan Africa very few people have title deeds to their land and

still enjoy the security of owning land. This security was described in three categories depending on the rights of transfer. These land security or land rights categories are " complete transfer" rights, "preferential transfer" rights and "limited transfer" rights with complete rights being the most secure parcels of land. In their studies, Kosura (1990) and others did not show any relationship between the type of tenure security and productivity. As more than half of the labour in these study areas was of women, it can be said that holding other things constant, the type of tenure security on the land women operate will have no effect on their productivity. The total area of land under their operation is, however, expected to affect their total production as well as productivity.

In the same study, Kosura (1990) found that while plot size was negatively related to yield for all cropping patterns , showing diminishing returns, farm size was positively related to yields implying economies of scale. It is hence suggested that in terms of access to land, what affects women's agricultural production and productivity more is the area of land they cultivate rather than the type of security on that land or even the mode of acquisition of that land. This fact is supported by a study by Lee and Stewart (1983) on land ownership and the adoption of minimum tillage. Using a logit model with 7,649 cultivated cropland observations across the United States, they indicated that small operating size poses more of an obstacle to minimum tillage adoption than does the type of land ownership.

The effects of women's access to land on their productivity can be explained by the relationship between farm size and productivity. It links issues of technical and price efficiency, land ownership structure, peculiarities of factor markets and agrarian reform (Ellis, 1988). It involves the disentangling of various economic concepts related to farm size and scale of enterprise. Access to land by women has a relationship with their productivity due to imperfect factor markets and social efficiency. Ellis (1988) argues that small farmers face different factor prices to large farmers due to imperfections in factor markets. Specifically, small farmers face low price for labour combined with high prices for land and capital resulting in them committing more labour to production than large farmers.

A regression analysis done by Due et al (1990) on the 1986 Zambian data set of 124 farm households revealed that total acreage appeared to be the most important variable in accounting for the variability in total production. The multiple regression involved total crop production as a dependent variable and 12 independent variables among which were total hectarage, available labour, years of education, number of extension visits, farm operating costs and ox-pairs owned. Total hectarage was found to be highly significant (at 99.9 percent) with an incremental change value of K1572. Farm operating costs constituted the next important factor affecting total crop production followed by available labour, number of extension visits and years of education. Other studies of small farms in Tanzania (Due et al, 1987) have also

found the same variables: total hectarage, total farm operating costs and the number of extension visits _ to significantly affect total volume of farm production. As documented by a number of studies (Phiri, 1986; Due and Magayane, 1990; Chileya, 1990; Geisler et al, 1985) women and female headed households plant small hectarages and hence their total production is lower with a higher percentage needed for consumption. This supports the theory that accessibility to land by women is one of the most important factors affecting their total production and productivity.

Muntemba (1982) argues that the problem is not only the amount of land available but also land use and quality of land which constrain women's agricultural production. In her discussion of the effect of 20th Century land developments in the railway region of Zambia on female production, she concludes that patriarchal attitudes and the need to control female labour by men, combined with land pressures due to increased population have led to reduced women's access to land. The distances and scattered nature of women's plots along the railway region result in the underutilisation of allocated land. In addition, due to small size of women's holdings, good cropping methods, such as crop rotation, are difficult to follow resulting in low productivity. The combined effect of small size of land, scattered holdings, low and poor quality of land and the non existence of irrigation in the traditional agricultural sector is that women are confined to grow only those crops which require relatively little labour input and water.

2.4 ACCESS TO LAND, DECISION MAKING AND LABOUR INPUT

While the type of land tenure security might not affect the productivity of women directly, the type of land tenure security affects their decision making power, especially the control over income which is finally expected to affect their productivity.

Due to women's predominant role in providing food for the family, their access to and control of income is critical to their roles in assuming household food security. The issue of control over income is a delicate one since it is often related to access to land and can impinge upon deep seated cultural beliefs and traditions. But it has been shown that the ability to control income affects people's willingness to provide labour input and to be productive (Horenstein, 1990). Research from Kenya comparing the effectiveness of weeding (a female task) on maize yields in male and female headed households underscores the implications of the differential incentive structure. In female headed households, weeding raised maize yields by 56 percent while in male headed households, yields only increased by 15 percent (Horenstein,1990). This study suggests that where women controlled the crop and income from the crop, they did have the incentive to provide the necessary labour.

Similarly, a study in Ghana (Andah, 1978) revealed that where the women's clan inherits land and the wife works both on her brother's and husband's plots, she is likely to work harder on

her brother's crops because she has more control over the income form her brother's plots than her husband's. This study also suggests that lack of control over land implies that women have little incentive to improve either land or crops, consequently accounting for low productivity on farms .

In Zambia's Eastern province, the role of women in decision making was found to be higher in matrilineal than in patrilineal ethnic groups and women are more involved in decision making in low adoption and less commercialised areas than in high adoption and more commercialised areas. The involvement of women in agricultural decisions declines markedly in high adoption areas particulary among patrilineal ethnic groups (Siandwazi et al, 1991). The decision making role can be reflected in the control of land women have. Where they have less control: highly commercialised and patrilineal areas, they have less decision making power and hence access to less land than in less commercialised and matrilineal areas. This explains the belief that women on customary land might have access to more land than those in settlements or commercial farms.

Women in most parts of Africa have responded to their limited access to land by increasingly engaging in wage and no-farm employment. These include being agricultural labourers, traders, beer brewers and so on. Although the allocation of their labour to these activities is detrimental to household food welfare, it nevertheless provides important means for supplementing household income (U.N., 1989).

2.5 CONCLUSION FOR EMPIRICAL ANALYSIS

The above discussion leads to the following points for empirical analysis in this study which examines a sample of 100 women farmers in Zambia's Monze District.

1. Studies done so far indicate that farm size and productivity have a negative relatioship due to diminishing returns. However, with a proportionate increase in other inputs, like purchased inputs, labour and technology, it is expected that productivity can be improved by increasing the amount of land one has access to. This study will compare the productivity of women with access to more land and those with access to less land in order to assertain whether increased access to land is necessary for women's increased productivity.

2. Findings from studies done in other parts of Zambia have indicated that women in female headed households, especially widows, are the most disadvantaged in terms of access to productive resources. The analysis in this study will establish whether this is also the case where accessibility to land is concerned.

3. Literature review gives contradicting suggestions on the influence of land tenure security on women's agricultural production and productivity. The results of this analysis will give grounds on whether to support any of these assertions.

4. It is stressed that high decision making power increases women's incentives to improve their farm productivity and hence total production. This assertion will be confirmed if the analysis

indicates that decision making power is positively associated with total output and productivity.

5. The literature review has also indicated that women in areas of increasing cash crop production have access to less land. This study is intended to investigate whether this is true and also whether the involvement in cash crop production by women themselves has any relationship to the amount of land they have access to.

Overall,this study hypothesizes that women of different categories and in different situations face different constraints against the increase of their agricultural production and productivity. The analysis in this study is expected to emphasize the fact that different categories of women should be dealt with differently after identifying their particular problems, which include access to land.

CHAPTER THREE

METHODOLOGY

3.1 THE THEORETICAL FRAMEWORK

3.1.1 AGRICULTURAL PRODUCTIVITY MODEL

Land becomes an effective limitation in agricultural production where its access is limited because under a given level of technology, the total output will be increased by putting more land under cultivation. In households where agriculture is the main source of income, accessibility to land becomes a major factor in determining the income level of the household.

As cited earlier, Kosura (1990) found that plot size was negatively related to yields for all cropping patterns, showing diminishing returns. This is especially true where the increase in plot size is not matched with increase in other input use. However, increased total area of the farm is expected to make optimum use of the available purchased inputs, labour and implements and hence increase women's productivity, implying economies of scale. This is a strong argument for the fact that limited accessibility to land by women could be the cause of their low agricultural production and hence low income. In order to determine whether accessibility to land has a significant effect on women's productivity, the relative importance of different factors influencing agricultural productivity will be determined using multiple regression analysis. The dependent variable will be productivity (Q/Area) which is

average production per hectare. Explanatory variables will include:

X_1 Gender of the head of household

X_2 Woman's marital status

X_3 Level of education

X_4 Access to extension services

X_5 Land tenure security

X_6 Level of decision making power

X_7 Value of purchased inputs per hectare in Zambian Kwacha

X_8 Amount of accessible land in hectares.

X_9 Labour use per hectare in mandays.

The model can be represented generally as

$$Q = f(X) \ldots (1)$$

where X is a vector of variables as defined above.

The variables X_1, X_4, X_6 are only qualitative and thus, as suggested by Madalla (1988), are taken care of by the use of dummy variables. The variables entering equation (1) are described below.

Gender of the head of household (X_1)

In this study a head of a household was definedas the person who is the owner of the major resources in the household, especially land. Hence, a household with an absentee husband was considered as a male headed household though most of the day to day production decisions were made by the wife.

Women in male headed households are expected to be better

off in terms of labour availability, as joint families are usually larger than female headed households (Due and Magayane, 1990). They are also hypothesized to be in a better position in terms of technology and availability of purchased inputs. Following the same line of assumption, parri passu, women in male headed households are expected to have higher productivity than those in female headed households. The above explanation suggests that there is a difference in agricultural productivity as well as production between women in male headed households and those in female headed households. This fact will be tested in the analysis. The variable is represented by a dummy:

X_1 = 1 if male head or 0 if female head.

Woman's marital status (X_2)

A woman's marital status is categorised as being married, single (never married), divorced or widow. Safilios-Rothschild (1985) reported that different women face different conditions. Again using the arguments given under gender of head of household, married women are expected to have higher productivity than unmarried women, divorced women and widows. As most unmarried women are young women who stay with their parents, their productivity is also expected to be higher than that of divorced women and widows though not as high as that of married women. The variable is represented by four levels: 1 for married women, 2 for unmarried women, 3 for divorced women and 4 for widows. Each higher level is expected to show a decrease in productivity and total production

from the previous one.

Level of education (X_3)

Level of education is a proxy for the level of management. A woman with a higher level of education is assumed to provide better management and hence higher agricultural productivity. The variable is represented by three levels in the following order:

1 = no education, 2 = primary education, 3 = secondary education and above. With each higher level of education productivity and production are expected to increase.

Access to extension services (X_4)

Due and Magayane (1990) found that the number of extension visits was significant in affecting farmers' agricultural production. Here access to extension is not only confined to extension visits but also to those who have attended a course at a Farm Institute or Farmers Training Centre as well as those who are members of women's project groups.

A woman who has had access to extension services in terms of extension worker's visits or attending a course at the Farmers Training Centre or Farm Institute or is a member of a project group is expected to use better production methods and should therefore have a higher productivity than those without access to such services. The variable is represented by a dummy

X_4 = 1 if has access to extension services

0 if has no access to extension services.

Type of land tenure security (X_5)

It is assumed that the more secure the land tenure system the higher the agricultural production. This higher agricultural production is assumed to be a result of land tenure security affecting productivity positively through increased investment in land improvements. Security is defined as the ability of a farmer to cultivate a piece of land on a continuous basis, free from imposition, dispute or approbation from outside sources, as well as the ability to claim returns from land improvements while operating the land and upon its alienation (Migot-Adholla et al,1990). In this case land security is quantified on the basis of the individual use and transfer rights that farmers perceive they possess over specific parcels of land. The ability (right) to cultivate perennial crops, make permanent improvements or grow annual crops over many seasons conveys the continuous use of land. Furthermore, the possession of transfer rights, whether temporary through rent or permanent through sale, are important in the recovery of returns from land improvements upon transfer or alienation of land (Migot-Adholla et al, 1990). Three main land rights categories for this study are formed upon a mixture of both use and transfer rights:

"Limited transfer rights" _ those parcels of land which may not be permanently transferred by the current operator or on which he

cannot grow annual crops on a continuous basis.

"Preferential transfer rights" _ for parcels of land which the current operator has a right to cultivate perennial crops or make permanent improvements or grow annual crops over many seasons but cannot sell the parcel of land. He can, however, give or bequeath it to members of the same family.

"Complete rights" _ applies to parcels of land whose current operators have all the land use rights as well as being able to sell it and claim returns from land improvements.

Land parcels with complete rights are said to be more secure than those with preferential rights, which in turn are more secure than those with limited transfer rights. Hence,the variable is represented by three levels in the order of their strength. These are: 1 = limited rights, 2 = preferential rights and 3 = complete rights.

Level of decision making power (X_6)

Where a woman has a high decision making power, especially in areas of production, marketing and control of income, she has more incentives to provide more labour and inputs and hence higher agricultural production. The level of decision making power of a woman is considered to be high if she has a say in two or more of the following, including control over income:

production decisions and use of inputs, marketing of produce, consumption of produce and control of income and expenditure.

The variable is represented by the dummy:

X_6 = 1 if high decision making power or

0 if otherwise.

Value of purchased inputs per hectare (X_7)

The value of purchased inputs is a proxy for the amount of inputs used by the farmer, especially if during the period in question prices were controlled. It is assumed that the higher the value of purchased inputs used per hectare the more improved inputs the farmer uses (for example fertilizers, chemicals etc.) and the higher the agricultural productivity. Since the value of purchased inputs used per hectare depends on the total value of purchased inputs used for the whole farm then it is also expected that the total value of inputs used will affect total production positively. Due and Magayane (1990) showed that total farm operating expenses were the second most important explanatory predictor of total crop production. Though in this study only the value of purchased inputs and home produced seeds is considered, the results are expected to be similar. The value of manure is not included due to the fact that it is difficult to value and that very few women farmers were found to apply it on field crops. The variable will also show the importance of access to credit.

Amount of accessible land in hectares (X_8)

In the same study by Due and Magayane (1990) total hectarage was found to be the most important factor in determining the variability in total production. Andreae (1980) observes that

at the lowest level of agricultural development the amount of land cultivated must suffice to ensure that the labour and capital invested alone provides as high a crop yield as possible. Indeed up to a certain limit, crop yield achieved increases with the area of land in which a certain amount of capital is invested. Considering the fact that many studies have found that Zambian women, especially in female headed households, utilise very small areas of land (Kanyangwa and Muntemba, 1985; and Geisler et al, 1985) it can be safely assumed that very few women have reached this limit. Given the same amounts of labour and capital, and assuming there is little difference in land quality, those who cultivate more land have higher agricultural production . In addition, it is assumed that the higher the amount of land accessible to women the more land they cultivate. This, however, might not be the case if productivity or output/ha is considered instead of total production. The study will compare productivity for women with large parcels of land with those with smaller parcels of land.

Labour use per hectare (X_9)

Like input use per hectare, labour use per hectare, measured in terms of workdays, also shows the production intensity on a given area of land. It is assumed that using more labour per hectare allows production activities, like weeding, fertiliser application, control of insects and diseases, to be done more thoroughly thereby increasing crop yields and hence output per hectare. Thus, labour use per hectare is expected to positively

affect productivity.

Given the above variables the agricultural productivity model is represented specifically as:-

$$Q/A = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_9X_9 + U \quad . \quad . \quad . \quad (2)$$

where b_0 is a constant, $b_1, \ldots, b_9$ are coefficients of the different variables, X_i, as already explained and U the random error term assumed to be normally and independently distributed. The equation was estimated using Ordinary Least Squares (OLS) method. The main aim of the equation was to establish a relationship between the dependent variable, productivity, and the independent variables and not to create the production function. Also, the fact that a number of explanatory variables were dummy variables and not expected to show diminishing returns justified the use of a Linear Model rather than the Cobb-Douglas Model. Furthermore, by comparing the computer results, the Linear Model was found to give the best results in terms of the number of significant variables and the coefficient of determination R^2 compared to the Cobb- Douglas model.

3.1.2 ACCESS TO LAND MODEL

The amount of land accessible to women for their agricultural activities is hypothesized to be influenced by whether the woman is in a female headed household or male headed household (Z_1),her marital status (Z_2), whether she is on customary land, settlement schemes or commercial farms (Z_3), the total area of land possessed by a household (Z_4), the household size (Z_5), whether she is involved in cash crop production or not (Z_6) and her age (Z_7).

Gender of head of household (Z_1) and marital status (Z_2)

Married women and women in male headed households could be expected to have access to more land than those in female headed households in support of the findings that male headed households posses more land than female headed households (Due et al, 1987 and Phiri, 1986). This may not, however, be true considering the fact that most male headed households have big families and as such have to apportion the total land over a big number of individuals. Additionally, men will rarely allocate big parcels of land to their womenfolk as they want them to provide labour for joint fields as well. Widows and divorced women, on the other hand, though having less total land per household, have access to most of the household land and hence, may have access to more land than married women and women in male headed households. This fact will be tested in the analysis.

Gender of head of household will be represented by a dummy variable $Z_1 = 1$ if female headed household or 0 if otherwise.

Marital status of women variable, (Z_2), will appear in four levels, namely, 1 for maried women, 2 for unmarried women, 3 for divorced women and 4 for widows. It is hypothesized that the higher the level of marital status the higher the amount of land a woman has access to.

Type of land tenure system (Z_3)

Women are generally expected to have access to more land in customary land tenure system than in settlement schemes and commercial farms. This is because most farmers in settlement schemes have or are fighting for title deeds while almost all commercial farmers have title deeds. The possession of title deeds makes land more personal and valuable to the owner and encourages him to use it more commercially . This can lead him to restrict the amount of land he allocates to his women for their use. Since only customary and settlement schemes are involved in this model the variable is represented by three levels in the following order: 1 for customary land, 2 for settlement schemes and 3 for state land.

Total area of household land (Z_4) and household size (Z_5)

The total area of land, in hectares, possessed by a household is expected to be an important factor influencing the amount of land women have access to. Women in households with large areas of land are more likely to have access to more land than those in households with small parcels of land. The situation is

expected to be reversed with household size.Women in households with a large number of persons are likely to have access to less land since whatever amount of land belonging to the household has to be allocated among a large number of individuals.

Cash crop production (Z_6)

The relationship between area of land accessible to women and their involvement in cash crop production is both 'causal' and 'associative'. This means women involved in cash crop production are likely to fight harder to get more land for their production while at the same time it is the women who have access to more land who are likely to be involved in cash crop production. A positive relationship is therefore expected between the amount of land women have access to and their involvement in cash crop production. The variable is represented by a dummy

Z_6 = 1 if woman is involved with cash crop production or 0 if otherwise.

The presence of cash crop production in this study is identified by a farmer having at least half of the produce sold or the presence of pure cash crops like cotton, tobacco, soyabeans and sunflower.

Age of woman (Z_7)

Older women are expected to have access to more land for the simple reason that they have had more time to seek and accumulate more plots during the course of their lives. In addition, older women seem to have more probability of being helped

when they ask for land compared to young women who are thought to be still unsettled.

A multiple regression model is used in which the amount of land women have access to, in hectares, is the dependent variable (L). The model is represented generally as

$$L = g(Z) \quad . \quad . \quad . \quad (3)$$

where Z is a vector of independent variables defined above. Specifically, the model can be written as

$$L = a_0 + a_1 Z_1 + a_2 Z_2 + a_3 Z_3 + a_4 Z_4 + a_5 Z_5 + a_6 Z_6 + a_7 Z_7 + U \ldots (4)$$

where a_0 is a constant, $a_1, \ldots, a_7$ are coefficients of the different variables, Z_i, as already explained and u is the random error term assumed to be normally and independently distributed. The equation was also estimated using the OLS method. The linear model was in this case also found to be the most appropriate because with the amount of land being abundant in Zambia the relationship was not supposed to show diminishing returns. The ease of computation and interpretation of results as well as the fact that the equation showed a higher R^2 and more statistically significant variables also justified the use of this model rather than other models like the Cobb-Douglas.

3.2 SAMPLING AND DATA COLLECTION

3.2.1 Description of the study area.

The study was carried out in Monze District of the Southern Province of Zambia. The Southern Province is one of the nine provinces of Zambia. It is regarded as the countries "bread basket". It contributes 70 percent of the country's annual marketed maize and accounts for almost 50 percent of the marketed cotton and sunflower. It owns 80 percent of the country's 2.6 million head of cattle (Malambo, 1992).

Southern Province is 85,230 square kilometres in extent and, as of 1990 census, a population of 946,353, approximately 90,000 farm families,(Zambia, 1990 and Malambo 1992). Seventy nine percent of the population live in the rural areas and earn their living by tilling the land. Fifty one percent are females and 49 percent are males.

The Southern Province has the fourth largest population after Copperbelt, Lusaka and Eastern Province. Apart from Copperbelt and Lusaka, which are highly urbanised, the Southern Province has the second highest population density among the more rural provinces,with Eastern Province having the highest (C.S.O., 1990).

Monze District was selected as a study area within the Southern Province because it is one of the districts which is most likely to face land shortage problems. Apart from Livingstone District, whose high population density of 58.9 can be explained

by the presence of the tourist town, Monze has the next highest population density of 32.4 in the province, as shown by Table 3.1 below.

Table 3.1 Population Density by District, Southern Province, 1990

DISTRICT	POPULATION DENSITY (persons/sq km)
Choma	22.5
Gwembe	2.9
Kalomo	5.0
Livingstone	58.9
Mazabuka	23.1
Monze	32.4
Namwala	3.8
Siavonga	17.5
Sinazongwe	12.6

Source: Zambia, Republic of, 1990.

Monze District is situated in the plateau zone of the Southern Province. This zone is of moderately high mean rainfall (800-900 mm) and is a major productive zone of the province.

Appendix B shows the relative position of the Southern Province and Monze District in Zambia. Apart from being highly populated and a major productive zone geographically, the presence of a railway line passing through the district makes it a district whose agricultural land is very much sought after and hence capable

of facing a high incidence of land shortage. Personal observations of the researcher have shown that quite a number of farmers who want more land have opted to go to other less densely populated provinces, like the Central Province.

Like most other districts in Zambia, Monze has more women than men, 80,481 women against 76,970 men (Zambia, 1990). Safilios-Rothschild (1985) reported that Monze district had 28 percent of all households headed by women. All these factors justified the selection of Monze for this study of women's accessibility to land and its effect on their agricultural production.

3.2.2 The Sample

In February and March 1993, a sample of 100 women was interviewed to ascertain the amount of agricultural land accessible to them, their agricultural production and other constraining factors like labour, credit and extension.

Monze district is divided into four agricultural blocks administratively, namely, Monze Central, East, North and West. Only three blocks were involved in the study. The fourth block was excluded because most of it was rather too far and inaccessible during the rainy season. Each of the three blocks selected has a number of camps. Due to financial constraints, the camps in each block were selected on the basis of them being easily accessible by road. Each camp officer of the selected camps compiled a list of women farmers in his camp. The women to be interviewed were then

selected from the combined list using multiple stratified sampling. Women were first classified according to the type of land, that is, customary or settlement schemes. Then in each group they were again grouped in terms of marital status. Women were then randomly sampled from each sub-group. Out of 258 women listed under customary land 62 were selected. In settlement schemes, 21 women were selected out of a list of 82.

In order to get women on commercial farms, a list of all Zambian owned commercial farms within the three blocks was made. Only 14 of them were found to have wives or daughters in law involved in farming and these were added to the sample to be interviewed.

The following sample size from identified camps and blocks was planned.

BLOCK	CAMPS	SAMPLE
Central	Manungu and Simwendengwe	14
	Silwili and	
	Muyobe settlements.	21
East	Kaumba, Mujika, Njola and	25
	Namakube.	
North	Nteme, Chungu and Keemba	25
Commercial	---	15
TOTAL		100

However, an extra respondent was interviewed in the commercial block (n=16) and two interviews in Monze East were discarded because the respondents did not participate in farming during the 1990/91 season. Hence, Monze East had two less respondents (n=23) and the final number of respondents was 99.

3.2.3 Data Collection

Data comprised mainly primary data. Specific variables for which data were collected are:

i) Area of land owned and/or operated by women farmers in male headed households and female headed households; by married women, divorced women, widows and those who have never been married.

ii) Patterns of land acquisition, type of land tenure security and land use by women on customary land, settlements and stateland.

iii) Production of food and cash crops by area and yield for different categories of women.

iv) Other constraining inputs: labour, credit, extension services level of education, age and decision making power.

Primary data was obtained through formal interviews with women farmers in both male and female headed households residing on customary land, settlement schemes and stateland in Monze district. Due to the fact that the last season (1991/92) was hit by drought and the 1992/93 season was not yet complete, production figures asked for were those for 1990/91.

The questionnaire was pretested in two blocks and adjustments done accordingly.Due to financial constraints, it was necessary that the agricultural assistants in the respective blocks be involved in doing the interviews as they could use motorbikes and bicycles which were a cheaper mode of transport.

Informal interviews were also carried out with government officials at the District Council and District Agricultural Office. Two traditional chiefs, Chief Choongo and Chief Chona, were also interviewed informally. Official records of the Land Use Planning Unit of Monze District were also examined.

3.4 SPECIFIC TESTS FOR POPULATION REGRESSION COEFFICIENTS AND STATISTICAL INFERENCE

Linear functions were used to explain the determinants of farm productivity and the amount of land accessible to women. On the basis of these analyses, the two functions were fitted to data using the Statistical Package for the Social Sciences (SPSS). The assumptions of Ordinary Least Squares method (OLS) were used. These included :

1. That the dependent variable can be calculated as a linear function of a specific set of independent variables, plus a disturbance.
2. That the expected value of the disturbance term is zero, that is, the mean of the distribution of the disturbance term is drawn as zero.

3. That all the disturbance terms have the same variance and are not correlated with one another.

4. That the observations on the independent variable can be considered fixed in repeated samples.

5. That the number of observations is greater than the number of independent variables.

Four criteria were used to select the best function.

a) The first criterion is that the signs attached to the explanatory variables should be in agreement with economic theory and the logic of small scale farm production so that the function is economically meaningful. In equations (2) all the coefficients are expected to have positive signs except X_2 as indicated by the literature review. Also in equation (4) all the coefficients are expected to be positive except Z_5. However, some estimated parameters were likely to have wrong signs due to violation of some of the above stated assumptions. This could be caused by a violation of the fifth assumption which could result in a problem of multicollinearity, that is, two or more independent variables being approximately linearly related in the sample data. To avoid this the correlation coefficients were determined to identify those variables which were highly correlated and exclude one of these from the model.

b) The second criterion is that the 'best' regression equation should contain as many variables as possible that are significant in explaining the variation in the dependent variable. The tests of significance relating to each regression coefficient explanatory

variable (B_i) is made using the t-ratio.

The t-statistic for B_i obtained from a sample is

$$t = \frac{\hat{B}_i - B}{S^2 \hat{B}_i}$$

n-k degrees of freedom, where n is the sample size and k is the number of independent variables including the constant.

This, in testing the null hypothesis that B = 0 reduces to

$$t = \frac{\hat{B}_i}{S\,\hat{B}_i}$$

where S is the standard deviation of the sample and $\hat{B}_i$ is the estimated value of the coefficient B.

Thus the sample value of t is estimated by dividing the estimated B_i by its standard error. This value of t which defines the critical region in a two tailed test, with n-k degrees of freedom (n= sample size, k = number of estimated parameters) at 5 percent level of significance. If t falls in the critical region we reject the null hypothesis, that is, accept the estimated B_i as being statistically significant, and vice versa.

c) The third criterion is the F statistic, which is also given in the results and used in the Analysis of Variance (ANOVA) approach, to test the joint significance of all the independent variables in

a multiple regression. It provides a test of the null hypothesis that the slope coefficients are simultaneously zero, that is, H_o: $B_1 = B_2 = \ldots = B_8 = 0$. If the F value computed exceeds the critical F value from the tables at our specified level of significance, the null hypothesis is rejected, otherwise it is accepted. If the null hypothesis is rejected it means all the independent variables taken jointly have a significant effect on the dependent variable.

d) The fourth criterion is the value of the coefficient of multiple determination (R^2). It measures the goodness of fit by showing the amount of variation in the dependent variable that is explained by the changes in the explanatory variables. The higher the R^2 value the higher the percentage of the variation accounted for. However, a high R^2 in conjuction with a low Durbin_Watson statistic suggests a mis-specification of the model. To ensure that the model was not mis-specified a Durbin-Watson test was carried out to show whether there was any autocorrelation among error terms (violation of the third assumption).

Generally

$$R^2 = \frac{\sum (\hat{Y} - \overline{Y})^2}{\sum (Y - \overline{Y})^2}$$

$$= \frac{\text{variation of Y explained by all regressors}}{\text{Total variation of Y}}$$

Since the inclusion of even an irrelevant regressor will increase R^2 somewhat it is usually desirable to correct for this by adjusting the R^2 for degrees of freedom. If there are k regressors the corrected or adjusted R^2 is defined as

$$R^{-2} = (R^2 - \frac{k}{n-1})(\frac{n-1}{n-k-1})$$

(Wonnacot and Wonnacot, 1979).

This can be shortened to

$$R^{-2} = \frac{1-(1-R^2)n-1}{n-k}$$

The adjusted R^2 takes into account the degrees of freedom, which decrease as new regressors are introduced into the equation for a given sample size.It is with these criteria that the regression equations in Tables 4.9 and 4.10 were selected to be the best functions for Productivity (Q/Area) and Area of Land Accessible to Women (L) respectively.

CHAPTER FOUR

EMPIRICAL RESULTS

4.1 DESCRIPTIVE ANALYSIS

The final sample used for analysis in this study had 99 respondents. Twenty one percent of the respondents were from the settlement schemes, 16 percent from commercial farms (stateland) and 62 percent from customary land.

In terms of marital status, the sample was made up of 54 percent married women, 20 percent widows, 19 percent divorced women and 7 percent unmarried women. Thirty five percent of the respondents came from female headed households while the rest were from male headed households.Of the 99 respondents, only 42 (42 percent) were found to be involved in cash crop production. The rest either sold very little or did not produce anything for sale. Only twenty six percent of the respondents showed that they had access to credit while 75 percent had access to extension services.

4.1.1 Amount of land available to women.

Table 4.1 shows the calculated average area of land available to women according to the gender of the head of household, marital status of women, type of land occupied and presence of cash crop production.

Table 4.1 Mean Areas of Land Available to Women of Different Categories

CRITERIA	MEAN AREA (HECTARES)
1. Gender of head of household	
a. Female	4.05
b. Male	2.17
2. Marital status	
a. Married	2.15
b. Unmarried	2.88
c. Divorced	2.83
d. Widows	4.85
3. Type of land tenure system	
a. Settlements	1.99
b. Customary	3.38
c. Stateland	2.05
4. Cash crop production	
a. Present	4.34
b. Absent	1.78

Source: Author's survey.

The average areas indicate that women in male headed households have access to less land (2.17ha) for their agricultural production than those in female headed households

(4.05ha). According to marital status married women were found to have access to the least area of land (2.15ha) compared to women who are unmarried (2.88ha), divorced (2.83ha) and widows (4.85ha). Widows were found to have access to the largest area of land for agricultural production.

According to the type of land, the amount of land accessible to women in settlement schemes (1.99ha) does not seem to differ much with that from the commercial farms(2.05ha). In both cases, land parcels are registered officially in specific individual names and these are almost always males. Only one woman said she owned the settlement while there was no single woman who was the owner of any commercial farm. The area of land available to women on customary land (3.38ha) was higher than in settlement schemes and commercial farms.

The survey data also shows that the amount of land available to women who produce cash crops is higher (4.34ha) than that available to women who do not produce cash crops (1.78ha) showing that there might be a relationship between women's participation in cash crop production and the amount of land they have access as shown in Table 4.1.

4.1.2: Source and mode of land acquisition.

The amount of land accessible to women could be related to the mode of acquisition and source of original owner as illustrated by Table 4.2

Table 4.2: Mode of Land Acquisition and Mean Areas of Land Accessible to Women

Mode	Married		Unmarried		Divorced		Widow		Total	Average
	No	%	No	%	No	%	No	%	%	Area
1.Purchase	-		-		-		-		-	
2.Inherit	4	7	1	17	5	26	11	55	21	5.82
3.Given	50	93	5	83	14	74	9	45	78	2.06
4.Government	1		-		-		-		1	8.0
Total	55*		6		19		20		100	

* Some women had more than one mode of acquisition.

Source: Author's Survey.

Four main important methods of land acquisition were identified. These include purchase, inheriting, being given and government allocation. For women, only three methods were found to apply, namely, inheriting, being given and government allocation. Some women had acquired land through more than one method, for example, inheriting and being given. On the overall, 78 percent of the women had acquired their land parcels by being given, 21 percent had inherited and only one percent had land allocated to them by the government directly. Hence, being given land, temporarily or permanently, was the most important method of land acquisition for women. Table 4.2 also shows that women who acquired land by being given had the lowest area of land (2.06ha) accessible to them compared to those who had inherited (5.82ha) or those who got land directly from the government schemes (8.0ha).

4.1.3: Land tenure security.

Table 4.3 Land Tenure Security by Type of Land

	TYPE OF TENURE SECURITY							
Type of land	Limited		Preferential		Complete		Total	
	No	%	No	%	No	%	No	
Settlements	19	90	-	-	2	10	21	
Customary	27	43	35	56	-	-	62	
Stateland	13	81	3	19	-	-	16	
Total	59	60	38	38	2	2	99	100%

Source: Author's Survey

Table 4.3 shows that there are more women, generally, with limited rights (60 percent)) than with preferential rights (38 percent) or complete rights (2 percent). Out of the 38 women with preferential rights 92 percent are from customary land and 8 percent from stateland. Only 2 women were found to have complete rights and these were found in settlement schemes.

Table 4.4: Land Tenure Security by Woman's Marital Status

Category	Limited		Preferential		Complete		Total
	No	%	No	%	No	%	No
Married	44	81	10	19	-	-	54
Unmarried	3	50	3	50	-	-	6
Divorced	7	37	12	63	-	-	19
Widows	5	25	13	65	2	10	20
Total	59	60	38	38	2	2	99

Source: Author's Survey.

A higher percentage of married women was found to have limited transfer rights (81 percent) which could be associated to their mode of land acquisition in which most of them are given land by their husbands. Sixty three percent of the divorced women had preferential rights showing that they have more control of their land. This was also found to be true with widows, for which 65 percent had preferential rights. Only 2 percent of the women had complete rights and these were widows. Overall, the highest percent of women (60 percent) had limited transfer rights, and most of it was made of married women.

The characteritics described in this section show that women of different categories have access to different amounts of land. It has been shown that women in male headed households, especially married women, have access to less amount of land than women in female headed households. This supports the findings by Geisler et al (1985) who showed that women's access to land is

affected by their marital status, among other things. It also supports the observations by Himonga et al (1988) that married women had more constraints in acquiring their own land. While Chileya (1990) stated that women in female headed households, especially widows, were worse off in terms of productive resources, the findings here do not support this statement in as far as access to land is concerned. Widows are shown to have access to the highest amount of land compared to other types of women. The findings in this section have also indicated that there is a relationship between mode of land acquisition and the amount of land accessible to women. Women who had acquired land straight from government allocation or by inheriting have been found to have access to more land than those given by husband or relatives.

The descriptive analysis in this section also shows that women involved in cash crop production have access to more land than those not involved in cash crop production. This indicates that there is a relationship between cash crop production and the amount of land accessible to women.

4.1.5: Agricultural Production and Productivity.

The total value of agricultural produce for the season in question was used to indicate the agricultural production of women. Productivity was calculated by dividing total value of agricultural production with the area of land accessible to women.

Table 4.5: Average Total Agricultural Production and Land Productivity for women of Different Categories

CRITERIA	MEAN TOTAL PRODUCTION K*	PRODUCTION /HA K*
1. Gender of head		
a. Female	18,913	4728
b. Male	13,857	6298
2. Marital Status		
a. Married	13,613	6331
b. Unmarried	15,560	5402
c. Divorced	12,631	4479
d. Widow	23,722	4891
3. Type of land tenure		
a. Settlement	14,215	7143
b. Customary	16,277	4815
c. Stateland	14,700	7170
4. Cash crop production		
a. Present	23,995	5580
b. Absent	9,387	5215

* K is an abbreviation for Zambian Kwacha.

Source: Author's Survey.

Table 4.5 gives a summary of average total production and productivity figures for women according to the gender of head of household, marital status, type of land and presence or absence of cash crop production. According to the gender of head of household,

women in female headed households have higher total agricultural production (K18,913) than those in male headed households (K13,857). In terms of marital status widows have the highest total agricultural production (K23,722) while married (K13,613), unmarried(K15,560) and divorced women (K12,631) have lower total production. According to the type of land, women in customary land have a slightly higher total production (K16,277) than those on settlements (K14,215) and commercial farms (K14,700). Women involved in cash crop production have a total production of K23,993 which is more than double that of those not involved in cash crop production (K9,387).

The issue is somehow reversed when considering productivity rather than total production. Here productivity is defined as the average production per hectare. If Tables 4.1 and 4.6 are observed simultaneously they show that the higher the average area of land the lower the land productivity. Women in female headed households were found to have access to an average of 4.05 hectares and a total production of K18,913. Their land productivity, however, was only K4728/ha as compared to that of women in male headed households whose land productivity was K6298/ha but they had access to an average of only 2.17ha and a total production of K13,875. Similar trends are seen with the marital status of woman and type of land. Though women in settlement schemes and commercial farms seem to have access to less land than those in customary land, their land productivity is higher , K7143/ha and K7171/ha respectively compared to K4015 for

customary land.

Table 4.6 Tenure Security, Area, Total Production and Productivity

Tenure security	No. of Women	%	Average Area of Land (ha)	Average Production (K)	Q/ha (K)
Limited	59	60	1.8	11,520	6,400
Preferential	38	38	4.5	21,384	4,720
Complete	2	2	5.75	33,650	5.852
Total	99	100			

Source: Author's Survey.

Tenure security has been found to be related with the area of land women have access to. Women who have higher land security are shown to have access to more land. Table 4.6 also shows that women with higher tenure security have higher total production but it does not give any conclusive result about the relationship between land tenure security and productivity (Q/A).

The descriptive analysis in this section reveals that women of different categories have different levels of agricultural production and productivity. Women in female headed households' especially widows, have been found to have high total production than married women. They are, however, found to have lower agricultural productivity indicating that their high production is

a result of their access to more land as found in Table 4.1. The results in this section have also shown that women with high land tenure security have higher total production . No conclusion could be drawn about land tenure security and women's productivity. These findings show that the area of land is more important in increasing women's total production than the type of land tenure security they have. Land tenure security is important in as far as it affects the amount of land accessible to women.

4.1.6 Credit facilities and use by women

The survey data showed that only 26 women (26 percent) had access to credit in the year in question. Seventy three women (74 percent) did not have access to credit facilities due to a variety of reasons.

Out of the 26 women who got credit, 22 (85 percent) got it from the Cooperative Union and Savings Association (Cusa) or other types of cooperative societies. Only one got credit from Lima Bank, a bank specifically charged with giving agricultural loans in Zambia, and only one got credit from a normal commercial bank. Two women got credit from informal sources, namely, a trader and a friend. Ninenty six percent of all the women who got loans used them on maize production and the remaining 4 percent used it on cotton production. None of the women who got loans used land as collateral though the average amount of land accessible to them was higher (3.05ha) compared to that of those who did not get credit (2.08ha).

Among the reasons given for not getting credit by the 73 women are: they were afraid to apply fearing to get into debt (21 women or 29 percent), had applied but were not given (19 women or 26 percent), did not need credit (10 women or 14 percent) and 6 women (8 percent) said they did not know where and how to get credit. Out of these 6 ignorant women 5 were found to have had no access to extension services also. The rest of the women did not apply for credit because they were not members of the cooperative societies or they did not grow the required crops or their husbands forbade them.

These results show that, despite the importance of credit as a means of increasing women's access to productive resources, especially purchased inputs, little effort seems to have been taken to increase women's access to credit. The fact that a high percentage of those who got credit got it through cooperatives shows how difficult it is for women to get credit through other institutions, especially commercial banks. Since more than 50 percent of those who did not get credit did not even attempt to apply for it, it can be concluded that very little has been done on the part of extension workers to educate women on the importance of credit and where and how to get it. On the part of credit institutions it seems that they have set difficult borrowing conditions which have become a major factor discouraging women from applying for loans. It is also a pointer to the government that it should support the cooperative societies, which are the main source of credit to women farmers, by giving them funds to enable them

give credit to more women.

Table 4.7 Input Use. Labour Use and Household Size According to Women's Category

Criteria	Input use/ha (K)	Labour use/ha Work-days	Household size Persons
1. Gender of head			
a) Female	1240	45	4.7
b) Male	1664	62	8.1
2.Marital status			
a) Married	1629	65	8.25
b) Unmarried	929	41	8.08
c) Divorced	1239	40	4.24
d) Widow	1130	48	5.45
3.Land tenure security			
a)Limited	1245	68	7.3
b)Preferential	1040	41	6.5
c)Complete	1898	68	4.25
4.Access to credit			
a) Yes	1651	59	6.9
b) No	944	51	6.8

Source: Author's Computations

Table 4.7 shows that married women use more inputs as well as labour per hectare. This fact is also supported by the fact that women in male headed households were also found to have higher input and labour use. Labour availability in terms of household size was also found to be higher for male headed households (8.1) compared to that of female headed households (4.7). This might account for the higher labour use per ha by women in male headed households.

In terms of land tenure security, women with complete rights were shown to use more input value per ha but those with preferential rights did not seem to use more inputs than those with limited rights. There was, hence, no indication that land tenure security affects input use. The same was the case with labour use.

There was a substantial difference between the amount of input use per ha for women who got credit and those who did not. Women who got credit used K1651 worth of inputs/ha on average while those without credit used K944/ha. Also women who got credit used more labour (59 work-days/ha) than those who did not get credit (51 work-days/ha) despite the fact that they had very little difference in their household sizes. This emphasizes the importance of increasing credit availability to women in order to increase their input and labour use.

REGRESSION RESULTS

4.2.1 Agricultural Productivity

The main objective of the study is to find out whether the amount of land women have access to for their agricultural production and the type of tenure security they have, has any effect on their productivity. To find this, a regression analysis was carried out with productivity (Q/Area) as the dependent variable against selected explanatory variables.

4.2.1.2 Regression Results for Productivity Model

A regression analysis was done involving Productivity (Q/Area) as a dependent variable and gender of head of household (X_1), level of education (X_3), access to extension (X_4), type of land tenure security (X_5), level of decision making power (X_6), value of input use per hectare (X_7) and labour use per hectare (X_9) as explanatory variables. Marital status was not included because it was highly correlated to gender of head of household.

Table 4.8 Regression Results of the Productivity Model.

Dependent variable: Total Production/Area (Q/Area) in 000'Kwacha.

Independent Variables	B	SE B	T-RATIO
Intercept	-6.286	2.947	-2.133
Gender of Head (Dummy X_1)	1.691	.752	2.246**
Education (X_3)	.087	.504	.174
Extension (Dummy X_4)	.629	.661	.952
Tenure security (X_5)	.979	.627	1.563
Decision making (Dummy X_6)	1.317	.670	1.965*
Input use/ha (X_7)	1.606E-03	2.962E-04	5.421**
Labour use/ha (X_9)	.049	4.64E-03	10.577**

R^2 = .715 R^{-2} = .693 F = 32.32** DW = 1.935

** Significant at 0.01 L.O.S. * Significant at 0.05 L.O.S.

Source: Author's Survey

The F value shows that the independent variables are jointly significant in explaining the agricultural productivity of women. The coefficient of determination, R^2 of .72 indicates that the regression plane explains 72 percent of the total variation of the values of land productivity from their mean. About 28 percent is unexplained and can be attributed to ommitted factors. The Durbin Watson test of 1.93 was greater than the upper limit of the DW, that is, D_u which was 1.850. This showed that there was no serious case of autocorrelation among the error terms.

Regression results in Table 4.8 show that while gender of head of household, decision making power, input use per hectare and labour use per hectare are important factors affecting women's agricultural productivity, the type of land tenure security does not seem to be an important factor.

Gender of head of household was represented as a dummy variable therefore the coefficient of 1.691 indicates the difference in intercepts between productivity for women in female headed households and that for women in male headed households. Keeping other things constant, women in male headed households have higher productivity than those in female headed households. This fact is also supported by the descriptive analysis in Table 4.7 where women in male headed households are found to have higher output/ha. This finding could be explained by the fact that women from male headed households were found to use more inputs per hectare (K1664) than those in female headed households (K1240). This supports the finding by ILO (1985) that female headed households were worse off in terms of productivity than those in male headed households. It also agrees with conclusions drawn by Chileya (1990) that women in female headed households, especially widows, were the most disadvantaged in terms of access to productive resources. In addition, the study by ILO (1985) found that female headed households were poor in labour utilisation, availability of tools and extension services. Male headed households, on the other hand, were found to be better off in terms of availability and utilisation of labour, availability of better

technology and possession of tools, especially ox-drawn equipment. It was found that labour availability, as measured by the number of adult units present in the household, is higher in male headed households (8.1) than in female headed households (4.7). This is another explanation for the reason women in female headed households have lower productivity. In terms of technology, it was found that though most of the women (93 percent) used oxen only 13 percent owned them and hence most of them were at the mercy of the owners in terms of time of ploughing and planting. This situation is worse for women in female headed households who have to get oxen from different households completely. This, apart from access to inputs and availability of labour, could be another cause of the poor productivity of women in female headed households.

Table 4.5 in the descriptive analysis shows that married women and unmarried women have higher production/ha than divorced women and widows, emphasising the point that women in male headed households have better productivity due to increased access to productive resources. The poor productivity of women in female headed households, especially widows, can also be explained by the low input and labour use, as shown in Table 4.7, and the type of land they have access to. Safilios-Rothschild (1985) pointed out that most women in female headed households, especially widows, have access to poor marginal land. Although this study did not analyse the soil types on women's fields, it was found that all the women with land which was capable of being irrigated were either married women or those in male headed households. This indicates

that it is rare for women in female headed households to have access to good types of land and hence their likelihood of having poor productivity.

The level of decision making power showed a positive relationship with women's agricultural productivity. This being a dummy variable, the coefficient of 1.317 indicates a shift in productivity for women with high decision making power. It shows that women with high decision making power have productivity which is K1317 higher than that for women with low decision making power. These results emphasize the importance of increasing women's decision making power, especially their control over the crop and income, in order to increase their production as was found in the research from Kenya (Horenstein, 1990). Women with a high level of control over their crops and the income obtained from selling them will usually work harder, sacrificing their leisure time and engaging less on non-farm activities. They are also likely to buy more inputs for their fields since they control the use of their agricultural income.It has also been found that the strength of female decision making power in the household is positively related to the extent of women's participation in the market economy and negatively related to their input into subsistence agricultural production and domestic work (Acharya and Bennett, 1983). The same explanation could be given as to why they have higher production in this study. By involving themselves with the market economy they are likely to grow better paying crops than those with low decision making power.

Labour use per hectare and input use per hectare, as expected, also showed to be important factors in affecting women's agricultural productivity. An increase in the amount of labour used per hectare by 1 work-day is shown to be capable of increasing output per hectare by K49. Meanwhile, an increase of the value of inputs used per hectare by K1.00 is likely to increase women's output/ha by K1.61. This is an indication that women who spend more on inputs per hectare are likely to use more purchased inputs, such as fertilisers, improved seed and so on, and are therefore likely to get higher yields and hence higher output/ha. These results are similar to those of Due et al (1990) and emphasise the importance of increasing availability of purchased inputs to women. The results also show that an increase in labour use/ha is important in increasing women's productivity as well as total production. Increased labour use/ha allows more intensive production techniques and hence higher yields and output per hectare. This could also explain the low productivity for women in female headed households. A number of studies, Geisler et al (1985), Bumbila and Sapuleni (1984) and others, have shown that female headed households have access to less labour due to their small family sizes.

Although the results in Table 4.6 of the descriptive analysis showed that women with high land tenure security have higher total production than those with lower land tenure security. Regression results did not show it to be important in affecting women's productivity. This finding is in agreement with the

findings of the studies done in Sub-Saharan Africa about the effect of land tenure security on farm productivity (Kosura, 1990 and Migot Adholla, 1991). It could be explained by the fact that land tenure security does not seem to be correlated to any of the other important factors of production except the amount of land accessible to women. Many of the women in the study had either limited rights or preferential rights and only two had complete rights with title deeds. None of those with preferential rights were any better off in having access to credit than the ones with limited rights because they also had no title deeds and could not use the land as collateral. The ones with complete rights did not also get credit using land as collateral for one reason or the other, mostly because of fear and the complicated procedures. The final conclusion is that, having more control over their parcels of land did not seem to increase women's access to other factors of production and hence had no effect on their productivity. However, higher total production was shown to be related more to the amount of land available rather than the level of tenure security.

Both access to extension services and the level of education showed non-significant relationship with women's agricultural productivity. This means the observations by Due et al (1988) where the number of extension visits and the years of education were found to significantly affect agricultural income could not be confirmed by this study. One likely explanation is that the indicators used to show access to extension services were not adequate and that most probably almost all the respondents had

access to extension services in one way or the other, especially since the sample was selected from accessible areas mainly. In addition, the fact that most of them were producing at a subsistence level, little difference could be expected to be shown by those who had extra knowledge either through access to extension or through higher education. Further more, women with higher education, especially secondary and above, seemed to be less committed to on-farm activities than those with lower education levels preferring to engage themselves in off-farm activities like sewing, baking and cattle trading. Hence, despite their supposed higher knowledge, their productivity could hardly be better than that of women with lower education.

4.2.2 Area of Land accessible to women.

The second main objective of the study was to find out the factors that influence the amount of land accessible to women for their agricultural activities. To find this the amount of land accessible to women was regressed against designated explanatory variables. These were marital status of the woman, presence or absence of cash crop production, type of land (whether settlements, customary or commercial),age of woman, total household composition and total area of household land.

Descriptive analysis shows that there is a very big difference in the total area of land owned by the households between commercial farms and settlements and customary land. Whereas settlements and customary land show the average area of

land per household to be 7.8 and 8 hectares, respectively, commercial farms have an average area of 1089 hectares. Despite such a big difference the average amount of land accessible to women in commercial farms does not differ much from that of women in settlements and customary land as shown by Table 4.1. Due to this, it was felt that data from commercial farms be excluded from this model.This means that only two types of land types were considered, namely settlements and customary land.

Table 4.9 Regression Results of the Area of Land Accessible to Women

Dependent variable: Area of land accessible to women (L).

Independent variable	B	SE B	T- RATIO
Intercept	-7.59181	1.85807	- 4.085
Cash crop (Dummy z_6)	1.93138	.63474	3.043**
Type of land (Dummy z_3)	1.08475	.72680	1.492
Marital status (z_2)	.94948	.29189	3.253**
Age (z_7)	.05339	.02508	2.129*
Total HH land area (z_4)	.39751	.06558	6.062**
Household size (z_5)	-.26992	.08617	- 3.132**

R^2 = .49329 R^{-2} = .45329 F = 12.33122** DW = 1.97454

* Significant at .01. * Significant at .05.

Source: Author's Survey.

The coefficient of determination, R^2, is .49 implying that the regression plane explains 49 percent of the total variation of the areas of land accessible to women. About 51 percent is unexplained.

The F value, also given in the results, is significant at 1 per cent level of significance, showing that all the explanatory variables taken jointly have a significant effect on the amount of land accessible to women. The Durbin Watson test of 1.97 also indicated that there is no serious case of autocorrelation among the error terms as it was greater than the upper limit of D_u = 1.826.

Results from the regression equation in Table 4.9 show the involvement of women in cash crop production to have the strongest relationship with area of land women farmers have access to. The relationship is positive indicating that women involved in cash crop production have a higher level of access to land compared to women not involved in cash crop production. This means, on average, setting all other things equal, women involved in cash crop production are likely to have access to 1.93 hectares of land more than those not involved in cash crop production. This agrees with the theory that an involvement in the market economy through the production of cash crops is an incentive to women to seek more land. It could be said, on the other hand, that women with access to more land are likely to be involved with cash crop production. Women involved in cash crop production are assumed to be better off than their counterparts as they can take advantage of

the high producer prices for their cash crops and hence can afford to buy more inputs despite the increased prices (Geisler et al, 1990). Since they can afford to buy more inputs or pay for the required services and at the same time are attracted by the high producer prices for their cash crops, they will have the urge to ask or apply for more land from the sources they have access to. Women not involved in cash crop production on the other hand, sell very little and do not benefit from the increased prices of outputs. They are, however, expected to pay the same high prices of inputs even for their food crop production and they seem to afford less and less as the prices continue to rise with each passing season. This makes them lose interest in looking for more land when they cannot cultivate the whole area of what they already have.This fact concurs with what was indicated by some respondents that they could not look for more land because of lack of inputs, draft power and equipment.

Marital status, represented in the order of married, unmarried, divorced and widows, showed the second strongest relationship with the area of land women have access to. The positive coefficient indicates that moving from married women to unmarried, divorced and widows the level of access to land will keep on increasing. Married women seem to have the lowest level of access to land. Their level is .95 hectares lower than for unmarried women whose level is in turn, on the average .95 hectares lower than for divorced women. Widows are shown to have the highest level of access to land. While these results do support those of

Geisler et al (1985) and Himonga et al (1988) in the theory that different categories of women differ in their access to land, it does not confirm the assertion by Chileya (1990) that widows are the most disadvantaged, at least in terms of land. On the contrary, widows seem to have more land accessible to them than the other categories of women. One of the explanations for this outcome could be that because most married women are in male headed households, their access to land depends mainly on what they have been allocated by their husbands or in-laws. This usually is limited as their husbands or in-laws expect them to also work in the joint fields. The widows and divorced women on the contrary, first of all get their land parcels from their relatives through inheritance or directly from chiefs and village headmen. These usually give bigger pieces of land, hence, their parcels are relatively bigger than for married women. Secondly, most of the widows and divorced women are heads of their own households and therefore, no matter how small their household land is they have access to most of it.

By virtue of being their own heads, widows and divorced women seem to get a more sympathetic ear when they present their land problems to chiefs and village headmen. This was disclosed by both Chief Choongo and Chief Chona during the informal interview with the author. They indicated that they were more than willing to help widows and divorced women facing land problems, especially elderly ones, whereas they felt that the land problems faced by married women could be solved by their husbands. This could also explain the fact that age showed a positive relationship with the

amount of land women have access to. The results indicated that as a woman gets older the amount of land she has access to is likely to increase despite having to share part of it with children. It was said by the Chiefs that young women rarely asked for more land because they felt that they were not settled and that at any time they could get married and leave the land. May be married women have the same fear and that is why they do not ask or apply for land in their own rights. In addition, as found by Himonga et al (1988), married women are discouraged from applying for land since they are required to produce their husbands' consent first.

The regression results have also shown that size of land possessed by the household and household size are important factors affecting the amount of land women have access to. Holding other factors constant, increasing the total household land area by one hectare will increase the amount of land a woman has access to by 0.4ha. Hence, considering women in settlement schemes and customary land only, those in households with larger parcels of land are likely to have a higher level of access to land than those in households with less land. These results do concur with the logical reasoning that farmers with more land can spare larger areas of land for their women compared to those with less land. It can even be assumed that one way of solving women's access to land problem is by encouraging men to acquire more land for their households.

Household size, measured in terms of the number of persons over 14 years of age in the household, has also shown a

strong relationship with the amount of land women have access to. The age of 14 years was used because it was found that youngsters above that age tended to demand for small plots for their own production. The relationship is negative, which indicates that increasing the household size by one person will decrease the level of access to land for a woman by 0.27ha, holding all other factors constant. This, again, concurs with the logical reasoning that women's access to land is constrained by the amount of land available and the demand for land by the household. Bigger households have to allocate plots to more persons for their individual agricultural activities and hence women in these households are likely to have access to less land than those in smaller households. This supports further the reason that married women and women in male headed households have access to less land compared to widows and other women in female headed households. It has been found that female headed households have smaller family sizes than male headed households (Geisler et al, 1985 and Bumbila and Sapuleni, 1984), and this could account for the larger amount of land accessible to women in female headed households despite their smaller total household land area.

The hypothesis that women in customary land have access to more land than women in settlement schemes on the basis of one being more commercialised than the other is rejected by the regression results. This may mean that the argument that commercialisation of agriculture or increased value of land by expanding cash crop production (Geisler et al, 1985) might reduce

the amount of land accessible to women is not confirmed by these results. However, the non-significant results could also be caused by the type of data collected. The study district as a whole is said to be highly involved in cash crop production and most male headed households, whether in customary land or settlement schemes, are engaged in some sort of cash crop production. The assumption that agriculture is less commercialised in customary land than settlement schemes does not seem to be true in this case. The other explanation could be that the behaviour of men towards the allocation of land to their womenfolk is the same no matter what type of land tenure system they are in.

4.3 LIMITATIONS OF THE DATA

The biggest limitation of data is related to the collection of reliable input and output data. The respondents kept sketchy or no records and they relied mostly on memory to answer questions. The situation was made even worse by the fact that data requested was for 1990/1991 season instead of 1991/1992 season which was affected by drought. Apart from the quantities of inputs used and outputs harvested and sold, many farmers could not remember well the prices at which they bought their inputs or sold their outputs. The author had to rely on official prices since prices were still controlled by the government.

Apart from the family composition, most women farmers could not give an accurate figure of labour used on their fields,

especially the married women whose available labour alternated between the husband's fields and their own.

Another limitation of the data is the fact that only field crops figures were considered despite the fact that a few women were involved with vegetable production. This was in order to even out the differences in production brought about by the type of land. By excluding income from vegetable production which was only present to women with parcels of land near rivers or dams, it was possible to assume that the type of land for all women was similar. Even then it was not possible to take into consideration the differences in soil types.

Another limitation arose from the sampling procedure. In order to reduce transport problems during the rainy season, and also keep the financial requirements within the limited available funds, the sample was not selected using pure random sampling . The camps selected were those in accessible areas only which might have accounted for the fact that some of the variables were not significant in the analysis.

CHAPTER FIVE

SUMMARY OF RESULTS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Results in Relation to Specific Objectives.

The following is the summary of results as shown by the descriptive analysis and regression results.

1. The study supported the hypothesis that women of different categories have access to different amounts of land. Descriptive analysis showed that women in male headed households had access to the lowest area while those in female headed households had access to more land contrary to popular belief. Regression analysis showed that a woman's marital status was an important factor affecting the amount of land she has access to. Widows were shown to have access to the highest amount of agricultural land while married women have access to the lowest amount, supporting the descriptive analysis which showed that widows had access to an average of 4.85ha whereas married women had access to 2.15ha. The amount of land accessible to unmarried and divorced women ranged between that of married women and widows. In addition, the amount of land women had access to was found to be affected by the total area of land owned by the household, household size and the age of the woman. It was found that the bigger the area of the household land the higher the amount of land a woman had access to. On the contrary, increasing household size was found to decrease the amount of land a woman had access to. Older women were indicated to have access to more land than younger women.

2. The hypothesis that there is a relationship between the amount of land accessible to women and their involvement in cash crop production was also confirmed by the results of the study. The descriptive analysis showed that women involved in cash crop production had access to an average of 4.34ha and those not involved in cash crop production had access to only 1.78ha. This indicates that either women involved in cash crop production have the incentive and means of acquiring more land or that women with access to more agricultural land were the most likely to be involved in cash crop production.

3. Though descriptive analysis showed some small differences in the amounts of land accessible to women in the different types of land tenure systems, the regression analysis could not support the hypothesis that women in settlement schemes have access to less land than those on customary land. Assuming that farms on the settlement schemes were more commercialised, the statement by Geisler et al, (1985) that commercialisation of agriculture would reduce the amount of land accessible to women could not be indicated by these results.

4. Descriptive analysis results indicated that women's total agricultural production is positively correlated with the area of land they have access to. This means that women with access to more land are likely to have higher total production supporting what would be logically expected. The same descriptive analysis results, however, showed a negative relationship between the area of land accessible to women and their productivity. Women with access to

more land were shown to have lower output per hectare compared to those with access to less land. This indicates that as the area of land increases women find it difficult to maintain the higher level of input and labour use per hectare and hence the poor productivity. However, descriptive analysis also showed that increased access to land coupled with access to credit could result in higher productivity.

5. Regression results also showed that the type of land tenure security a woman has had no effect on her productivity. This is contrary to the assertion made by Feder et al, (1988) that land tenure security increases productivity through enhancing land and labour improving investments. The results in this study, however, concur with the findings from studies done in Sub-Saharan Africa (Migot-Adholla et al, 1991; and Kosura, 1990) who showed that a higher level of land tenure security had little effect on the farmers' access to credit facilities and increased investments on farms and therefore did not affect productivity. The positive effect of land tenure security on total output, as shown by the descriptive analysis in this study, seems to be caused by its positive correlation to the amount of land women have access to and not by its effect on productivity. Land tenure security was not found to be related to any of the other production resources, like labour use/ha and input use/ha, hence it was not likely to show any effect on women's productivity. The level of decision making power, on the other hand, was found to affect both productivity and total production showing that the control over agricultural activities

and produce was more important in increasing women's productivity than their control over the land parcel.

6. The gender of the head of household was found to affect women's total production and productivity. Women in male headed households were found to have higher productivity than those in female headed households. In the same line the marital status of the woman was found to affect women's productivity. Married women, who are mainly in male headed households, were found to have higher productivity than the unmarried, divorced and widows. Widows were shown to have the lowest productivity. The study, in addition, indicated that the level of purchased input use is significant in increasing women's productivity and total production. However, this study did not show that the level of education and access to extension services by women are important in increasing their productivity and total production. These controversial results could be attributed to the type of data collected as discussed in the limtations of data.

Conclusions

The general conclusion derived from this study is that different categories of women face different constraints in increasing their agricultural production and that policy measures formulated to increase women's production should take this fact into consideration.

Since the amount of land has been shown to affect positively women's total production, and that widows have access to

more land than married women, then the poor productivity of widows and other women in female headed households is not caused by their limited access to land. Other factors that affect agricultural productivity are more important constraints against their increased production than the amount of land they have access to. Actually it is possible to assume that some women do not wish to acquire more land for their use because of their limited access to other productive resources. It is concluded that women in female headed households, especially widows, can only be helped to increase their production and productivity through programmes aimed at improving their access to other productive resources, especially labour and purchased inputs.

The limited access to land has been established as the main factor affecting married women's total production. This conclusion is drawn because of the fact that despite their being shown to have the highest productivity compared to women in female headed households, married women's total production was the lowest. This was probably caused by their having had access to the smallest amount of land. Unlike the widows and other women in female headed households, married women seem to be better-off in terms of availability of inputs and labour, as demonstrated by their high productivity. This means in order to increase their total production, they need to have access to more land. Government policies which will set up ways and means of ensuring that they have access to more land, are more important for them. The fact that land tenure security did not prove to be an important factor

in increasing productivity shows that what matters to most women is to give them access to more land and not necessarily strong control over it. Women seem to be secure enough with their usufruct rights.

The study also concludes that if the government is to encourage women to enter into cash crop production, an issue now very important in these times of Structural Adjustment Programmes, they should ensure that those women who are interested should be given greater access to more land. Since it is said that land is plenty in Zambia, then it should not be an element that discourages women from engaging in cash crop production and the relevant authorities should ensure that appropriate actions are taken.

5.3 Recommendations

In order to achieve the Government's objective of ensuring that women farmers are participants and beneficiaries of development through increasing their agricultural production, as recommended in the Fourth National Development Plan, the following are the major recommendations arising from this study.

1. Married women should be encouraged to acquire land on their own by ensuring that the procedures of acquiring land do not discriminate against them because of their marital status. The recommendation by Himonga et al (1988) that the land allocating authorities should not place emphasis on the requirement that married women applying for land should have a written or oral consent of their husbands is re-emphasized. In addition to this

recommendation, it is recommended that land parcels be registered in both the husband's and wife's names so as to give women higher decision making power in its distribution which could result in their having access to more land than at present.

2. For women in female headed households, especially widows, who have been shown to actually have access to more land but with poor productivity, it is recommended that the government set up projects which will ensure their increased access to purchased farm inputs. To increase their access to these farm inputs the government should encourage the formation and strengtherning of women's groups and more primary societies. The extension workers should encourage more women to join these groups or cooperative societies which will not only increase their access to inputs but also improve their agricultural knowledge.

3. To complement the above recommendation, it is suggested that a study be done to specifically establish whether there are differences in the availability of purchased inputs, credit and technology among women of different marital status. This should be followed by land fertility studies to ascertain whether it is the quality of land women have access to or lack of inputs, credit and technology which is the main cause of the poor productivity of women in female headed households.

Finally, it is also recommended that the Land Act be analysed to find whether there are clauses which discriminate women so that these could be deleted and new laws passed which protect women's land rights.

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APPENDICES

Appendix A.

Questionnaire for Women farmers.

A IDENTIFICATION

1. Respondents identification Number .....
2. District ..... 3. Block .....
4. Camp .....5.Village.....
6. Date of interview .....
7. Name of interviewer .....

B. FAMILY BACKGROUND

8. Age of respondent .....
9. Marital Status : Married , Unmarried, Divorced or Widow.
10. Level of Education : None/ Primary/Secondary +
11. Who is the head of this households? .....

If the respondent is not the head of household:

12 What is the age of the head of household? .....

13 What is the level of education of the head of household?

None/Primary/Secondary +

14. Household composition	Number	Number working in the farm
i) Adult males 15 - 60 years	.....	.....
ii) Adult females 15 - 60 years	.....	.....
iii) Children 10-15 years	.....	.....
iv) Children below 10 years	.....	.....
Total	.....	.....

C LAND OWNERSHIP AND USE

15. How many plots are owned by the household as a whole?

.....

16. What is the total area of land owned by this household?

..... ha

17 How was this land acquired?

Mode of acquisition	Plots	Area	Original owner
Total area			

Codes for mode of acquisition:

1.Purchase 2.Inherited 3.Given 4.Government allocation

5.Rental 6.Others

Codes for original owner:

1.Parent 2.Chief 3. Village headman 4.Government

5.Grandparent 6.Parent in law 7.Uncle 8.Spouse

9.Others.

18. What type of land tenure security is present?

a) Complete rights (Land parcel can be sold by the farmer)

Does the farmer have a legal title deed? Yes/No

b) Preferential transfer rights (the farmer can give away or transfer land to other family members but cannot sell it).

c) Limited transfer rights (farmer may not permanently transfer the land).

D. Land used by women

19. How many plots do you have? .....

What is the area of each plot? .....

What is the total area of the plots? ..... Ha

How did you acquire the plots you farm?

Plot	Area	Mode of Acquisition	Original owner
Total		—	

Codes as in Question 17.

20. What type of land tenure security or land rights do you have?

    a. Short term rights

    b. Long term use rights

    c. Preferential transfer rights

    d. Complete transfer rights

21. Do you cultivate all the area you have? Yes/No

22. If yes, are you satisfied with the size of the area you farm? Yes/No

23. If no, what prevents you from acquiring more land?

    .....

    .....

AGRICULTURAL PRODUCTION

24. What crop did you grow in 1990/91 season?

What were their hectarage?

What yields were realized?

What were the prices per unit of each crop?

Crop	Hectarage	Harvest realized	Yield sold	Price per unit	Total value
Tobacco					
Cotton					
Sunflower					
Maize					
G/nuts					
Pulses					
S/Potatoes					
Other crops					
Total					

5. Crops input data:

What inputs did you use for the crops grown in 1990/91 season?

Details of inputs	Crop		
i) Fertilizers:			
Type 1: Name			
Quantity			
Cost			
Type 2: Name			
Quantity			
Cost			
Others (specify)			
Costs			
ii) Seeds			
Quantity (kg)			
Costs (K)			
Chemicals			
Type 1: Name			
Quantity			
Cost			

Type 2: Name			
Quantity			
Cost			
Type 3: Name			
Quantity			
Cost			
Others (specify)			
Cost			
Labour			
Spraying			
Labour (MD)			
Fertilizer			
Application			
Labour (MD)			
Planting			
Labour (MD)			
Ploughing			
Digging Cost			
Tractor (K)			
Oxen (K)			
Hand (MD)			
Cost			

Weeding Costs			
Mandays			
cost			
Harvesting			
Labour(MD)			
Costs			
Marketing			
Packing			
Materials (K)			
Handling and			
transport (K)			
Others (K)			
Total Production Costs			

F. LABOUR USE

27.How many members of your household do you work with in your fields?*

	Number	Days	Work-days
Adult males 15-60 years			
Adult females 15-60 years			
Children 10-15 years			
Children below 10 years			
TotalWork-days			

* The number of days worked per week and hours worked per day should be asked.

28.Do you hire labour on permanent basis? Yes/ No

29. If Yes, how many are they?

Adult males ..... Adult Females.....

Boys below 15 years .....

Girls below 15 years .....

30. What are their wages?

Adult males ..... Adult Females .....

Boys < 15 years..... Girls < 15 years .....

31.Do you hire casual labour? Yes/No

32. If not, why don't you hire casual labour?

1.Enough family labour.

2.Non availability of casual labour.

3.Lack of finances.

.....

G. CREDIT AVAILABILITY

33. Did you borrow any money for farming purposes or taken farm inputs on credit during 1990/91 season? Yes/No ...

34. From where did you get the facility?

Institution (specify)

Trader

Relative

Friend

Others (specify)

35. For which farming activities did you get the facility for?

Cash crops

Maize

Other food crops

36. If you did not borrow any money for farming purposes during that particular season what were the reasons?

1. Had enough own capital
2. Afraid of the repayment burden
3. Did not know where and how to get it
4. Had applied but not given
5. Others (Specify).

.....

H. ACCESS TO EXTENSION SERVICES

37. How often did you see your extension officer during the 1990/91 season?

38. Have you ever attended any farmer's course at the Farmer's Training Centre? Yes/No .....

39. Are you a member of any women's group dealing with agriculture? Yes/No .....

I. DECISION MAKING

40. Who makes decision on the types of crops to be grown in your plots _____

41. Who makes decisions on the various expenditures towards farming and other family expenditures _____

42. Who makes decision on sales of farm produce?_____

43. Who controls the money obtained from produce sales?

_____

Appendix B. Map of Zambia Showing Provinces and Districts.