

**A STUDY OF THE EFFECTS OF LIBERALISATION OF AGRICULTURAL  
INPUTS MARKETING SYSTEM ON INPUTS USE IN MAIZE PRODUCTION:  
A CASE OF IRINGA RURAL DISTRICT**

**BY**

**RICHARD SHONGOY MOSHY SIRILI**

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ONLY**



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## ABSTRACT

The study examined the effects of liberalisation of agricultural inputs marketing system on inputs use in maize production in Iringa Rural District. The specific objectives of the study were: (i) To identify sources of agricultural inputs for maize and the accessibility of the inputs to smallholder farmers. (ii) To identify smallholder farmers' requirements for inputs and the level at which the requirements were met by the existing supply system. (iii) To identify the main constraints faced by smallholder farmers in obtaining agricultural inputs under the present supply system. (iv) To assess smallholder farmers attitude towards private input supply system, and (v) to identify and describe constraints faced by extension workers in delivering extension services to smallholder farmers in a liberalised inputs market system. The study used a cross-sectional design which involved collecting data at one point in time from a selected sample of respondents. Data were collected using an interview schedule supported by observations, and informal discussions with key informants. The study population comprised maize growing farmers in Iringa Rural District. The sampling frame consisted of smallholder farmers who had been growing maize for more than two seasons prior to data collection. A simple random sample of 92 respondents was picked using a table of random numbers from four villages that were randomly selected from a list of potential maize growing divisions in Iringa Rural District. The results of the study show that the main sources of agricultural inputs to farmers were private input suppliers and traders stationed in the urban areas of the District. However, inputs were not accessible to farmers due to low purchasing power, unavailability of inputs in the rural areas and lack of credit. The analysis of the data revealed that farmers had abandoned use of basal fertilisers in maize production in favour of top dressing fertilisers because of high prices of fertilisers. Furthermore, the proportion of farmers using agricultural inputs had declined after the reforms. The research findings showed that although low purchasing

power, unavailability of inputs and lack of credit were the main factors limiting accessibility of inputs to farmers, discussion with key informants revealed that low prices for maize is also an important factor discouraging farmers' use of agricultural inputs. Farmers and extension workers perceived the agricultural input marketing system after reform as poor compared to its performance before the reform due to the following reasons (i) supply of inputs was not reliable (ii) input prices were too high and unstable (iii) quantities of inputs supplied at a time were inadequate (iv) inputs supplied by some of the traders were of low quality (v) inputs were not accessible to farmers through credit. Recommendations pertaining to this study are presented in chapter five.

## DECLARATION

I, Richard Shongoy Moshy Sirili, do hereby declare to the Senate of Sokoine University of Agriculture that the work presented here is my own creation, and has not been submitted for a degree award in any other University.

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## DEDICATION

To my parents, Cyril Tamamu Makari Moshy and Mary Athanas Matemu, who laid the foundation for my education.

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## LIST OF ACRONYMS

AISCO	Agricultural and Industrial Supplies Company
CRDB	Cooperative and Rural Development Bank
DALDO	District Agricultural and Livestock Development Officer
EPD	Economic Planning and Development
ERP	Economic Recovery Programme
ESAP	Economic and Social Action Programme
ESRF	Economic and Social Research Foundation
FAO	Food and Agricultural Organisation
GDP	Gross Domestic Product
HIID	Havard Institute for International Development
IDC	Iringa District Council
IMF	International Monetary Fund
MAC	Ministry of Agriculture and Cooperatives
MDB	Marketing Development Bureau
NAEP II	National Agricultural Extension Project Phase II
NBC	National Bank of Commerce
NBS	National Bureau of Statistics
NMP	National Maize Project
OGL	Open General Licence
RALDO	Regional Agricultural and Livestock Development Officer
PANNAR	Pannar Seed (Pty)
SACCOs	Savings and Credit Coperative Society
SAP	Structural Adjustment Programme
TANSEED	Tanzania Seed Company

TFA	Tanganyika Farmers Association
TFC	Tanzania Fertiliser Company
TRDB	Tanzania Rural Development Bank
URT	United Republic of Tanzania

## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background Information

Tanzania is predominantly an agricultural country and its social and economic development is highly dependent on agricultural development (Rutatora and Rutachokoziwa, 1995). According to the agricultural policy of Tanzania (MAC, 1997a), agriculture is central to the economy of Tanzania and will continue to be so for the foreseeable future.

Although Tanzania attained her independence in 1961 her economic structure has basically not changed (Howlett and Nagu, 1997). The majority of people still live in the rural areas depending upon agriculture for their livelihood. This dependence is reflected in the country's economy where today about 84 percent of Tanzania's over 28 million inhabitants are employed directly by the agriculture sector (Howlett and Nagu, 1997; Nkonya, *et al*, 1999). The sector is also responsible for over 50 percent and 60 percent of the GDP and export earnings respectively (MAC, 2000).

#### 1.2 Agricultural Production in Tanzania

Agricultural production in Tanzania is dominated by the smallholder sector (Mattee, 1989). This sector accounts for about 75 percent of the agricultural export earnings and over 80 percent of the value of marketed cereal production (FAO, 1989; Hella, 1992; Dabek, 1994 and MAC, 2000). According to Ishuza (1986), agricultural production in Tanzania declined drastically between 1972 and 1980.

During this period agricultural output grew at a low rate of 3.7 percent with food crops growing at a rate of five percent and cash crops declining at a rate of 3.5 percent. Similar observations were reported by Msambichaka *et al.*, (1983), Minde, (1991) and Msambichaka and Naho (1995). A number of causes have been attributed to the low production experienced in the 1970's. Howlett and Nagu, (1997) attributed the decline to the shift of resources from agriculture to the manufacturing sector, villagization programme, government interventions in the economy and low commodity prices for Tanzania traditional export crops. Other factors include poor extension services, low use of technology by farmers, insufficient and untimely supply of agricultural inputs and some policies such as the pricing theory which acted as a disincentive to farmers (Shayo, 1990).

Due to the low agricultural output growth the country experienced increased food imports since 1974, low per capita income, low volume of exports and shortages of foreign exchange to purchase essential imports.

Agricultural production started to regain after Tanzania started to implement economic reforms. According to FAO (1989); Bagachwa *et al.*, (1995); Kashuliza and Mbiha, (1995); Msambichaka and Naho (1995) and URT (1986; 1987; 1988; 1989; 1994) reports, considerable increase in agricultural production has been recorded during the reform period particularly on food crops such as maize and rice. They attribute the increase in production to good weather, better producer prices and access to markets and partly due to availability of agricultural inputs. Besides the above observations, (URT, 1988; 1989 and 1994) contend that unreliable agricultural inputs supply have remained to be a problem hindering increased production.

### 1.3 Food Production in Tanzania

According to the National Agriculture Policy of 1997 (MAC, 1997a) the role of providing food to all Tanzanians is the foremost objective of the agriculture sector. FAO, (1980) estimated that 61 percent of all agricultural activities in Tanzania are concerned with food production. However, while food production in Tanzania is difficult to quantify since no one knows with certainty the level and trend of per -capita food production (Johnson, 1989); available data show that very small volume of food were imported during the 1960s compared to the 1970s. This means that in the 1960s, the performance of food production in Tanzania was good. Johnson,(1989) further observed that the level and trend of food production in Tanzania was linked with political and macro-economic policies which were prevailing in the country. Similar observations were reported by Bagachwa *et al* (1995); Reed,(1996) and Howlett and Nagu, (1997). One of the major policies is the Arusha Declaration of 1967 which, among other things, involved the nationalization of all the major means of production. The implementation of this policy was followed by series of changes both economical and social that led to the economic crises of the 1970s and 1980s causing a marked decline of both food and cash crop production (Johnson, 1989) The situation was worse for food crops because before 1970 there was no policy to promote production of food crops.

Food self sufficiency production of the preferred cereals, that is maize, rice and wheat was attained in 1985/86 following major changes in macro-economic policies in the country (Hella,1992). The major surplus regions being Arusha, Iringa, Mbeya, Rukwa, and Ruvuma which together produced about 36 percent of the country's estimated production (Hella,1992).

#### 1.4 The Importance of Maize in Tanzania

Maize is the main source of calorie intake for Tanzanians. According to the household budget survey done by the Marketing Development Bureau (MDB) of the Ministry of Agriculture and Cooperatives in 1977, on average maize provides 61 percent of calorie intake of Tanzanians while the remaining 39 percent is supplied by other foods. Similar observations are reported by Kirby, (1994) and Moshi, *et al.*(1997) who reported that maize consumption in Tanzania provides about 70 percent of the energy and 50 percent of protein requirements for the 28 million plus Tanzanians. Moshi, *et al.* (1997) further reported that maize is the most important staple crop and the most common crop produced by the smallholder farmers in Tanzania. Tanzania's maize production accounts for 60 percent of cereal crop acreage estimated at 1.7 million hectares and the per capital consumption of maize is 100 kg per person per year which is the highest in the world.

According to the Ministry of Agriculture and Cooperative's production statistics for the period 1991/92 to 1997/98 (MAC, 1998); in average maize production has been declining. With exception of the 1994/95 season which recorded a production of 2.874 million tons; production has declined from 2.2197 million tons in 1991/92 to 1.8312 million tonnes in 1996/97. (Table 1). Regionalwise, the trend is the same. Taking Iringa one of the big four regions in maize production as an example, maize production has declined by almost 50 percent between 1991/92 and 1996/97 from 309 100 tonnes to 161 100 tons respectively (Table 2). From the above statistics, one can deduce that a shift toward self sufficiency in food production in Tanzania depends to a greater extent on the improvement of maize production.

In 1971 when shortages of food started to surface in Tanzania, the government conceived ambitious maize production programmes which aimed at increasing

production per unit area (Hella,1992). Among these projects was the National Maize Project (NMP) which aimed at assisting farmers to adopt improved production methods through provision of agricultural inputs on credit basis (Hella,1992).

Despite all these efforts by the government, average maize yield per hectare of maize is still very low when compared to the neighbouring countries (Table 3 and 4). Marandu, *et al.*(1988) and Lyimo, *et al.*(1994) attributed this trend to insufficiency and delayed supply of agricultural inputs, lack of credit facilities to farmers, high input costs and unreliable marketing channels coupled with inefficient extension system as the major constraints to the adoption and full utilisation of recommended production technology and hence low production for most of the food crops in the country.

Table 1: Production of major cereal crops in Tanzania ('000 tons) for the period 1991/92-1997/98

Year/crop	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	1997/98*
Maize	2219.7	2267.0	2188.1	2874.4	2648.2	1831.2	2750.0
Sorghum	587.1	719.1	473.0	838.8	872.4	498.5	673.2
Millet	451.8	424.1	435.3	342.0	585.0	347.0	195.0
Paddy	393.1	640.9	654.5	622.6	806.8	549.7	811.5
Wheat	65.8	83.5	59.7	75.3	83.6	78.5	110.5

Source: Ministry of Agriculture and Cooperatives, (1998)

\* Estimates

Table 2: Maize production of selected regions in Tanzania ('000 tons) for the period 1991/92-1997/98.

Region/year	91/92	92/93	93/94	94/95	95/96	96/97	97/98 *
Arusha	160.9	133.2	63.6	172.2	169.9	14.3	367.0
Iringa	464.9	399.9	326.3	266.0	318.0	291.1	562.3
Mbeya	287.7	286.6	213.0	315.9	218.1	214.8	252.6
Rukwa	217.2	190.4	201.8	136.4	204.6	197.1	173.6
Ruvuma	230.8	214.4	141.1	202.6	212.7	211.8	180.9
Shinyanga	187.5	269.4	374.8	479.3	332.0	243.6	218.1
Tabora	81.6	56.6	116.3	186.0	139.5	61.7	102.2

Source: Ministry of Agriculture and Cooperatives,(1998)

\*\* Estimates

Table 3: Average maize yield in kg/ha. of selected countries in the world, 1970-85

Year	Tanzania	Zimbabwe	Kenya	Africa(average)	USA
1970	1857	1202	1468	1108	4544
1975	1121	1758	1728	1358	5421
1980	1233	1340	1200	1443	5712
1985	1218	1782	1736	1476	7406

Source: FAO, (1985)

Table 4: Average maize yield in kg/ha. in Tanzania, for the period 1991/92-1997/98

Year	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97	97/98*
	1173.6	1448.1	1357.6	1629.8	1617.3	1170.8	1300.0

Source: Ministry of Agriculture and Cooperatives, (1998).

\* Estimates

### 1.5 Government policy changes towards economic recovery

The first attempt by the government to tackle some of the factors which were affecting the economy as mentioned earlier was through the National Economic Survival

Programme (1979-1982) (FAO, 1991). This was followed by a more comprehensive Structural Adjustment Programme (SAP) in 1982-1984 which was directed towards a more market oriented economy (Mbelle, 1991; Howlett and Nagu, 1997). However, none of these programmes had much positive impact on the economic performance in the country basically due to the inadequate resources for which they were based (Kashuliza and Mbiha, 1995; Reed, 1996).

In 1986, Tanzania formed an agreement with the IMF on the principles of the Tanzania's future economic policies. This provided the required external finances for the implementation of the Economic Recovery Programme (ERP) which was launched in 1986, followed by Economic and Social Action Programme (ESAP) in 1989/90-1991/92 (Wangwe and Luvanga, 1990; FAO, 1990; Ndulu, 1993). These programmes included a number of major economic reforms to the national economy including liberalisation of markets, privatisation of state assets and parastatals, adjustment of exchange rate and devaluation of Tanzania Shilling, removal of price control over consumer goods, reform of trade policy and liberalisation of import tariffs, and liberalisation of food market. Other policy reforms implemented during the recovery period were gradual removal of price subsidies on export crops, staple foods and farm inputs with the aim of promoting efficiency in resource allocation (Kashuliza and Mbiha, 1995).

Generally a substantial growth in Tanzania's economy has been achieved as a result of the implementation of the Economic Recovery Programmes from 1996. Total output performance as measured by GDP increased in real terms to an average annual rate of

over 3.9 percent and there was a net gain in per capita income. There was a substantial growth in the production of major food crops though an increase in export crop production was modest. However, review of empirical studies on the impact of structural adjustment policies on farmers and agriculture presents some emerging evidence that there is a reduction in farm input use, reduction in cultivated acreage and abandoning or switching from production of export crops to food crops which requires less inputs and are easily marketed locally (Kashuliza and Mbiha, 1995).

In short, the performance of the agricultural sector in Tanzania has been fluctuating throughout the period of structural changes in the economy. Perhaps this is because the agriculture sector is more exposed to the vagaries of reforms than other sectors due to its operating complexities and the nature of the reforms themselves. It suffices to note that the increase in production which has been recorded during and after the economic reforms is related more to increase in land under cultivation than real productivity increase which was expected as a result of the economic reforms.

## **1.6 Problem Statement**

The implementation of the economic reforms and structural adjustment programmes in Tanzania has both positive and negative effects on the agriculture sector (MAC, 1997a). Positive aspects of the reforms include the opening up of the sector for private investment in production and processing, input importation and distribution, and agricultural marketing. Farmers are now free to sell their produce to the Cooperative Unions or private traders and as a result of competition, nominal producer prices of both food and export crops have increased significantly. Similarly, farmers are no longer confined to a single source for their agricultural inputs. However, the withdrawal of the government and its parastatals from the provision of agricultural services to

farmers has not kept pace with the private sector's ability to participate effectively in taking over the roles which were played by the public sector (MAC, 1997a). On the other hand, prices for most of the essential inputs such as fertilizer has increased significantly as a result of the removal of input subsidies and seasonal credits, and high transportation costs (URT, 1992; Mpango 1994; URT/World Bank, 1994; Hella, 1995; MAC, 1997a). Because of the poor transportation and communication network in the country, private inputs traders or dealers confine their operations in easily reached places where they can maximize profits. This makes agricultural production both difficult and costly especially to the smallholder farmers (MAC, 1997a).

Although the main objective of the reforms in the agricultural sector is to increase agricultural output and productivity by improving services to farmers through improved producer prices, inputs availability, and improved market structure (Msambichaka and Naho, 1995; Howlett and Nagu, 1997; URT, 1999a; MAC, 2000), it is not yet clear whether in the rural areas and particularly the smallholder farmers are being accorded better services by the private sector as it was intended. It is because of these aforesaid reasons that an inquiry into the effects of liberalisation of inputs marketing system on production merits a consideration.

### **1.7 Justification of the Study**

Although positive aspects such as marketing for agricultural products and more sources for agricultural inputs to farmers have been recorded over the involvement of the private sector in agriculture; the private sector in Tanzania is still undeveloped and incapable of handling all the services which were previously under the public sector (MAC, 1997a; URT, 1999a; MAC, 2000). Following the reforms, both the cooperative unions and financial institutions including Cooperative and Rural Development Bank (CRDB) and the National Bank of Commerce (NBC) were also reformed and this

affected their ability to provide credit to farmers. The removal of subsidies on essential inputs resulted in an increase in the price of these inputs (URT/World Bank, 1994; Hella, 1995; URT, 1999a) while producer prices have remained practically unchanged. Many private companies and traders showed an interest or participated actively in inputs distribution but because they lacked experience in inputs marketing most of them were pushed out of business (URT/World Bank, 1994). Further more the few companies and traders who managed to remain in business none have shown any interest in operating in the remote rural areas (Ponte, 2000). As a consequence most of the agricultural inputs today are stocked at the easily accessible places mainly towns leaving the remote rural areas unattended where demand for inputs is high. Farmers are no longer certain of getting inputs or have to travel long distances to purchase them. At the same time, high input prices and lack of credit impair their access to sufficient quantities to meet their demands. Since this study intends to examine the effects of inputs market liberalisation, its findings are expected to shed light to both development planners, policy makers, extension services and inputs suppliers on some important aspects for improving inputs distribution, control and regulations on inputs use as well as short and long term effects of the system on agricultural production, people's social and economic welfare and the environment.

## **1.8 Objectives of the Study**

### **1.8.1 Main objective**

The main objective of this study was to examine the effects of liberalisation of agricultural inputs marketing system on inputs use in smallholder maize production in Iringa Rural District, Iringa region.

### **1.8.2 Specific objectives**

- i) To identify the sources of essential agricultural inputs (fertilizers, improved seeds and pesticides) for maize and the accessibility of these inputs to smallholder farmers
- ii) Determine the smallholder maize producers' requirements for fertilizers, improved seeds and pesticides and the level at which the requirements are fulfilled by the existing supply system
- iii) Identify main constraints faced by smallholder farmers in obtaining agricultural inputs under the present supply system.
- iv) Assess smallholder farmers attitude towards private input supply system.
- v) Identify and describe constraints faced by extension workers in delivering extension services to smallholder farmers in a liberalised inputs market system.

## CHAPTER TWO

### LITERATURE REVIEW

This chapter reviews the relevant literature on the effects of liberalisation of agricultural inputs marketing system on agricultural production. It covers such aspects as the evolution of macro economic policies in Tanzania, economic reforms which are being implemented in Tanzania, an overview of agricultural inputs industry and its contribution to agricultural development, and the nature and relationship that exist between extension services and agricultural inputs in the development of the agriculture sector in Tanzania.

#### 2.1 Historical Evolution of Macro Economic Policies

In terms of economic structure of Tanzania, agriculture is the major economic activity (URT/World Bank, 1994; Howlett and Nagu, 1997). At independence the economy of Tanzania was export-import oriented with economic activities concentrated in primary production which dominated both the Gross Domestic Product (GDP) and the imports. According to Wangwe and Luvanga (1990), agriculture alone accounted for 50 to 60 percent of the GDP while industry and manufacturing accounted for only 5 and 3.6 percent respectively.

Since the late 1960s a major attempt has been made to change the structure of the Tanzania economy (Bagachwa *et al.*, 1995). Government policies started to favour investments and shift of resources to the modern sectors of economy especially manufacturing. Although the Arusha Declaration emphasized the role of rural development, much of the actual development efforts during the following years were directed towards the modern sector of the economy (Bagachwa *et al.*, 1995).

Economic services, and especially the public service, registered a very rapid rate of growth due to the nationalisation of strategic activities in manufacturing, finance, commerce, export and import trade and crop marketing (Bagachwa, 1991). As a result, the public sector expanded rapidly reaching 425 parastatals in mid 1980s (URT/World Bank, 1994; Moshi, 1995). However, as noted by Bagachwa *et al.*, (1995) and Ndulu (1993) the strategy, while drawing large resources from agriculture and external sources, did not provide the basis for sustainable development and the contribution share to the economy started to decline from the early 1980s.

## **2.2 Period of Economic Reform**

Tanzania's economic performance started to weaken in late 1970s and by early 1980s, the country plunged into an economic crisis (Reed, 1996). Both external and internal factors were responsible for this change. Among them is the world economic downturn, the war with Uganda in 1979 and two successive droughts in 1981-82 and 1983-84 (Bagachwa *et al.*, 1995; Reed, 1996). Internal factors were mainly due to wrong choice of development policies, strategies and resources (Bagachwa *et al.*, 1995; Reed, 1996). Specifically they include neglect of the agriculture sector, over emphasis on large scale and capital intensive industries, excessive government intervention in the economy, inefficient state controlled transport and marketing system which stagnated agriculture (Bagachwa *et al.*, 1995; Reed, 1996). These economic problems resulted into a shift towards a more market oriented policies from early 1980s (Reed, 1996).

Economic reforms and market liberalisation have brought many changes in the country (URT, 1998a). More relevant to the study, however, is the liberalisation of the food marketing beginning 1984, fertilizer and seed marketing in 1990, liberalisation of importation of other agrochemicals such as pesticides in 1987, and liberalisation of

cash crop marketing beginning 1991/92. Other changes include the gradual removal of subsidies on farm inputs and the restructuring of the crop marketing system by redefining the roles of cooperative unions, crop marketing boards and food marketing parastatals (URT/World Bank, 1994; Kashuliza and Mbiha, 1995).

## **2.3 An Overview of Agricultural Inputs Industry in Tanzania**

### **2.3.1 Fertilizer demands and distribution**

Up to 1969 the requirements for chemical fertilizer in Tanzania were met through imports (FAO, 1989). The consumption of this fertilizer was entirely confined to large-scale farms (FAO, 1989; Hawassi, 1997). After the nationalisation of private companies in 1967, procurement of fertilizers was confined to the Tanzania Fertilizer Company (TFC) which was formed in 1968. Tanzania started to produce fertilizer locally in 1972. Until 1981 local production contributed about a half of the Tanzania's total fertiliser requirements, the remaining half coming from commodity aid grants (URT/World Bank, 1994). However, due to financial and technical problems the fertiliser plant was closed in 1991. Since the time Tanzania started to implement economic reforms, fertiliser grants became less available to the government because most of the donors transferred their balance of payment support from commodity aid to foreign exchange assistance under the Open General License (OGL) (URT/World Bank, 1994). Following complete liberalisation of fertiliser marketing in 1990, private companies were allowed to import and distribute fertilisers in the country. The first private companies to enter the market were Tanganyika Farmers Association (TFA) and Mohammed Enterprises in 1992. By 1996/97 season there were ten private companies in operation (MAC, 1997b). Currently the main problems facing private companies interested in fertiliser marketing are difficulties in securing subsidy funds from the government or credits from financial institutions and lack of experience in fertiliser marketing (Bagachwa *et al.*,

1995; MAC, 1997b).

Before fertiliser market liberalisation, fertiliser supply and distribution was done by TFC and the Tanzania Rural Development Bank (TRDB) (Turuka, 1995; Hawassi, 1997). TRDB was responsible for provision of credit for fertilizers for crops which were covered under crop production credit programme, while TFC was responsible for distribution of domestically produced fertiliser and fertiliser obtained through commodity aid (Turuka, 1995; Hawassi, 1997). While TRDB distributed fertiliser through cooperative unions, TFC distributed their fertilisers through their regional depots and agents such as Agricultural and Industrial Supplies Company (AISCO) and TFA (Mahundaza *et al.*, 1992). The establishment of crop authorities in 1976 following the dissolution of Cooperative Unions provided another channel for TFC to distribute fertilisers (FAO, 1989; Turuka, 1995). By 1984, following the re-establishment of Cooperative Unions, most of the fertiliser was distributed by the Cooperative Unions leaving small quantities to secondary agents such as AISCO and Crop marketing boards. By this time TFC was the sole producer and importer of fertilizers while CRDB (formerly TRDB) was responsible for the provision of input credits to cooperative unions and crop boards (Turuka, 1995). Although fertiliser marketing was liberalised in 1990; private fertiliser retailers joined the business in 1988/89 season under TFC contract following deconfinement of fertiliser distribution and failure by cooperative unions to distribute fertilisers due to financial problems (URT/World Bank, 1994). Private retailers emerged rapidly in the Southern Highlands and by 1992/93 season there were 90 retailers in Iringa region alone. Currently the number has been declining with the declining fertilizer consumption in the Southern Highlands. According to the Ministry of Agriculture and Cooperatives report (MAC, 1997b), fertilizer consumption in the Southern Highlands has declined from 70 percent of the country's total consumption in the early 1990s to

37 percent in 1996/97 season. The main reasons for the decline in consumption are higher fertilizer prices, low producer prices and the collapse of the Cooperative Unions which used to give credits to farmers (MAC, 1997b; MDB, 1997).

### **2.3.2 Production and distribution of improved maize seeds**

Improved seeds is another critical input for increased farmers production. While fertilisers and other agrochemicals such as pesticides are wholly imported, about fifty percent of the improved seeds requirement in the country is met through local production (MAC, 1997b). In the 1996/97 season for example out of 12 800 tonnes of improved seeds which were available at the market, 5 037 tonnes were produced locally (URT, 1998b). Prior to seed industry liberalisation, Tanzania Seed Company (TANSEED) was the sole producer, importer, distributor and seller of improved seeds (MDB, 1997; Howlett and Nagu, 1997). Seed industry was liberalised in 1990 and the private sector was allowed to enter into production, distribution and marketing of improved seeds. Cargill was the first private company to enter the market followed by PANNAR Seed (Pty) and Pioneer Hybrid International (MAC, 1997b; Howlett and Nagu, 1997; URT, 1998a). Out of the three private companies only Cargill produce maize seeds locally. While seed industry liberalisation has improved the availability in terms of volume and number of varieties of improved seeds, consumption of improved seeds is reported to be on the decline. Data from the Ministry of Agriculture and Cooperatives (MAC, 1997b) show that there is a decline in maize seed production and sales for both TANSEED and Cargill. Poor seed quality and the collapse of the secondary distribution for TANSEED are associated with decline in TANSEED sales while decline in effective farmers demand is associated with Cargill's decline in maize seed production (MAC, 1997b).

### **2.3.3 Distribution of other agrochemical**

Unlike fertiliser and seeds, primary procurement of other agrochemical such as pesticides and herbicides was not monopolized by any institution even before Tanzania officially liberalised its importation in 1987 (MAC, 1997b). Both private and public institutions were able to import final products or ingredients for local formulation through AISCO (MDB, 1997). AISCO was charged with the endorsement of importers of agrochemical before Bank of Tanzania issues them with import licenses (MDB, 1997). The volume of imported agrochemical dropped significantly since 1993/94 season (MAC, 1997b). The main reason was the breakdown of the state distribution system which was dominated by cooperative unions. Following complete liberalisation, marketing of agrochemicals is dealt with through commercial private channels. Some problems have been observed in association with private sector participation in marketing of agrochemicals (MAC, 1997b). These include lack of control and monitoring on the use of agrochemicals at secondary level distribution, presence of sub-standard and adulterated products in the market and frequent changes in brand names which bring confusion among farmers as they lack knowledge on active ingredients. Currently, efforts are being made by the government, that is the Ministry of Agriculture and Cooperatives to ensure that regulatory mechanisms are in place.

## **2.4 Contribution of Farm Inputs to Agricultural Production**

Agricultural transformation has been viewed as a four-stage process (Caliendo, 1979). The first stage is the traditional farming which relies on traditional farming practices. The second stage uses more improved methods to improve farming such as fertilizers and timing of crop production. The third stage is characterized by the introduction of scientifically developed techniques while the fourth stage involves the structural transformation of the rural and village economy, including the changes in the whole

range of institutions and infrastructure needed to support high productivity in agriculture. Rapid agricultural development therefore requires rapid development and spread of improved technology such as farm inputs and technical know-how to educate and convince farmers to adopt improved production methods. In response to this, the introduction of improved technology in agriculture has been given priority in most of the developing countries. Both national and international institutions, such as research, have become seriously involved in promoting the adoption of improved technologies in smallholder agriculture (Hawassi, 1997). Despite all these efforts, available information (MAC, 1997a) shows that agricultural production level in Tanzania is still far below the production levels which can be reached with the existing technologies and available resources. According to Hawassi, (1997), the continued low yield levels obtained by farmers, despite the availability of modern methods of production are due to failure by farmers to adopt these technologies. He further pointed out that the crucial reason for low adoption is the inappropriateness of such innovations to the farmers' circumstances. Lyatuu (1994), and Lupatu (1995), related the poor performance of the agriculture sector to failure by farmers to use modern agriculture technology and inefficient extension services. They argued further that modern agricultural technologies imply greater operational costs which in turn put additional strain on the farmers' financial and labour budget. Similar observations were reported by Marandu *et al.*, (1988) and Ashimogo, (1995), who identified lack of access to and delay in supply of improved seeds, fertilizers and other essential agrochemicals as the main constraints to increased production and the major factor explaining the low yields among farmers in Tanzania. However, more relevant to this study is the fact that the cost of modern production technologies and associated risks constraint the ability of smallholder farmers to move to higher levels of production technology. This is because smallholder farmers are extremely sensitive to the cash requirements of improved technologies and

thus will reduce their use or switch to alternative crops when agricultural produce prices fall (Blackie, 1990).

## **2.5 The Role of Extension Services**

The availability of agricultural inputs alone cannot bring about the desired agricultural production in Tanzania. The best ways of utilising such inputs has to be developed under conditions which will be appropriate to Tanzanian farmers' circumstances. While research can take care of such problems in a well-defined microenvironment, agricultural extension services is necessary to disseminate what has been generated by research to the farming population (URT/World Bank, 1994). Prior to the liberalisation of the inputs market, the public sector played a major role in the delivery of agricultural inputs to farmers often through extension services (MAC, 1983; FAO, 1989; Howell, 1988). After liberalisation extension assumed its basic role of information dissemination leaving inputs to the private sector.

According to Osburn and Schneeberger (1983) the demand for agricultural extension is derived from demand for input such as fertilizer. The existing relationship in this case is complementary implying that consumption for farm inputs cannot be affected without extension services. From the economic point of view, the change in consumption of agricultural inputs due to change say in macro-economic policies will be accompanied by similar change in consumption of extension services which is a complementary service to farm inputs (Hella, 1995). Therefore, the successful introduction of improved technologies relies heavily on the reliability of an agricultural inputs supply market (URT/World Bank, 1994).

## **2.6 An Overview of Agricultural Production in Iringa Region**

Agriculture in Iringa region is the major economic activity of the people, contributing more than 85 percent of the regions GDP and employs more than 90 percent of the regional population. According to Iringa Regional Commissioner's Office reports,(1998), although land is the major potential resource for Iringa region and more than 90 percent of the regional population depends on agriculture for their livelihood, it is only 11 percent of the regions arable land is under cultivation. The report further contends that crop production levels are still very low especially for food crops. The low levels of food production are attributed mainly to the frequent use of inferior agricultural implements, application of outdated agricultural methods, pest problems, declining soil fertility, non availability of agricultural inputs and sometimes low purchasing power of the people which tends to discourage the use of modern but expensive agricultural inputs or implements.

### **2.6.1 Maize production in Iringa Region.**

Maize is both a major food crop and the most important marketed crop in Iringa region (in volume terms). Its importance is not only vital to the region but its levels of production in the region is also an important determinant factor of the national maize surplus (Iringa Regional Commissioner's Office, 1998). Although Iringa region is generally reputed for high crop yields and hence qualifying for the "Big Four Club" (Maize surplus regions), its production levels are still very low especially yield per unit area. For example in 1996 season, maize harvests in Iringa averaged two tonnes per hectare against a normal capacity of 6.5 tonnes of maize per hectare. (Table 5). Having being a maize surplus region where all efforts and the necessary assistance have been made by both the regional authorities and the National government, one would have expected a better yield of maize per hectare (Iringa Regional Commissioner's Office,

1998).

Table 5: Average cereal yield in kg/ha in Iringa Region 1996

Crop	Productivity (kg/ha.)	Attainable (kg/ha.)	Under utilised.(kg/ha)
Maize	2000	6500	4000
Sorghum	1500	-	-
Paddy	2000	4500	2500
Wheat	1200	3000	1800

Source: Iringa Regional Commissioner's Office, (1996)

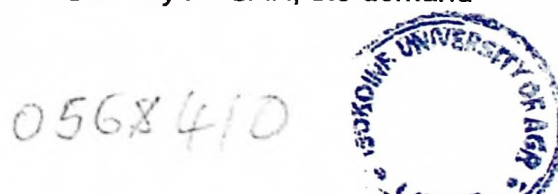
Table 6: Growth in production of selected food crops in Iringa Region for the period (1988/89-1994/95)

Crop/Year	1988/89-1990/91	1993/94-1994/95
Maize	-0.11	0.86
Sorghum	1.4	1.17
Paddy	-0.10	2.20
Wheat	0.03	0.19
Beans	0.61	0.97
Cassava	3.20	0.94

Source: Planning Commission, DSM, (1996)

## 2.7 Demand and Distribution of Farm Inputs in Iringa Region

According to available reports, the use of commercial fertilizers and other inputs in Iringa region is increasingly becoming limited by the ever escalating prices of these inputs. According to reports from the Region's Planning Department (1995) and RALDO's office (1995); quantities of agricultural inputs distributed to the end users, that is farmers, falls far short from the demand and supply of the same inputs. For example in 1993/94 season, only 1530.8 tonnes (7.2 %) of Triple Super Phosphate (TSP) were distributed to farmers out of a demand of 21 300 tonnes. Similarly for CAN, the demand



was 28 835 tonnes but only 7 954.1 tonnes (27.6 %) were available and out of that only 6 752.7 tonnes (23.3 %) were supplied to farmers. The same trend applies for Urea, certified seeds and pesticides (Table 7 and 8). This implies that even if farmers were able to purchase these inputs irrespective of the high prices; only a few could have managed since they were not available to them. Without adequate supply of inputs, there is no way farmers can make miracles in their production (Regional Commissioner's Office, 1998). It is therefore important to note that so long as farmers have been using improved inputs, they will have to continue doing so even more intensively in order to get good and better yields.

## **2.8 Demand, Supply and Distribution of Inputs in Iringa Rural District**

Iringa Rural District just like the region, is experiencing decline in crop production especially in food crop production. Several factors have been attributed to this trend. Among the factors are; declining soil fertility, pests and disease infestations, and misuse of pesticides. Other factors include institutional problems such as unreliable and inefficient marketing system, high prices for agricultural inputs, and poor infrastructure especially feeder roads. While misuse of pesticides is likely to cause pesticide resistance, poor feeder roads linking villages and the major trading centers hinder transportation of inputs and produce to and from the villages. (IDC 1997). Available data from the District indicate extreme fluctuations for demand and supply of different types of inputs during 1989/90 season. These fluctuations are attributed to the fluctuations in the prices of commodities produced, coupled with the ever increasing input prices; the two factors which determine the amount of input which the farmer can buy (IDC, 1997). Furthermore, the report contends that the majority of smallholder farmers in the District use seeds from their previous harvests instead of buying new seeds due to high prices of commercial improved maize seeds.

Table 7: Demand, Supply, and Distribution of Selected Chemical Fertilisers in Iringa Region for the period 1993/94-1994/95 (Tons).

Year	1993/94			1994/95		
Type	Demand	Available	Distributed	Demand	Available	Distributed
TSP	21 300	1 759.5	1 530.8	21 300.0	2 179.40	1 878.40
DAP	-	1 418.0	1 354.2	-	1 257.00	1 196.30
CAN	28 835	7 954.1	6 752.0	28 835.0	21 765.20	14 661.25
SA	853	5 164.2	5 153.0	853.0	2 064.05	930.60
UREA	6 680	4 480.95	4 146.0	6 680.0	10 525.35	6 775.00
Total	47 668	20 776.75	18 936.0	47 668.0	37 781.00	24 842.55

Source: Iringa Regional Commissioner's Office, (1995)

Table 8: Demand, Supply and Distribution of Improved Maize Seeds in Iringa Region for the period (1993/94-1994/95) (tons)

Year/	1993/94			1994/95		
Type	Demand	Available	Distributed	Demand	Available	Distributed
UCA	142.0	15.1	9.1	142.0	22.87	22.18
H. 632	74.0	47.2	22.3	74.0	13.21	6.66
H. 614	307.0	65.8	24.7	307.0	272.2	49.12
H.6302	583.0	168.1	31.1	585.0	152.0	73.52
CG	40.0	2.17	0.19	40.0	18.3	3.3
TMV	40.0	43.0	15.0	75.0	-	-
KITO/KILIMA	96.0	-	-	40.0	2.1	2.1
Total	1282.0	341.37	102.39	1263.0	480.68	156.88

Source: Iringa RALDOs office (1995)

Table 9: Demand, Supply and Distribution of Pesticides in Iringa Region for the period 1993/94 - 1994/95.

Year/type	Demand	1993/94		Demand	1994/95	
		Available	Distributed		Available	Distributed
Sumithion 50 EC*	362.0	126.0	62.0	1600.0	725.0	525.0
Actellic s/dust	7.02	6.12	4.47	10.6	6.0	3.29
Thiodan 35 EC*	1200.0	752.0	596.0	807.0	425.0	304.0
Actellic 50 EC*	670.0	506.0	404.0	1500.0	375.0	285.0

Source: Iringa, RALDO's office, (1995).

\* Volume in litres

This chapter has summarised the background information about the evolution of macro economic policies in Tanzania since her independence in 1961. The summary also include an overview of agricultural inputs industry in Tanzania, the contribution of farm inputs to agricultural production and the roles of extension services in promoting agricultural production. A review of agricultural production and distribution of agricultural inputs in Iringa Region and Iringa District were also included.

The literature indicated that Tanzania had tried various economic policies since her independence with a view to change the structure and improve her economy. However these policies fell short of the expected improvements in the economy leading the country into an economic crisis in early 1980s. Both internal and external factors were responsible for the economic downfall. The major external factors were the world economic downfall, the war with Uganda in 1979, and two successive droughts in 1981-1982 and 1983-1984. Internal factors were mainly due to wrong choice of development policies, strategies and resources. One specific internal factor is the neglect of the agriculture sector and the excessive state control of marketing system which stagnated agriculture.

The following chapter describes the methodology used for obtaining and analysing data relevant to this study.

## **CHAPTER THREE**

### **METHODOLOGY**

This chapter describes the methodology used for obtaining and analysing data relevant to this study. The chapter includes a description of the study area, research design, population, sample size, method of data collection and analysis.

#### **3.1 Description of the Study Area**

The study was confined in Iringa Rural District of Iringa Region in the Southern Highlands of Tanzania. Iringa District is located between 7° and 9° south and 43° to 45° east. Iringa District is in the northern part of Iringa region and it borders Dodoma region in the north; Morogoro region in the east, Mbeya region in the west and Mufindi District on the south.

The District is composed of three distinctive agro-ecological zones. These are: The high rainfall lands which lie between 1600 m and 2700 m above sea level. It receives an annual rainfall between 1000 mm and 1600 mm; The medium dry intermediate zone which covers the central part of the District lies at an altitude of 1200 m and 1600 m above sea level with an annual rainfall ranging from 600 mm to 1000 mm. The third agro-ecological zone is the dry northern range which is composed of the lowlands in the north west parts of the District receiving an annual rainfall ranging between 500 mm to 600 mm and is found at an altitude of 900 m-1200 m above sea level.

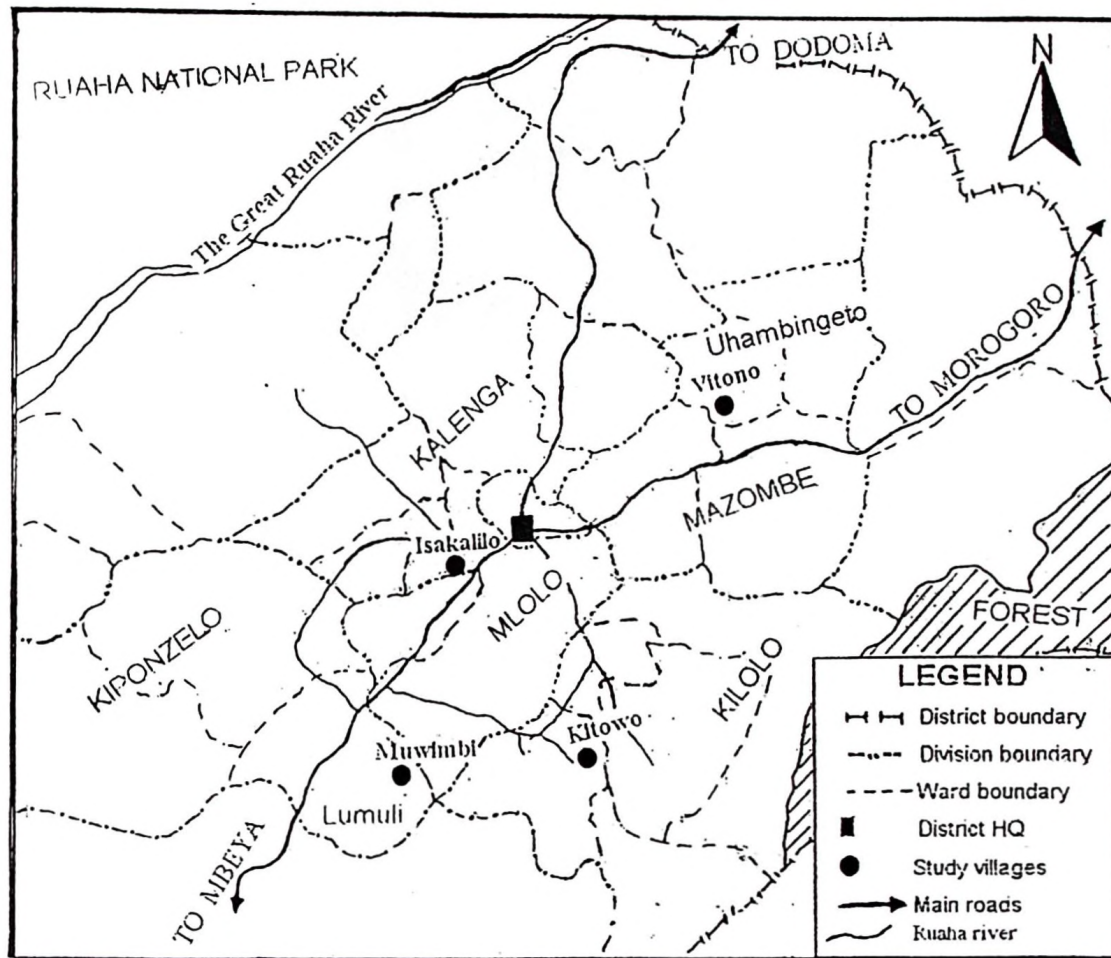


Figure 1. Iringa District: Location of the surveyed villages.

### **3.1.1 Location of the study villages**

The study focused on four villages namely Isakalilo, Vitono, Muwimbi and Kitowo which were randomly selected from a list of potential maize growing divisions in the District.

The location of the villages is as follows

- (i) Isakalilo village: The village is in Kalenga division about 8 km west of the District headquarters along Iringa -Idodi road.
- (ii) Vitono village : The village is in Mazombe division about 60 km east of the District headquarters and 10 km north of Ilula township and the Dar-Es-Salaam - Tunduma highway.
- (iii) Muwimbi village: The village is in Kiponzero division about 60 km south west of the District headquarters along the Dar-Es-Salaam-Tunduma highway.
- (iv) Kitowo village: The village is in Kilolo division about 65 km south east of the District headquarters and about 20 km south of the Iringa -Udzungwa road.

## **3.2 Research Design**

Data for this study were collected by using a cross sectional design. In cross sectional design, data are collected at a single point in time (Cresswell, 1994). This design is considered useful for descriptive purposes and determination of relationship between variables (Babbie, 1990).

## **3.3 Sampling Procedure**

### **3.3.1 The study population**

The population for this study consisted of smallholder maize growing farmers in Iringa Rural District, who had been producing maize for more than two seasons prior to the time of the study. Four villages were selected from a list of potential maize growing villages in the District using such criteria as accessibility to the villages, financial and

time constraints and agroecological zones suitable for maize production. In addition, extension workers, agricultural inputs suppliers and traders and other key informants were also interviewed.

### 3.3.2 Sampling frame

The sampling frame for farmers consisted of all smallholder farmers producing maize for more than two seasons prior to the time of the study in the selected villages of Isakalilo, Vitono, Muwimbi and Kitowo. These villages were selected randomly from a list of potential maize growing divisions in the District. The sampling units were composed of the heads of households in the selected villages obtained from the village registers. The sample was selected randomly using a table of random numbers.

### 3.3.3 Sample size

A random sample size of 5 percent of the total number of households per village was taken from each of the selected villages to form a total sample size of 92 respondents for the purpose of this study. The number of respondents selected from each villages is presented in Table 10. According to Boyd *et al.* (1981) a random sample should at least constitute 5 percent of the total population to be represented.

Table 10: Distribution of respondents according to villages

Name of village	Total households	5%	Male	Females
Isakalilo	440	22	14	8
Vitono	527	26	22	4
Muwimbi	345	17	10	7
Kitowo	542	27	20	7
Total	1854	92	66	26

In addition, a total number of 11 extension workers were interviewed (8 subject matter specialists at District level, two divisional extension officers out of four targeted and one village extension officer out of four targeted). The divisional and village extension workers who were not interviewed as planned could not be found when data were being collected.

### **3.4 Instrumentation**

Primary data were collected using interview schedules (for farmers) and questionnaires (for extension workers) supported by personal observation, informal discussion and informal interviews with key informants aimed at gathering information and data pertaining to (a) availability and accessibility of agricultural inputs to farmers and (b) determination of farmers and extension workers' perceptions on agricultural inputs marketing reforms.

Three instruments, namely the interview schedule (for farmers) self administered questionnaire (for extension workers) and a check list (for input suppliers) were constructed using closed and open ended questions deemed relevant for this study.

### **3.5 Pre-testing**

Pre-testing of the research instruments under field conditions was done using a randomly selected sample of nine farmers (for the interview schedule) and three extension workers (for the extension workers' questionnaire) who were not part of the final sample. The aim of pre-testing was to check whether the questions were clear, specific and pertinent to the study objectives. Thereafter the initial drafts of the interview schedules and questionnaire were revised basing on the pre-test results.

### **3.6 Data Collection Method**

#### **3.6.1 Primary data**

The primary data were collected by the researcher in the following manner:

(i) Personal interviews with the selected smallholder farmers and (ii) through self administered questionnaires for extension workers. Resercher's personal observation, informal disscussion and informal interviews with key informants were also conducted for purposes of enriching and/or corroborating the findings.

#### **3.6.2 Secondary data**

Primary data were complemented by secondary data which were obtained from the following sources: Iringa District Agricultural and Livestock office, Iringa District Council offices, Iringa Regional Agricultural and Livestock offices, Ministry of Agriculture and Cooperatives and the Sokoine National Agricultural Library.

### **3.7 Data Processing and Analysis**

The record of each interview was inspected for its accuracy immediately after it was completed before proceeding to another respondent. Data were verified by the researcher immediately after the field data collection in order to make sure that interview schedules had been filled in accurately and completed. Data from open ended responses were summarised, similarities as well as differences in responses were examined and noted. The completed interview schedules and questionnaires were coded and then analysed using the Statistical procedures from the Statistical Package for Social Sciences (SPSS) computer programme. From the analysis descriptive statistics such as frequencies and percentages and means were used to obtain the variability and central tendencies of variables.

In summary, chapter three has elaborated the data collection and analysis methods used in this study. The findings of the data analysis are reported in the fourth chapter.

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

This chapter presents and describes the findings of this study. It is divided into the following sections; socio-economic characteristics of the respondents, production and marketing of maize and other crops, accessibility and use of agricultural inputs by smallholder farmers and smallholder farmers' opinions on the performance of the agricultural inputs marketing system after reforms. The chapter also presents the opinions of the extension workers on the current input supply system and the problems which affect delivery of extension services under the present input marketing system.

#### **4.1 Socio-economic Characteristics of the Respondents**

This section deals with the description of socio-economic characteristics of the respondents (smallholder farmers) of the four villages that were studied. Table 11 shows the frequency distribution of the respondents according to their gender, age, education level, household annual income, size of the household, and number of dependants per household.

##### **4.1.1 Gender**

The results (Table 11) reveal that majority (71.7%) of the respondents interviewed were males and the remaining 28.3% were females.

##### **4.1.2 Age**

A greater percentage (33.7%) of the respondents were found in the age category of 31 to 40 years. Only 18.5% of the farmers were below 31 years. Overall the results show that most of the respondents (52.2%) are in the age category of 20 to 40 years .This

suggests that, people are engaged in agriculture at early stages of their adulthood.

#### **4.1.3 Level of education**

Generally the majority (79.3%) of the respondents were literate. Only 20.7% of the respondents had not attended any formal education apart from adult education classes. The results are summarised in Table 11.

#### **4.1.4 Estimated annual income**

From Table 11 it can also be noted that 59.8% of the respondents had annual income of Tshs. 100 000 and above, that is, an average income of Tshs. 8 000 and above per month. This income is relatively high compared to the Iringa District per capita income of Tshs. 97 305 but low in comparison to the Iringa Region per capita income of Tshs. 102 500 and the national average of Tshs. 147 026 (1997 levels) (IDC, 1997, URT, 1999a).

#### **4.1.5 Family size**

In case of family size; the household size and composition indicate a wide variation in as far as the family size was concerned. According to Table 11, 54.3% of the respondents had an average family size of 6-10 members. Generally the majority of the respondents (91.3%) had average family size of 10 members and below. The composition is relatively bigger compared to the the regional average of 5.0 and the national average of 5.6 members per household (Population census, 1988).

From Table 11, it can also be noted that the majority (76.1%) of the households had dependants between 1 and 4, while only 6.6% did not have any. According to Iringa District socio-economic profile report (IDC,1997), Iringa District has a high dependence

ratio of 106.98 making it second to Ludewa District which has a high dependence ratio in Iringa Region. This means that more of the available resources in the District were allocated to provision of social services and food to cater for the dependants requirements rather than for capital formation, thus retarding the economic growth of the District.

Table 11: Distribution of respondents according to socio economic characteristics  
(N=92)

Characteristic	Value	n	%
Sex	Male	66	71.7
	Female	26	28.3
Total		92	100.0
Age in years	20-30	17	18.5
	31-40	31	33.7
	41-50	15	16.3
	51-60	14	15.2
	61-70	12	13.0
	71-80	3	3.3
Total		92	100.0
Education level	No formal education	19	20.7
	Primary education	65	70.7
	Secondary education (O level)	4	4.3
	Secondary education (A level)	2	2.2
	Technical education	2	2.2
Total		92	100.0
Annual income (Tshs)	Less than 100 000	37	40.2
	100 000-199 000	24	26.1
	200 000-299 000	10	10.9
	300 000-499 000	17	18.5
	500 000 and above	4	4.3
Total		92	100.0
Family size (members)	< 6	34	37.0
	6-10	50	54.3
	11-15	6	6.5
	16 and above	2	2.2
Total		92	100.0
Dependants	No dependants	6	6.6
	1-4 dependants	70	76.1
	5-10 dependants	16	17.4
Total		92	100.0

#### 4.1.6 Resource ownership and allocation

##### 4.1.6.1 Sources of income

Table 12 shows distribution of respondents according to their different sources of income. It can be noted from the table that the main source of income to the majority (90.2%) of the respondents was crop production. While only 7.6% of the respondents showed that crop production was their second main source of income, 32.6% indicated animal production as their second main source of income. Only 6.6% of the respondents relied on contribution from other members of the household. The summary of sources of income to the respondents is presented in Table 12.

A study conducted in Njombe and Iringa Rural Districts (Hella, 1995), revealed that crop production and non farm incomes were the main sources of income for most households. The two sources together accounted for 92.7% of the total household income. The study revealed further that villages with high revenue from sales of crops were better off than those with less revenue from sales of crops. This situation indicates that crop production continues to be the main contributor to the farm household income.

Table 12: Distribution of respondent's sources of income by priority (N=92)

Income source	Priority one source		Priority two source	
	n	%	n	% *
Agriculture (Animal production)	4	4.4	30	32.6
Agriculture (Crop production)	83	90.2	7	7.6
Non farm activities	5	5.4	23	25.0
Contribution from other members of the household	-	-	6	6.7
Employment	-	-	-	-
Pension	-	-	1	1.1
No response	-	-	31	33.7
Total	92	100.0	92	100.0

\* Percentages do not add up to 100 as some respondents indicated more than one source of income.

#### 4.1.6.2 Types of crops grown

Table 13 presents the distribution of respondents according to the type of crops grown. As indicated in Table 13, crops grown by the farmers are maize, beans, cow peas, sweet potatoes, tomatoes, sunflower, groundnuts and garden peas. Of these, tomatoes, sunflower and garden peas were grown mainly for commercial purposes while, the remaining crops catered for both commercial and food purposes. According to Table 13, the most commonly grown crop by the smallholder farmers was maize (100%) followed by beans (40.3%), garden peas (28.3%), tomatoes (18.5%) and sunflower (9.8%). The no response category (35.9%) refers to small holder farmers who grow maize only. According to the Expanded Survey of Agriculture for 1995/96 report (MAC/NBS 1999), about 60% of the surveyed households grow maize.

Table 13: Distribution of respondents according to crops grown (N=92).

Type of Crop	n	%
Maize	92	100.0
Beans	37	40.3
Garden peas	26	28.3
Tomatoes	17	18.5
Groundnuts	2	2.2
Sunflower	9	9.8
Cow peas	3	3.3
Sweet potatoes	1	1.1
No response	33	35.9

\* Percentages do not add up to 100 as some respondents indicated more than one crop.

#### 4.1.6.3 Land ownership

Table 14 shows the distribution of respondents according to land ownership and method of land acquisition. It can be observed from Table 14 that majority of the respondents (95.7%) owned land. With regard to the method of land acquisition,

majority (76.1%) of the respondents acquired land through inheritance. Only 4.3% rented land from other villagers since they do not own land.

An informal discussion with the smallholder farmers revealed that in rented farms the level of application of improved technologies in production such as chemical fertiliser was very low either because the owners of the farms prohibit use of such technologies on their farms for fear of side effects to the soil or farmers avoid to invest on farms which they do not own.

Table 14: Distribution of respondents according to land ownership and method of acquisition of land (N=92)

	n	%
Do you own land		
Yes	88	95.7
No	4	4.3
Total	92	100.0
Method of land acquisition		*
Inherited	70	76.1
Allocated by village government	16	17.4
Bought	6	6.5
Rented	4	4.3

\* Percentages do not add up to 100 as some respondents indicated more than one method.

#### 4.1.6.4 The pattern of household expenditure

Table 15 shows distribution of respondents according to the pattern of household expenditure from the household income. Household expenses were divided into four groups. Farm activities (that is land preparation, planting, weeding, and harvesting), farm inputs expenses (that is purchased fertilizer, seeds, pesticides), health and education (medical expenses, school fees, uniforms) and household expenses (purchased food, clothing, household items). Respondents were required to indicate

their expenditure allocation pattern basing on three categories- allocation one, two, and three. Allocation one meant the expense allocated the largest share from the household income while allocation two and three followed in that sequence.

The results as summarised in Table 15 show that Health and education (42.4%) ranked first in category one, while farm inputs (14.1%) ranked last in the same category. In category two, household expenses ranked first (31.5%) and farm inputs (14.1%) was last. In category three, farm activities ranked first (32.6%) and health and education was last (12%). Overall, the results show that health and education account for 74% of the total household expenses, while farm inputs is the least accounting for only 44.5 %. However, 48.9% of the respondents did not respond.

According to results, farm inputs did not rank first in any of the three categories. This implies that farm inputs are less considered by the farmers in the expenditure allocation. For the no response cases the results suggest that in such households there is no expenditure allocation pattern instead whenever income is obtained is directly channeled to the most pressing problem or issues at that particular time. Basing on the fact that very few farmers, if any, keep records of their household expenditures, it is difficult for them to identify specifically what expense claims more money or the least amount among the household expenses. This is shown by the increasing number of no response respondents as one moves from category one to category three.

#### **4.1.6.5 Priorities on household expenditure**

Table 15 summarises responses on household expenditure allocation priority. Overall results show that health and education ranked first by majority (75%) of the respondents in the expenditure allocation priority, while farm inputs was the least

(42.4%). Similarly by looking on the results on the basis of categories of priority, it reveals that health and education ranked first as priority one (41.3%), household expenses ranked first in priority two (30.4%) and farm activities ranked first in priority three (39.1%) in the expenditure allocation priorities.

As the results indicate, health and education and household expenses were the expenditures given top priority by the respondents in expenditure allocation, while farm activities and farm inputs were given low priority. While these results can explain the role of the family labour in carrying out various farm operations, they also show that farm inputs are less considered in expenditure allocation irrespective of farmers' complaints that inputs are expensive. According to Hella, (1995) in a study conducted in Njombe and Iringa Rural Districts, household expenses ranked first among family expenses while farm inputs and family labour ranked the lowest. From the results he concluded that the results explained the role of the family labour in carrying out farm operations, while at same time showing the little consideration placed on farm inputs in the household expenditure allocation priority.

Table 15: Distribution of respondents according to expenditure allocation pattern and expenditure allocation priority (N=92)

Expenditure allocation	Category one		Category two		Category three		Overall	
	n	%	n	%	n	%	n	%
Farm activities	10	10.9	18	19.6	30	32.6	58	63.1
Farm inputs	8	8.7	13	14.1	20	21.7	41	44.5
Health/ Education	39	42.4	18	19.6	11	12.0	68	74.0
Household expenses	22	23.9	29	31.5	13	14.1	64	69.5
No response	13	14.1	14	15.2	18	19.6	45	48.9
Total	92	100.0	92	100.0	92	100.0	-	-
<b>Expenditure priority</b>								
Farm activities	12	13	15	16.3	36	39.1	63	68.4
Farm inputs	11	12	15	16.3	13	14.1	39	42.4
Health/ Education	38	41.3	20	21.7	11	12	69	75.0
Household expenses	18	19.6	28	30.4	14	15.2	60	65.2
No response	13	14.1	14	15.2	18	19.6	45	48.9
Total	92	100	92	100	92	100	-	-

#### 4.1.7 Maize production and marketing.

This section presents production trends and marketing of maize before and after market liberalisation.

##### 4.1.7.1 Area under maize production

The total farm size per household ranged from 0.4 to 20 hectares and area under maize production ranged from 0.4 to 14 hectares. As shown in Table 16, most of the respondents (48.9% and 56.6%) indicated to own and grew maize in farms ranging from 1 to 3 hectares in size respectively. It is only 17.4% of the respondents who grew maize in areas larger than 3 hectares compared to 31.5% who own farms larger than 3 hectares. It suffices to note that households with small farms ranging from 3 hectares and below allocated most, if not all, of their land to maize production. This implies that

no land was spared for cash or other crops and hence, they depended solely on maize for both food and cash crop. According to Mbiha, (1993) and Hella, (1995) most of the households allocated most of their land to production of food crops (maize in particular) compared to cash or other crops. According to the National Sample Census Survey of Agriculture 1994/95 estimates (URT, 1996b), and the Expanded Survey of Agriculture for 1995/96 (MAC/NBS 1999), the size of the area cultivated per household in the rural areas of mainland Tanzania averaged 0.86 hectares and about 90% of all farmers cultivated less than 2.0 hectares. The reports further showed that about 62% of the surveyed farmers grew maize in plots less than 1.0 hectares in size.

Table 16: Distribution of respondents according to farm size and area under maize production (N=92)

Farm size (ha.)	Total farm size		Area under maize production	
	n	%	n	%
0.4 - 0.9	18	19.6	24	26.1
1 - 3	45	48.9	52	56.6
3.1 - 5	20	21.7	10	10.9
5.1 - 10	6	6.5	4	4.3
10.1 - 15	2	2.2	2	2.2
> 15.1	1	1.1	-	-
Total	92	100.0	92	100.0

#### 4.1.7.2 Maize production trend

Table 17 reveals that majority (83.7%) of the respondents indicated that maize production was decreasing over years. Only 9.8% reported that maize production is increasing. Most of the reasons given by the respondents in relation to their responses were associated with agricultural inputs. For example, lack of agricultural inputs due to high input prices (33.7%), failure to use adequate inputs (31.6%), lack of inputs due to unavailability (13%) and declining soil fertility (6.5%). On the other hand, farm

expansion, intensified use of manure and improved agricultural practices were among the major reasons given in support to increasing maize production. An informal discussion with small holder farmers and key informants revealed that maize production was decreasing because farmers have low purchasing power such that they fail to afford required inputs which are highly priced. Furthermore, the low prices offered for maize also discourage farmers from using agricultural inputs in maize production. The summary of the reasons given is presented in Table 17.

Table 17: Distribution of respondents according to maize production trend (N=92)

Yield trend	Reasons	Total			
		n	%*	n	%
Yield is increasing (n=9)	Farm expansion	5	5.4	9	9.8
	Intensified use of manure	3	3.3		
	Improved agricultural practices	3	3.3		
	Land is still fertile	1	1.1		
Yield is decreasing (n=77)	Lack of inputs due to high prices	31	33.7	77	83.7
	Failure to use adequate inputs	29	31.6		
	Lack of inputs due to unavailability	12	13		
	Declining soil fertility	6	6.5		
	Unfavourable weather	6	6.5		
	Poor agricultural practices	5	5.4		
	Lack of technical advice	2	2.2		
	Lack of labour force	1	1.1		
No change (n =2)	No improvement on agricultural practices	2	2.2	2	2.2
It fluctuates (n =4)	Depends on weather condition	4	4.3	4	4.3
Total				92	100

\* Percentages do not add to 100 as respondents have indicated more than one reason

#### 4.1.7.3 Marketing of maize

Table 18 shows the distribution of respondents according to the marketing channels used by smallholder farmers to sell their maize produce. According to the results most of the respondents (67.4%) sell their maize produce to private traders. Only 1.1% of the respondents sell to public institutions, while 31.5% of the respondents indicated that

they do not sell maize because their production levels are only sufficient to meet their domestic consumption.

From Table 18 it can also be noted that the criterion used by the smallholder farmers in the selection of the market channel were; the price being offered by the buyer (54.3%), and prompt payment for the produce sold (10.9%). Only 3.3% of the respondents indicated that they did not have any choice of channel to which they could sell their produce, instead, they sold to whatever market was available irrespective of the price being offered or time of payment for their produce.

Table 18: Distribution of respondents according to the channel used for marketing of maize (N=92)

Channel used for marketing of maize	n	%
Private traders	62	67.4
Public institutions	1	1.1
Do not sell	29	31.5
Total	92	100.0
Criterion used for the selection of marketing channel		
Price offered	50	54.3
Prompt payment	10	10.9
No choice	3	3.3
Transport costs from home to the market	1	1.1
No response	28	30.4
Total	92	100.0

#### 4.1.7.4 Comparison between maize marketing systems before and after reforms

Table 19 shows the distribution of respondents according to their perceptions on the maize marketing systems before and after reforms. The findings show that 55.2% of the respondents said that the present maize marketing system is poor when compared to the system before market reforms. Only 7.6% of the respondents said that the present marketing system is better than the system before reforms.

Several reasons were given in relation to the responses that were given. The main reason given by the respondents who said that marketing system after reform is poor was that private traders offer very low prices (27.2%). On the other hand, prompt payment for the produce sold (5.4%), was given as the main reason by the respondents who said that marketing system after reform is better. The summary of the reasons given by the respondents is presented in Table 19.

According to the Ministry of Agriculture and Cooperatives (MAC, 1997a) the implementation of macro economic reforms and structural adjustment programmes was expected to increase nominal producer prices as a result of competition among private traders. The main reason given by the respondents in favour of the system before reforms were low producer prices and dishonest of the private traders. This situation can be explained in two ways as follows.

Agricultural market reforms were intended to provide farmers with a wider market margin for their produce. As a result of competition among traders, as pointed out by the Ministry of Agriculture and Cooperatives, (1997a) farmers were expected to be in a better position to bargain with traders for better prices for their produce. However, the results show that was not the case. Farmers were so disorganised such that private traders took advantage of the situation and hence had an upper hand in price negotiations. In reality farmers were not bargaining for better prices but were selling according to the prices being offered by the private traders. As it has been pointed out by the Ministry of Agriculture and Co-operatives, for some crops such as coffee and tobacco the current marketing system has been efficient in disposing of the farmers produce. This is true for such crops because they attracted big private companies with large capital investment. But for food crops such as maize, the majority of the traders involved were small individual business men with limited capital investment and hence

their ability to penetrate deep into the rural areas was also very limited.

The second explanation is that in the past; farmers were used to sell their produce by weight and prices were set per unit weight. However, under the current system private traders buy maize by volume (bags). What is considered as an acceptable bag of maize to private traders is estimated to weigh in average between 125 and 135 kg. compared to a standard bag of 100 kg which farmers were used to before, while the prices for a bag remains the same. In this way farmers feel that they are being cheated. Farmers had views that lack of buying centers and tentative prices increase chances of being cheated because each farmer negotiate price with the buyer individually. According to Turuka, (1995), farmers selling maize to private traders or cooperative societies have been filling maize bags to the weights between 95 and 105 kg depending on the unit of measurement used (for example a bucket) and the age of the bag used. An average weight of 100 kg has been used in determining maize output price for those selling to the cooperative societies. However, prices received from private traders varied from one trader to another. Turuka, (1995) revealed further that the majority of farmers reported to have sold maize to private traders at prices lower than that provided by the cooperative societies. The Special Advisory Committee for Agricultural Development in Tanzania (URT, 1999b) noted that lack of buying posts and adherence to standard weights on food marketing after reforms has resulted into increased cheating and poor crop quality. Discussion with farmers in the study area revealed that farmers had to sell their maize produce to private traders because they had no any other reliable alternative market for their produce.

**Table 19: Distribution of respondents according to smallholder farmers' perceptions on maize marketing before and after reforms (N=92)**

Farmers perceptions	Reasons	Total			
		n	%*	n	%
Better (n=7)	Prompt payment for produce sold	5	5.4	7	7.6
	Better producer prices after reforms	2	2.2		
	Wider choice on when and where one can sell his/her maize	1	1.1		
No difference (n=2)	Cooperative unions were buying on credit, private buyers offer low prices	2	2.2	2	2.2
Poor (n=38)	Private buyers offer low prices	25	27.2	38	41.3
	No set prices	10	10.9		
	The market is not reliable	3	3.3		
Worse (n=4)	Private buyers cheat farmers by offering very low prices	4	4.3	4	4.3
Dont know (n=40)	I never sold maize in the past sytem	28	30.4	42	45.6
	I never sold maize in the present system	10	10.9		
	I never sold maize in either of the systems	4	4.3		
Total				92	100

\* Percentages do not add up to 100 as some respondents indicated more than one reason

## 4.2 Smallholder Farmers' Access to Agricultural Inputs

This section presents the sources of agricultural inputs available to smallholder farmers before and after inputs market liberalisation and sources of funds to purchase agricultural inputs.

### 4.2.1 Sources of agricultural inputs

Table 20 shows the distribution of respondents according to the sources of agricultural inputs before 1992. The year 1992 was used as a base because it is the year that the exercise of liberalising input markets was completed. (MAC, 1997b).

The results (Table 20) shows that 37%, 30.4% and 29.3% of the respondents obtained chemical fertilisers, improved maize seeds and pesticides from cooperative unions respectively. Only 1.1% of the respondents obtained the above mentioned agricultural inputs from Sasakawa Global 2000 project and TFA. With regard to the mode of

purchase of the inputs, 38%, 31.5% and 30.4% indicated to have obtained chemical fertiliser, improved maize seeds and pesticides on credit, while 1.1% used cash to obtain inputs.

It can also be noted from Table 20 that 60.9%, 67.4% and 68.5% of the respondents did not respond to any source for the inputs mentioned above. Through probing it was revealed that

- (i) Some of the smallholder farmers perceive that their farms are still rich in soil fertility therefore there is no need for them to incur costs on chemical fertilisers.
- (ii) Other smallholder farmers perceive that use of chemical fertilisers have negative effects on the soil. Once one starts to use chemical fertilisers he/she has to continue doing so. Failure to apply chemical fertiliser in the future will mean complete crop failure.
- (iii) Improved seeds are said to be less resistant to adverse weather and the crop can not be stored long without being treated with storage pesticides compared to local varieties.
- (iv) Farms located along river basins are claimed to have high percentages of clay which becomes dry and hard in case there is shortage of rainfall. If chemical fertiliser was applied it scorches the maize plants.

Table 20: Distribution of respondents according to sources of agricultural inputs before 1992 (N=92)

Source of inputs	Chemical Fertiliser		Improved seeds		Pesticides	
	n	% **	n	%	n	%
Cooperative union/society	34	37.0	28	30.4	27	29.3
RTC	2	2.2	-	-	-	-
Sasakawa Global 2000	1	1.1	1	1.1	1	1.1
TFA	-	-	1	1.1	1	1.1
No response	56	60.9	62	67.4	63	68.5
Total			92	100.0	92	100.0
<b>Mode of Purchase of inputs</b>						
Credit	35	38.0	29	31.5	28	30.4
Cash	1	1.1	1	1.1	1	1.1
No response	56	60.9	62	67.4	63	68.5
Total	92	100.0	92	100.0	92	100.0

\*\* The percentages do not add to 100 as some respondents indicated more than one source

#### 4.2.2 Private inputs trader's operations.

Table 21 summarises the responses on the performance of private inputs trader's operations in the respondents villages. The majority of the respondents (70.6%) indicated that there were no input traders operating in their villages. Instead, they have to travel to the nearby towns or District headquarters where inputs are sold.

With regard to the types of inputs supplied regularly, 19.6% of the respondents indicated chemical fertiliser and pesticides. Other details are provided in Table 21. During the survey it was observed that an inputs shop was found in one village out of the four villages studied. An informal discussion with the shopkeeper revealed that improved maize seeds were not regularly sold at the shop because farmers who needed improved maize seeds bought them from a nearby seed farm.

Table 21: Distribution of respondents according to the performance of private input traders' operations in their village (N=92)

<b>Are there private input traders operating in the village</b>	<b>n</b>	<b>%</b>
Yes	27	29.3
No	65	70.6
Total	92	100.0
<b>Types of inputs supplied regularly by the traders</b>		
Chemical fertilizer only	2	2.2
Chemical fertilizer and pesticides	18	19.6
Chemical fertilizer, seeds and pesticide	1	1.1
No response	71	77.2
Total	92	100.0

#### 4.2.3 Main sources of funds to purchase agricultural inputs

Main sources of funds for purchasing farm inputs are presented in Table 22. From Table 22, it can be noted that sales of food crops (37%) and sales of cash crops (34.8%) were the main sources of funds for purchasing farm inputs. Only 2.2 percent of the respondents relied on assistance from relatives. 47.8% of the respondents did not respond. This implies that they do not purchase agricultural inputs, instead, some of the respondents use locally available materials such as farmyard manure and seeds selected from previous harvests.

According to Harvard Institute for International Development (HIID), (1994) and Heisey and Smale, (1994), low purchasing power in the smallholder production caused a dramatic reduction in fertiliser use between 1992/93 and 1993/94 seasons in Malawi. They concluded that, crop prices received by household play an important role in determining the use of inputs particularly in the cases where households have no alternative to inputs purchase.

Table 22: Distribution of respondents according to the main sources of funds for the purchase agricultural input (N=92)

Source of funds to the smallholder farmers	n	%
Sales of cash crops	32	34.8
Sales of food crops	34	37.0
Non farm activities	11	12.0
Assistance from relatives	2	2.2
No response	44	47.8
Total	92	100.0

### 4.3 Utilisation of Agricultural Inputs in Maize Farms

This section presents the results on the utilisation of different types of agricultural inputs and factors affecting utilisation of agricultural inputs by smallholder farmers.

#### 4.3.1 The Most important agricultural input to the smallholder farmers

According to Table 23, the most important agricultural inputs to the smallholder farmers were chemical fertilizer (45.7% ), followed by pesticides (35.9%), and farm yard manure (28.8%). Improved maize seed was least (14.1%)

According to Dapaah and Ontikorang, (1990) and Tanzania Agricultural and Rural Credit Project (1991) the role of fertiliser in improving crop yields and hence agricultural production is generally the highest followed by improved farming practices, improved seeds and pest control. The Special Advisory Committee on Agricultural Development in Tanzania (URT, 1999b), revealed that, production and utilisation of improved seeds in Tanzania is very low. The low use of improved seeds is responsible for the low agricultural production and productivity.

From the results it can also be noted that organic fertilisers (manure in particular) is increasingly becoming an important input to smallholder farmers for field crops. This is probably due to the need to improve soil fertility and the ever increasing prices of commercial chemical fertilisers.

Table 23: Distribution of respondents according to the most important agricultural inputs to the smallholder farmers (N=92)

Type of input	n	%*
Chemical fertilizers	42	45.7
Pesticides	33	35.9
Improved Maize Seeds	13	14.1
Farmyard manure	21	22.8
Both	2	2.2
None	26	28.3

\* Percentages do not add up to 100 as respondents indicated more than one response

In order to see whether the choice of the farmers was influenced by the household income a Chi-square test was conducted. The results of the test (Table 24) show that there was a significant relationship between the farmers choice for agricultural inputs and the household income ( $p=0.00019$ ). This implies that farmers choice of agricultural input is influenced by the household income. The results show that most of the farmers who did not use any kind of inputs (51.4 %) and those who used farmyard manure (29.7 %) were in the lowest income bracket. Other details are presented in Table 24.

According to Sechambo, *et al*, (1995), 31.5 percent of smallholder farmers surveyed in Lushoto and Iringa Districts in Tanzania use organic fertilisers (mostly manure) for maize production. Chantalakhan, (1990), reported that in Thailand where rice yields in rainfed areas has averaged 1.5 to 2.0 mt/ha. without the use of chemical fertiliser,

animal manure has been the only major source of fertiliser to which farmers have access to and which they can afford.

An informal discussion with input suppliers at Ilula in Iringa District revealed that most of the chemical fertiliser purchased by smallholder farmers around Ilula is used for tomato production instead of maize. Tomato is grown at Ilula and nearby villages for commercial purposes.

**Table 24: Relationship between input use and household income (N=92)**

Type of input	Average household annual income ('000' Tshs)											Total	
	< 100		100 - 199		200 -299		300 - 499		> 499				
	n	%	n	%	n	%	n	%	n	%	n	%	
Chemical fertilizer	5	13.5	2	8.3	1	10	1	5.9	-	-	9	9.8	
Pesticides	-	-	-	-	-	-	-	-	1	25	1	1.1	
Fertiliser., seeds	-	-	-	-	-	-	1	5.9	-	-	1	1.1	
Fertiliser, pesticides.	2	5.4	5	20.8	6	60	8	47.1	1	25	22	23.9	
Seed , pesticides	-	-	2	8.3	-	-	1	5.9	-	-	3	3.3	
All	-	-	3	12.5	1	10	2	11.8	1	25	7	7.6	
FYM	11	29.7	5	20.8	1	10	2	11.8	-	-	19	20.6	
Seed,pesticides.,Fym	-	-	1	4.2	-	-	1	5.9	-	-	2	2.2	
Pesticides., FYM	-	-	1	4.2	-	-	1	5.9	-	-	2	2.2	
None	19	51.4	5	20.8	1	10	-	-	1	25	26	28.3	
Total	37	100	24	100	10	100	17	100	4	100	92	100	

Chi-square =74.02916    Significance = 0.00019    Df =36    Significance level = 0.01

#### **4.3.2 Chemical fertiliser most commonly used by farmers**

There are two main types of chemical fertilisers; basal fertilisers and top dressing fertilisers. Table 25 presents a summary of the type of chemical fertiliser most commonly used by farmers in maize production. According to the results, the commonly used chemical fertiliser was top dressing fertiliser (43.5%). None of the respondents used basal fertilisers. On the other hand, 56.5% of the respondents did not respond implying that they neither used top dressing fertiliser nor basal fertiliser. Other reasons

given by the farmers are presented in Table 25.

A discussion with farmers at Kitowo village revealed that basal fertilisers are used by farmers in production of garden peas and beans which fetch higher prices in the market than maize.

According to FAO (2000); application of nitrogen rich chemical fertiliser alone deplete the soil of other important plant nutrients such as phosphorous and potassium. Research findings show that without phosphorous and potassium application, nitrogen efficiency decline, whereas when all nutrients are applied together, phosphorous and potassium efficiency increase. Thus application of chemical fertiliser in favour of nitrogen rich fertilisers is a waste of labour, capital, environmentally detrimental and not sustainable (FAO, 2000). Hawassi (1997) reported that increase in prices of chemical fertilisers as a result of subsidy removal on chemical fertilisers, accompanied by low producer prices for maize have led more farmers into using low analysis fertilisers.

Table 25: Distribution of respondents according to the type of chemical fertiliser commonly used by smallholder farmers (N=92).

Type of chemical fertiliser	n	%
Basal fertilisers	0	0.0
Top dressing fertilisers	40	43.5
None	52	56.5
Total	92	100.0
<b>Reasons for not using basal fertiliser</b>		
Basal fertilizers are too expensive	38	41.3
<b>Reasons for not using either of the chemical fertilisers</b>		
Chemical fertilisers are too expensive	45	48.9
Farmyard manure is used instead of chemical fertiliser	6	6.5
Land is still fertile	3	3.3
Total	92	100.0

**(i) Chemical fertiliser**

From the results (Table 26), it can be noted that only 28.3% of the respondents were using basal fertiliser at the recommended rate of 50 kg/acre before market liberalisation. The results of a Chi square test for relationship between basal fertiliser use and household income was significant ( $p=0.00009$ ). According to the results (Table 26), majority (97.3%) of the respondents who were not using basal fertiliser before market reforms are in the lowest income bracket.

Table 26: Relationship between application rates for basal fertiliser and annual household income (N=92)

[illegible]

### **(b) Top dressing fertiliser**

The results of a Chi square test for relationship between household income and top dressing fertiliser as applied by the respondents before and after market reforms were found significant ( $p=0.00000$  and  $p=0.0001$ ). From Table 27 it can be observed that majority (86.5% and 83.5%) of the respondents in the lowest income bracket did not use top dressing fertilisers before and after market reforms.

The following section describe the two main types of top dressing fertiliser used by the smallholder farmers, that is Urea and CAN.

#### **(i) Urea**

The results (Table 27) show that only 6.5% and 1.1% of the respondents were using Urea at the recommended rate of 100 kg/acre before and after market reforms respectively. Generally the results show that respondents who were using Urea at recommended rate are in the middle to upper income brackets.

#### **(ii) CAN**

From Table 27 it can also be noted that neither of the respondents were using CAN at the recommended rate of 200 kg/acre before and after market reforms. The results further show that respondents who were using CAN although not at recommended rate are in the middle to upper income brackets.

Although Urea is slightly more expensive than CAN, it contains about two times the amount of Nitrogen contained in CAN (Urea contains 46% N per unit compared to 26% contained in CAN). It was therefore expected that farmers will tend to prefer use of Urea instead of CAN because of its advantage of having higher percentage of nitrogen. However, observations made in the field show that more farmers use CAN instead of

Urea in areas where rainfall is less reliable or where there is shortage of rainfall.

According to FAO, (2000), although Urea is the world's major source of nitrogen, due to its high concentration and its unusually attractive price per unit of N, its application requires exceptionally good agricultural practices to avoid evaporation losses of ammonia in the air. Urea should be applied only when it is possible to either incorporate it into the soil immediately after spreading or when rain is expected within the few hours following the application. On the other hand, CAN with up to 27% of N is a fertiliser of preference on crops in the semi-arid regions of the sub-tropics.

According to MAC, (1997b) and MDB, (1997) fertiliser consumption in the southern highlands has declined from 70% of the countrys' total consumption in early 1990s to 37% in 1996/97 season. The National Sample Census of Agriculture results for the 1993/94 and 1994/95 seasons (URT, 1996a and 1996b), showed that there was a marked decrease in the proportion of farming households applying chemical fertilisers nationwide. The trend of declining use of agricultural inputs were also reported by Booth (1991), Kashuliza and Mbiha (1995), Msambichaka and Naho, (1995) and Ponte, (2000).

Table 27: Relationship between top dressing fertiliser application rates before and after market reforms and household annual income (N=92)

		Average household annual income ('000' Tsh.)											
		< 100		100 - 199		200 - 299		300 - 499		> 499		Total	
Rate Before reforms (kg/acre)		n	%	n	%	n	%	n	%	n	%	n	%
Nil		32	86.5	12	50	2	20	2	11.8	1	25	49	53.3
50 (Urea)		1	2.7	5	20.8	4	40	10	58.8	-	-	20	21.7
100 (Urea)		-	-	-	-	1	10	4	23.5	1	25	6	6.5
50 (CAN)		4	10.8	3	12.5	-	-	1	5.9	-	-	8	8.7
65 (CAN)		-	-	-	-	-	-	-	-	1	25	1	1.1
100 (CAN)		-	-	4	16.7	1	10	-	-	1	25	6	6.5
150 (CAN)		-	-	-	-	2	20	-	-	-	-	2	2.2
Total		37	100	24	100	10	100	17	100	4	100	92	100
Rate after reforms													
(kg/acre)													
Nil		31	83.8	14	58.3	2	20	4	23.5	2	50	53	57.6
< 50 (Urea)		-	-	2	8.3	-	-	1	5.9	-	-	3	3.3
50 (Urea)		-	-	2	8.3	4	40	9	52.9	-	-	15	16.3
100 (Urea)		-	-	-	-	-	-	1	5.9	-	-	1	1.1
< 50 (CAN)		1	2.7	-	-	-	-	-	-	-	-	1	1.1
50 (CAN)		5	13.5	2	8.3	1	10	-	-	-	-	8	8.7
65 (CAN)		-	-	2	8.3	-	-	-	-	1	25	3	3.3
100 (CAN)		-	-	2	8.3	1	10	2	11.8	1	25	6	6.5
150 (CAN)		-	-	-	-	2	20	-	-	-	-	2	2.2
Total		37	100	24	100	10	100	17	100	4	100	92	100

\* Chi-Square = 81.37152    Significance = 0.00000    Df = 24    Significance level = 0.01

\*\* Chi-Square = 79.74234    Significance = 0.00001    Df = 32    Significance level = 0.01

## (ii) Improved maize seeds

Table 28 summarises the responses on the use of maize seed before and after market liberalisation.

The results of a Chi square test for relationship between household income and the rates of improved maize seeds applied by the respondents before and after seed market reforms were significant ( $p=0.00001$  and  $p=0.01884$ ). The results show that

majority (94.6% and 100%) of the respondents who were not using improved maize seeds before and after market reforms were in the lowest income bracket. Overall, the results (Table 28) show that the percentage of smallholder farmers using improved maize seeds at the recommended rate of 10 kg/acre have declined from 32.6% before market liberalisation to 16.3% after liberalisation.

According to Iringa District reports (IDC, 1997), majority of smallholder farmers in the District use maize seeds selected from the previous harvests instead of purchasing new seeds due to high prices of commercial improved seeds. Young, (1995), estimated that 90 percent of Tanzanias' farmers use traditional or non-specific varieties of seeds derived from traditional methods of agriculture in which a farmer uses a portion of his/her crop for seeds for the next years crop. According to Young (1995), by selecting the best plants within the crop and trading with his/her neighbour, a farmer can over many generations, improve and stabilize the variety. However, with hybrid seeds this process is not possible, therefore, a farmer has to purchase new hybrid seeds every season (Young, 1995).

Table 28: Relationship between maize seed rate and household annual income  
(N=92)

Rate	Average household annual income ('000 Tsh)											
before	< 100		100 - 199		200 - 299		300 - 499		> 499		Total	
reforms												
(kg/acre)	n	%	n	%	n	%	n	%	n	%	n	%
Nil	35	94.6	16	66.7	5	50	4	23.5	2	50	62	67.4
10	2	8.1	8	33.3	5	50	13	76.5	2	50	30	32.6
Total	37	100	24	100	10	100	17	100	4	100	92	100

Rate after												
reforms												
(kg/acre)												
Nil	37	100	16	66.7	9	90	11	64.7	3	75	76	82.6
2	-	-	1	4.2	-	-	-	-	-	-	1	1.1
10	-	-	7	29.2	1	10	6	35.3	1	25	15	16.3
Total	37	100	24	100	10	100	17	100	4	100	92	100

Chi-Square	29.27517	Significance = 0.00001	Df. = 4	Significance level	0.01
*Chi-Square	18.33726	Significance = 0.01884	Df = 8	Significance level	0.05

### iii) Pesticides

The results of a Chi square test for relationship between household income and pesticide utilisation by smallholder farmers was statistically significant ( $p=0.00004$ ), implying that pesticide application is influenced by the farmers income.

From Table 29 it can be noted that majority (94.6%) of non users of pesticides are in the lowest income bracket. Generally, the results show that most of the smallholder farmers (57.6%) did not apply pesticides in their maize fields.

Table 29: Relationship between pesticide application and household annual income  
(N=92)

Average household annual income ('000' Tsh.)														
Do you use pesticides in your maize fields			< 100		100 - 199		200 - 299		300 - 499		> 499		Total	
			n	%	n	%	n	%	n	%	n	%	n	%
Yes always			2	5.4	12	50.0	7	70	13	76.5	3	75	37	40.2
Yes sometimes			-	-	2	8.2	-	-	-	-	-	-	2	2.2
No			35	94.6	10	41.7	3	30	4	23.5	1	25	53	57.6
Total			37	100	24	100	10	100	17	100	4	100	92	100
Chi-Square = 41.68472      Significance = 0.00004      Df = 12      Significance level = 0.01														

#### 4.3.4 Factors affecting the use of agricultural inputs

Table 30 presents a summary of the factors which influence the use of agricultural inputs by smallholder farmers.

##### (i) Factors affecting use of chemical fertiliser

Table 30, reveals that the major factors influencing use of chemical fertilisers by smallholder farmers were: (i) financial constraints (low purchasing power) (76.1%), (ii) unfavourable weather condition (12%), (iii) Unavailability of fertilisers (6.5%) and (iv) poor soil fertility (6.5%). From Table 30 it is clear that high prices of chemical fertilisers is the most important factor limiting the use of chemical fertilisers.

According to Turuka (1995), one reason for smallholder farmers failure to use chemical fertiliser or to use relatively low amounts of chemical fertilisers in Moshi District was lack of sufficient funds to purchase chemical fertilisers. On the contrary, Turuka also reported that in case of Songea District the problem was not that of insufficient funds but availability of chemical fertilisers.

Despite the fact that households in this study did not consider unavailability of chemical

fertiliser as an important determinant of fertiliser use, other studies (Blackie, 1990; Fontaine and Sindzingre, 1991; and Pinstup, 1993). on chemical fertiliser use have shown that problems of availability of chemical fertiliser to farmers are as important as price response interactions in determining chemical fertiliser use.

### **(ii) Factors affecting use of improved maize seeds**

Table 30 shows that financial constraints (low purchasing power) (84.8%) was one of the major factors affecting use of improved maize seeds. Other factors identified by the smallholder farmers are summarised in Table 30.

### **(iii) Factors affecting use of pesticides**

According to Table 30, the major factor affecting use of pesticides by smallholder farmers is financial constraint (low purchasing power) (77.2%). The summary of other factors identified by the smallholder farmers is presented in Table 30.

According to the Special Advisory Committee on Agricultural Development in Tanzania (URT, 1999b), low purchasing power, lack of credit facilities, poor rural road infrastructure and high costs of fuel are among the major causes of low consumption of inputs in Tanzania. The Economic and Social Research Foundation (ESRF), (1999), noted that cultural and management systems for the majority of farmers are still traditional and consistent with a subsistence economy. For example, even where new varieties of seeds are planted they are not accompanied by optimal input usage (such as chemical fertiliser, and pesticides). The removal of farm input subsidies have worsened the state of input usage. Besides the above causes, MAC, (1997b); MDB, (1997) and MAC/NBS, (1998) contend that high input prices, lower producer prices and the collapse of cooperative unions which used to provide credits to farmers were also

responsible for low consumption of agricultural inputs.

Table 30: Distribution of respondents according to factors affecting the use of agricultural inputs (N=92)

Type of input	Fertilizer		Improved Seeds		Pesticides	
Factors	n	%**	n	%**	n	%**
Financial constraints (low purchasing power)	70	76.1	78	84.8	71	77.2
Unfavourable weather	11	12	5	5.4	5	5.4
Inputs are not readily available	6	6.5	3	3.3	3	3.3
Farms are low in soil fertility	6	6.5	-	-	-	-
Low producer prices	2	2.2	3	3.3	2	2.2
Fear of negative side effects to the soil	4	4.3	-	-	-	-
Need to increase productivity	1	1.1	6	6.5	2	2.2
To increase production	1	1.1	6	6.5	2	2.2
Farms are still fertile	2	2.2	-	-	-	-
Lack of knowledge	-	-	1	1.1	-	-
High Susceptibility to disease and insect attack	-	-	1	1.1	-	-
High rates of insect infestation	-	-	-	-	13	14.1

\*\* Percentages do not add to 100 as respondents indicated more than one factor

#### 4.4 Main Constraints Facing Smallholder Farmers in Obtaining Agricultural Inputs

Table 31 reveals that the major constraints facing smallholder farmers in obtaining agricultural inputs were financial constraints (92.4%) and unavailability of inputs (21.7%). Table 31 presents major constraints faced by farmers.

According to the Agriculture and Livestock Policy of 1997 (MAC, 1997a) and ESRF (1999), one of the effects of market liberalisation in the agriculture sector is the removal of credit inputs and subsidies on agricultural inputs which has led into an increase in the prices of agricultural inputs. The results of the Expanded Agriculture Survey for 1996/97 season (MAC/NBS 1999), showed that the majority (87%) of the surveyed holdings did not use chemical fertiliser in 1996/97 mainly due to low purchasing power, unavailability

of chemical fertilisers, lack of knowledge on the benefits of using fertiliser and fear of negative effects of chemical fertiliser on soil fertility.

Table 31: Distribution of respondents according to constraints facing farmers in obtaining agricultural inputs (N=92).

Constraint	n	%*
Financial constraint	85	92.4
Unavailability of inputs	20	21.7
Low producer prices for maize	8	8.7
Lack of extension advice	1	1.1
No constraint	2	2.2

\* Percentages do not add up to 100 as some respondents indicated more than one constraint.

#### 4.5 Access to Credits for Agricultural Inputs

Table 32 summarises the respondents responses on access to credits for agricultural inputs. The results show that 100% of the respondents had no access to any type of credit for agricultural inputs. This implies that for the farmers inputs requirements they have to purchase them on cash from their own sources.

According to Lyatuu, (1994) credit facilities assist farmers in the adoption of agricultural technologies by increasing farmer's capability to purchase inputs such as fertiliser and seeds that would otherwise not be affordable to them. Ponte, (2000) argues that the increasing shortage of credit for input purchase to farmers aggravates farmer's difficulties in getting access to agricultural inputs. According to ESRF, (1999), reforms taking place in the cooperative unions, banks and other financial institutions had caused considerable decline in credit flow through cooperatives and other financial institutions to the rural areas. This means that increasingly more people no longer get access to formal financial services and instead, have to rely on informal and semi

formal financial arrangements to access production credit, or have to accumulate savings. Lack of information on available funding sources and the procedure to obtain such credits, and the lack of intensive investment plans are other factors cited as limiting farmers access to credits (ESFR, 1999).

**Table 32: Distribution of respondents according to access to credits for agricultural inputs (N=92)**

Do you have an access to credits for inputs	n	%
Yes	0	0
No	92	100

#### **4.6 Farmers' Opinions on the Performance of the Inputs Marketing System After Reforms**

Table 33 shows that while 19.6% of the respondents were of the opinion that the performance of the inputs marketing system after reforms is better than the system before reforms, 41.3% were of the opinion that overall, the performance of the marketing system after reforms is poor.

A Chi-Square test was conducted to test whether the farmers opinions were influenced by the location of their villages from the District headquarters where most of the inputs suppliers are located. The results as summarised in Table 33 show that there was a significant relationship between the farmers' opinions on the performance of the inputs marketing system after reforms and the location of the farmers ( $p=0.00000$ ).

From the results it can be noted that while 52.9%, 27.2%, and 7.6% of the respondents from Muwimbi, Isakalilo and Vitono villages indicated that the performance of inputs marketing system after reforms is better than before the reforms, only 3.7% were of the same opinion from Kitowo. On the otherhand the majority (96.3%) of the respondents from Kitowo were of the opinion that the performance of the inputs marketing system after reforms is poor than before the reforms. The results reflects the distances to be travelled from their villages to sources of inputs. While Isakalilo is only 8 km. from town centre, Muwimbi and Vitono are located close to the Dar Es Salaam - Tunduma highway where transportation is easy, Kitowo is located 60 km away in an area where transportation is difficult.

According to Turuka, (1995) and URT, (1999b) poor road infrastructure was the major factor contributing to unavailability of inputs to farmers in Songea District and other rural areas.

**Table 33: Relationship between farmers opinions on the current inputs marketing system and location. (N=92)**

Opinion	Village									
	Isakalilo		Vitono		Muwimbi		Kitowo		Total	
	n	%	n	%	n	%	n	%	n	%
Reliable	6	27.2	2	7.6	9	52.9	1	1.1	18	19.6
Not reliable	3	13.6	3	11.5	6	35.2	26	96.3	38	41.3
Don't know	13	59.1	21	80.8	2	11.8	-	-	36	39.1
Total	22	100	26	100	17	100	27	100	92	100
Chi-Square = 39.67645    Significance = 0.00000    Df = 20    Significance level = 0.01										

The smallholder farmers were also required to give reasons in relation to their responses on the performance of the inputs marketing system after reforms. According to Table 34, 12% and of the respondents showed that input marketing after reforms is

better because of the emergence of more input suppliers. On the otherhand, the major reasons given by the respondents who said that marketing performance is poor than before the reforms were: (i) Input prices are too high and unstable (9.8%) (ii) quantities and types of inputs supplied at a time were inadequate (7.6%), and (iii) supply of inputs is mostly confined to the urban areas (7.6%). Other reasons given by the respondents are presented in Table 34. The no response category (39.1%) comprised of respondents who had never bought inputs before or after market reforms for various reasons such as lack of money to purchase inputs, fear of side effects if they use inputs such as chemical fertilisers, fear of being expelled by the land owners in case of rented farms, while other respondents use locally available materials such as farmyard manure.

A discussion with input suppliers at Iringa revealed that inadequate capital, lack of transport, high transportation costs and inadequate supply of inputs from importers were among the main constraints hindering input suppliers and traders from distributing inputs to the remote rural areas. In addition low producer prices for maize, high input prices and lack of credit, together, discourage farmers from using agricultural inputs in maize production.

According to Ponte, (2000), liberalisation of agricultural input markets has improved efficiency and timing of the distribution of inputs but only in the urban areas and in areas with good transport infrastructure. Private input traders have not shown interest in operating in remote areas.

Table 34: Reasons given by respondents in relation to the performance of the inputs marketing system after reforms (N=92).

Opinion	Reasons	n	%**
Reliable (n=18)	The number of input suppliers/traders have increased	11	12
	Inputs are readily available	7	7.6
Not reliable (n=33)	Quantities of inputs supplied at a time are inadequate	7	7.6
	Input prices are too high and unstable	9	9.8
	Supply of inputs is mostly confined in urban areas	7	7.6
	Few types of inputs are supplied at a time	6	6.5
	Stockists decide when and what type of inputs to supply	5	5.4
	Inputs sold are of low quality	4	4.3
I dont know (n=36)	I had never bought inputs	35	38
	I never bought inputs after reforms	1	1.1

\*\* Percentages do not add to 100 as some respondents indicated more than one reason.

#### 4.7 Extension Workers' Opinions on the Agricultural Inputs Marketing Reforms.

Extension workers were requested to present their opinions pertaining to the effectiveness of the agricultural inputs marketing system after reforms in relation to their role as providers of extension services to farmers. This section presents the extension workers opinions in relation to accessibility of agricultural inputs to farmers before and after reforms and the future state of the inputs marketing system.

##### 4.7.1 Extension workers' opinion on accessibility of agricultural inputs to smallholder farmers.

Table 35 summarises the extension workers opinions on the accessibility of agricultural inputs to farmers under the liberalised market. According to the results, 45.5 percent of the extension were of the opinion that inputs are not available to farmers on time while

45.5 percent were of the opinion that inputs are accessible to farmers on time but are too expensive for the farmers. Two major problems regarding use of inputs revolve around timely availability and price.

Table 35: Extension workers opinions on the accessibility of agricultural inputs to smallholder farmers (N=11)

Opinions	n	%**
Inputs are not available to farmers	5	45.5
Inputs are not available to farmers on time	5	45.5
Inputs are available but too expensive	5	45.5
Inputs are readily available to farmers but not on time	1	9.1

\*\* Percentages did not add up to 100 as some respondents indicated more than one reason

The extension workers were also asked to compare the two systems that is input marketing system before reforms and the system after reforms and give their opinions on the system which is more effective. The summary of the results is presented in Table 36. From Table 36, it can be observed that majority of the extension workers (81.8 percent) were of the opinion that the system before reforms was more effective compared to the system after reforms.

The major reasons given by the extension workers in support to their opinions were as follows (i) before market reforms the quality of inputs which were supplied to farmers was controlled hence farmers were assured of good quality inputs (36.4%), (ii) input prices were reasonable and affordable (27.3%), and (iii) farmers were certain of being supplied with inputs (27.3%). Other reasons given by the extension workers are presented in Table 36.

**Table 36: Extension workers opinions on the system which is more effective between the system before reforms and the system after the reforms (N=11)**

Which inputs marketing system is more effective	n	%
The marketing system before reforms	9	81.8
The marketing system after reforms	2	18.2
Total	11	100
<b>Reasons given by the extension workers in relation to their opinions</b>		<b>**</b>
Before reforms the quality of inputs supplied was well controlled	4	36.4
Before reforms prices for agricultural inputs were reasonable and affordable	3	27.3
Before reforms farmers were certain of being supplied with inputs	3	27.3
Before reforms inputs were accessible to farmers on credit	1	9.1
Before reforms inputs were distributed close to farmers	1	9.1
The system before reforms was well coordinated and controlled	1	9.1

\*\*Percentages do not add up to 100 as some of the respondents gave more than one reason.

#### **4.7.2 The opinions of extension workers on the current and the future state of agricultural inputs marketing**

Table 37 summarises the extension workers opinions on the current and the future state of inputs marketing. According to Table 37, 63.6% of the respondents were of the opinion that the current inputs marketing system is poorly organised while 36.4% were of the opinion that supply of inputs is confined to urban areas. Only 9.1% were of the opinion that the current system is satisfactory compared to the marketing system before reforms.

With regard to the future inputs marketing, 36.4% of the extension workers were of the opinion that the market situation will be worse unless input importation is placed under

the government control or regulatory mechanisms are established. The summary of the extension workers opinions is presented in Table 37.

An interview with input suppliers and traders revealed that even the suppliers and traders were not comfortable with the way input marketing is organised. Most of them complained about high input prices , high costs of transportation, taxes and lack of access to credit to boost up their capital. Interest rates charged by banks are too high and conditions set by other lending institutions such as the National Inputs Trust Fund are too demanding especially to small scale suppliers. Some of the suppliers were not even aware of the fund and/or procedures to follow to secure credit from the fund. The suppliers were of the opinion that the future market for inputs will be worse unless the government deliberately intervene and improve the current situation.

Table 37: Extension workers opinions on the current and the future state of inputs marketing (N=11)

Extension workers opinions	n	%
<b>Opinions on the current state of inputs marketing</b>		
The current system is poorly organised	7	63.6
Supply of inputs is confined in urban	4	36.4
Subsidy or credit scheme is necessary to assist farmers	2	18.2
Inputs suppliers/traders lack professional training	1	9.1
Frequent inputs price fluctuation disappoint farmers	1	9.1
There is delay in inputs distribution	1	9.1
The current system is satisfactory compared to the past one	1	9.1
<b>Opinions on the future state of inputs market</b>		
Future market will be worse unless government controls inputs importation	4	36.4
Proper handling of inputs must be emphasised to maintain good quality	1	9.1
The government should establish a more effective quality control system.	1	9.1
Credit schemes for farmers are necessary in the future	1	9.1
Input suppliers/traders and sales personnel should be professionally well trained	1	9.1

#### 4.8 The Effects of Inputs Marketing Reforms on Extension Services

The extension workers were also required to indicate effects which had affected their work as a result of the inputs market liberalisation. In this aspect they were required to give both positive and negative effects. From Table 38, it can be noted that, while 9.1% of the extension workers have shown that farmers have increased demand for extension services as a result of market reforms, 45.5% of the extension workers showed that the reforms had no any positive effect to extension services.

With regard to negative effects to extension services, the major negative effects given by the extension workers were; (i) some of the inputs distributed by private suppliers are of low quality (36.4%), (ii) inputs are not easily accessible to farmers (36.4%) and (iii) inputs prices are too high for the smallholder farmers to afford (36.4%). Other reasons are presented in Table 38. According to the extension workers these effects contribute in making delivery of services to farmers and adoption of innovation by farmers difficult.

According to Osburn and Schneeberger, (1983), extension services and agricultural inputs are two factors which complement each other in such a way that agricultural inputs can not be effected without extension services which is a complementary service to agricultural inputs. FAO, (1995) noted that shortage of money, inaccessibility to land and farm inputs, together, impede employment of new and improved technologies in rural farms, thus inducing many of the smallholder farmers to retreat into more traditional patterns of subsistence production. According to the Ministry of Agriculture and Cooperatives, (MAC,1997b) lack of control and monitoring in the use of agrochemicals at secondary level distribution and presence of sub-standard and adulterated products in the market are among problems which had been observed in the private sector participation in marketing of agrochemicals.

Table 38: Respondents opinion on the effect of inputs market reform on extension Services(N=11).1).

Opinions	n	%
<b>Positive effects of market reforms on extension services</b>		
No positive effect	5	45.5
Inputs are more available than before the reforms	4	36.4
Market competition can reduce input prices	1	9.1
Demand for extension services has increased after reforms	1	9.1
Total	11	100
<b>Negative effects of market reforms on extension services</b>		
Some inputs supplied are of poor quality (sub-standard/ adulterated)	4	36.4
Input prices are too high for the farmers to afford	4	36.4
Inputs are not easily accessible to farmers	4	36.4
Extension workers have no control on inputs supplied	3	27.3

\*\*Percentages do not add up to 100 as some of the respondents gave more than one reason.

In summary, chapter four has tried to look into the effects of inputs marketing reforms on inputs use in maize production by smallholder farmers. It has identified the main sources of agricultural inputs, accessibility of inputs to smallholder farmers as well as farmers' requirements for agricultural inputs. The chapter also looked into the utilisation of agricultural inputs by small holder farmers and factors affecting accessibility and utilisation of agricultural inputs. In addition, the chapter examined the farmers' attitudes towards liberalised inputs marketing system and constraints to delivery of extension services.

In short, it was found out that after the reforms farmers obtained agricultural inputs from private input suppliers and traders on cash terms. It appears that although market reforms have, in a way, improved the distribution of inputs to the district level by

increasing the number of input suppliers, the study revealed that the inputs were not easily accessible to farmers for various reasons as indicated in the text. In addition, the chapter reveals that while top dressing fertilisers were found to be the most required input by the farmers, the percentage of farmers using agricultural inputs whether at recommended rates or not has declined drastically after the reforms. The mostly affected inputs were basal fertilisers. It was also found out that both farmers and extension workers perceived that input marketing after reforms is unreliable and poorly organised thus constraining delivery of extension services and adoption of innovation by farmers.

Chapter five presents the conclusions and recommendations drawn from the study.

## CHAPTER FIVE

### CONCLUSION AND RECOMMENDATIONS

The overall aim of this study was to determine the effects of liberalisation of agricultural inputs marketing system on inputs use in smallholder maize production in Iringa rural district. This chapter summarises the conclusions and recommendations derived from the study. The conclusions are organised around the study objectives as laid down in the first chapter which is also in line with the way the results were presented.

#### 5.1 CONCLUSION

Basing on the study findings, the following conclusions are provided

1. The study identified that the main sources of agricultural inputs to the smallholder farmers after the market reforms were private input suppliers and traders stationed in the urban areas of the District where farmers obtain inputs on cash terms.
2. The study findings show that agricultural inputs marketing reforms improved distribution of inputs at least to the district level, but these inputs were not accessible to the smallholder farmers due to the following reasons
  - (i) Inputs were stocked in the urban areas.
  - (ii) Farmers have low purchasing power such that they fail to afford inputs which are highly priced.
  - (iii) Lack of credits for inputs on the part of farmers.
3. Despite the fact that the main source of income to the farmers was sale of crops, the study revealed that purchasing of agricultural inputs as a household

expense was given a very low priority in terms of allocation of funds from the household income. The low priority given to agricultural inputs was based on the fact that expenses such as food, clothing, and health services are basic day to day necessities, while agricultural inputs are seasonal expenses which a household can do without.

4. The study revealed that farmers had abandoned use of basal fertilisers in favour of top dressing fertilisers because they were too expensive.
5. In addition, it was found out that the proportion of smallholder farmers using agricultural inputs whether at recommended rates or not declined drastically after the reforms mainly due to high input prices, lack of credits and unavailability of inputs in the rural areas. The study also revealed that if the number of farmers using inputs will continue declining, it will not only be detrimental to production of maize and other crops, but also to the environment as farmers will look for other alternatives such as opening up of virgin land.
6. The major constraints which hindered farmers from obtaining agricultural inputs were low purchasing power and unavailability of inputs in the rural areas.
7. Both farmers and extension workers perceived the performance of the input marketing system after reforms as poorer compared to the system before the reforms due to the following reasons.
  - (i) Supply of inputs was unreliable.
  - (ii) Inputs prices were too high and unstable.
  - (iii) Supply of inputs was mostly confined to urban areas.

- (iv) Quantities and types of inputs supplied at a time were inadequate.
  - (v) Inputs supplied by some of the input suppliers and traders were of low quality.
  - (vi) Credit inputs were not accessible to farmers.
8. The study also showed that reforms in the marketing of agricultural inputs had affected delivery of extension services to farmers because agricultural inputs were not accessible to the farmers. As a result, delivery of extension services concerning improved technologies and adoption of such technologies by farmers was also negatively affected.

## 5.2 RECOMMENDATIONS

Based on the conclusions drawn from the findings the following recommendations are made.

1. The study showed that inputs were not accessible to farmers due to high input prices and unavailability. If the government's objective is to ensure adequate food availability, it has to ensure that agricultural inputs are available to farmers at the right time, right place and at relatively affordable prices or on credit. In view of this recommendation farmers, among other things, should be advised and encouraged to mobilize themselves into genuine Savings and Credit Cooperative Societies (SACCOs). The SACCOs will not only unite farmers and hence increase their bargaining power in the marketing of maize and other crops, but also make farmers accessible to loans from financial institutions and other lending organisations. In addition, SACCOs can engage themselves in distribution of inputs in the rural areas.

2. The study indicated that farmers have abandoned the use of basal fertiliser in favour of top dressing fertiliser as a measure to cut down production costs. Likewise, smallholder farmers using agricultural inputs whether at recommended rates or not had declined after the reforms. While use of top dressing fertilisers alone can work as a temporary measure, its effect in the long run is not only detrimental to the soil, but also to the environment in general. Since the major problem for not using basal fertiliser revolves around costs, it is recommended that extension workers should encourage and advice farmers to use less expensive and available alternatives such as famyard manure, Rock phosphate and/or compost manure from crop residues.
3. In order to improve availability of agricultural inputs in the rural areas, it is recommended that the government and the Local government authorities should develop medium and long term rural road improvement strategies to ensure continued maintainance of rural roads.
4. Concerning the quality of inputs, it has been noted that both farmers and extension workers expressed dissatisfaction with the quality of inputs after market reforms. This is a serious problem and if it is not controlled, it may eventually discourage farmer's use of agricultural inputs. Although there are institutions responsible for quality control; the chain through which a product pass, say from the importer to the end user, is long involving people with different levels of education, interest, and experience in handling of inputs. In addition, quality control at retail level is very limited or non-existent. Lack of effective quality control may create opportunities for intentional or unintentional adulteration of inputs, which can go without being checked. In view of this, it is

therefore recommended that,

- (i) the government should decentralise some of the regulatory functions at least to the regional level.
- (ii) the government should strengthen the human resource capacity of the regulatory system to increase its efficiency.
- (iii) The government should provide training to input suppliers and traders on input handling.
- (iv) Local government authorities should enforce by-laws to ban sale of inputs in the local markets or repackaging by unauthorised and unlicensed dealers within their areas.

## REFERENCES

- Ashimogo, G. (1995). *Peasant Grain Storage and Marketing in Tanzania: A Case Study of Maize in Sumbawanga District*. A published Ph.D. dissertation, Shiften Zur International Agraren wicklung Band 15, Verlag Koster, Berlin. pp 369.
- Babbie, E. (1990). *The Practice of Social Research*. Second Edition, Bettmont, C.A. Wadsworth Pub. House. 1 pp.395.
- Bagachwa, M. S. D. (1991). *Choice Technology in Industry: The Economics of Grain Milling in Tanzania*. Ottawa IDRC.
- Bagachwa, M. S. D.; Sechambo, F. C.; Sosovele, H.; Kulindwa, K. A.; Naho, A. A. and Cromwell, E. (1995). *Structural Adjustment and Sustainable Development in Tanzania*. Dar Es Salaam University Press, DSM. pp 94-95.
- Blackie, M. J. (1990). Maize Self-Food Sufficiency and Policy in East and Southern Africa. *Food Policy* 15(5), 383-394.
- Booth, D. (1991): Timing and Sequencing of Agricultural Policy Reform. The Tanzanian Case. *Development Policy Review* 9, 345-379.
- Boyd, H.K.; Westfall R. and S.F.Stasch, (1981). *Marketing Research; Texts and Cases*. Richard D. Publisher. Illinois. pp 813.

Caliendo, M. A. (1979). *Nutrition and the World Food Crisis*. Macmillan Publishing Co. Inc. New York and Collier Macmillan Publishers, London pp. 368.

Chantalakhan, C. (1990). *Small Farm Animal Production and Sustainable Agriculture* ASPAC Food and Fertiliser Technical Center Extension Bulletin No. 309, Bangkok Thailand, pp 17.

Cresswell, J. W. (1994). *Research Design: qualitative and quantitative approaches*. SAGE Publications London. Thousands Oaks, New Delhi. pp.228.

Dabek, A. J. (1994). Report on a Consultancy Mission for the Preparation of an Integrated Pests Management Programme for the Southern Highlands Tanzania. FAO, Rome pp 117.

Dapaah, S. K. and Ontikorang, E.S. (1990). The Place of Fertiliser in Ghana's Quest for Increased Agricultural Productivity. In: *Fertiliser Policy in Tropical Africa* (Edited by Tshibaka, T. B. and Baanate, C .A.) IFDC, Alabama, IFPRI Washington DC, pp 31-45.

Darius, M. (1994). Tanzania: Resolute Action. In: *Adjustment in Africa. Lessons from Country Case Studies* (Edited by Ishrat, H. and Rashid, F.) World Bank Regional and Sectoral Studies. World Bank, Washington DC.

ESRF, (1999) A 2025 Vision for Food and Agriculture: Tanzania January, 1999 pp 36.

FAO (1989). *National Fertilizer Policy Study*. Mission Report. FAO, Fertilizer Programme Tanzania.

FAO (1991). *Tanzania Comprehensive National Food Security Programme*. Assessment and Issues Paper. The Nature of Food Security Problem in Tanzania. FAO, Rome.

FAO (1995). Human Resource Development in Developing Country Issues. In: *World Agriculture Towards 2010*. An FAO Study. (Edited by Alexandros, N) FAO and John Willey and Sons. Chichester. pp 338-347.

FAO (1998). *Women, Agriculture and Rural Development*. Fact Sheet: Tanzania. FAO, Rome, pp 1-2.

FAO (2000). *Fertilisers and Their Use*. A Pocket Handbook for Extension Officers. Fourth Edition FAO/ IFIA, Rome, pp. 70

Fontaine, J. M. and Sindzingre, A. (1991) Macro- Micro Linkages: Structural adjustment and Fertiliser Policy in Sub- Saharan Africa. Technical Paper no 49 OECD Development Centre, Paris.

Hawassi, F. G. H. (1997). The Effects of Fertilizer Subsidy Removal on Fertilizer use and Production of Maize in Mbinga District. (Unpublished) MSc Thesis. Sokoine University of Agriculture, pp. 151.

Hella, J. P. (1995). The Macroeconomic Reforms and their Implications for Future Demand for Agricultural Extension Services in Tanzania. *In: Proceedings of a National conference on the Future of Agriculture Education and Extension in Tanzania*. (Edited by Lugeye *et al*) November 27-29, 1995; Dodoma, Tanzania. Tanzania Society of agricultural Education and Extension and Canadian Society for Extension pp. 21-28.

HIID and EPD Department, Government of Malawi (1994): Fertiliser Policy Study: Market Structure, Prices, and Fertiliser use by Smallholder Maize Farmers. Lilongwe, Malawi. HIID and EPD Mimeo.

Heisey, P. W. And Smale, M. (1994) Gendered Impacts of Fertiliser Subsidy in Malawi and Cameroon. A comment. *Agricultural Economics* 10, 95 - 99

Howell, J. (1988). *Training and Visit Extension in Practice*. Agricultural Administration Unit Occasional Paper 8. Overseas Development Institute pp.107

Howlett, D. and Nagu, J. (1997). *Agricultural Project Planning in Tanzania*. A handbook on Cycles and Sequences, Participation, Identification, Planning and Design, Economic and Financial Analysis and Environmental Assessment of Agricultural Project. IDM Mzumbe and Development Project Planning Centre University of Bradford, UK. pp.289

Iringa District Council, (1997). *Iringa District Socio-Economic Profile* Planning Commission/ IDC DSM pp 105.

Iringa Regional Commissioner's Office, (1998). *Iringa Region Socio-Economic Profile*.

Planning Commission DSM.pp.180.

Ishuza, S. L. B. (1986). The Role of Agricultural Sector Planning in the Development of Smallholder Farmers in Tanzania. Paper presented at the Workshop on Agricultural Sector in Tanzania, September 4-6 Dar Es Salaam. pp.-3.

Johnson, F. B. (1989). "The Political economy of Agricultural development in Kenya and Tanzania". *Journal of Food Research Institute Studies*. 21(3),13 - 18.

Kashuliza, A. K. and Mbiha, E. R. (1995). Structural Adjustment and the Performance of the Agricultural Sector in Tanzania; 1980-1990. In: *The Tanzanian Peasantry. Further Studies* (Edited by Foster, P. G. and Maghimbi, S.) Averbury, Aldershot; UK pp. 51-59.

Kirby, R (1994). Evaluation, Recent development and Prospects in the Regional Bean Networks in Africa. In: *Proceedings of the 8th Bean Research Workshop*. (Edited by G. P. Msumali and R. B. Mabagala) Sokoine University of Agriculture Morogoro Tanzania. Bean Research Vol.8. pp 3-4.

Lupatu, M. A. (1995). Privatization of Extension Services. In: *Proceedings of a National Conference on the Future of the Agricultural education and Extension in Tanzania*. (Edited by Lugeye *et al*) November 27-29, 1995; Dodoma, Tanzania. Tanzania Society of Agricultural Education and Extension and Canadian Society for Extension pp 21-28.

Lyatuu, G. G. I. S. (1994). The Role of Credit in the Adoption of Improved Agricultural Technologies by Smallscale Farmers: A Case Study of Maize Growers in the Southern Highlands of Tanzania. MSc Dissertation Unpublished. SUA, Morogoro pp 78.

Lyimo, N. G. and Temu, A. E. M. (1994). The Southern Highlands Maize Improvement Programme. Achievements and Strategies for Future Research. Uyole Agricultural Centre. pp. 20.

Mahundaza, J. S., Mollel, O. L. and Bhahembura, N. M. (1992). *The Study on Inputs Supply, Distribution and Performance of Liberalization of Inputs Distribution System*. Fertilizer, Final Report Vol. 2. Ministry of Agriculture and Co-operatives pp. 1-126.

Marandu, W. Y. F., Moshi, A.J., Mduruma, Z.O. Lymo, N.G., and Akoonay, H. B. (1988). Development of Maize (*Zea mays* L.) for target environment in Tanzania. In: *Proceedings of the First Tanzania Maize Research Workshop* (Edited by A. J. Moshi and J. K. Robinson) September 6 - 9, 1988, Arusha. Tanzania Agricultural Research Organisation (TARO) DSM Tanzania pp 11 - 16

Marketing Development Bureau, (1997). *Agricultural Inputs Market Review 1996/97* (Ministry of Agriculture and Co-operatives, Dar es Salaam pp. 48.

Mattee, A. Z. (1989). Organization and Management of Agricultural Services for Small Farmers in Tanzania. A Research Paper submitted to FAO, Sokoine University of Agriculture, Morogoro.

Mbelle, A. (1990). Efficiency of Performance Under Structural Adjustment Programmes: The Case of Textile Manufacturing in Tanzania. *Tanzania Journal of Economics*. 2 (1), 23 - 31.

Mbiha, E. R. (1993) Staple Food Market Control Policy Alternatives. The Case of Two Regions in Tanzania. PhD Thesis (Unpublished), Department of Agricultural Economics, Wye College, University of London. pp.215.

Minde, I. J. (1991). Factors affecting Agricultural Marketable Surplus in Tanzania. The case of maize. In: *Issues in African Rural Development* (Edited by Cheryl R. Doss and Carol Olson) Winrock International Institute for Agricultural Development pp 510.

Ministry of Agriculture and Co-operatives (1983). *Agriculture Policy*. Government Printers, Dar es Salaam pp.35.

Ministry of Agriculture and Co-operatives (1996a) *National Sample Census of Agriculture 1993/94 Tanzania Mainland Report Vol.III* Ministry of Agriculture DSM.pp.19.

Ministry of Agriculture and Co-operatives (1996b) *National Sample Census of Agriculture 1994/95 Tanzania Mainland Report Vol.III* Ministry of Agriculture DSM.pp.50.

Ministry of Agriculture and Co-operatives (1997a). *Agriculture and Livestock Policy* Government Printers, Dar es Salaam.pp. 35

Ministry of Agriculture and Co-operatives (1997b). *Agricultural Inputs Study Final Report* Dar es Salaam pp.87.

Ministry of Agriculture and Cooperatives (1998). *Basic Data: Agriculture and Livestock Sector 1991/92-1997/98*. Ministry of Agriculture Dar-es-Salaam pp 50.

Ministry of Agriculture and Cooperatives/National Bureau of Statistics, (1998). *Expanded Agriculture Survey 1996/97 Tanzania Mainland. Vol.II (Main Report)* Ministry of Agriculture and Cooperatives DSM. pp.100.

Ministry of Agriculture and Cooperatives/National Bureau of Statistics, (1999). *Expanded Survey of Agriculture in 1995/96 Tanzania Mainland. (Main Report)* Ministry of Agriculture and Cooperatives. pp.37.

Ministry of Agriculture and Cooperatives (2000). *The Need for Agricultural Extension Reform in Tanzania. Report of the Task Force on Agricultural Extension Reform Review of Literature Vol. 1 (Draft)*. Ministry of Agriculture and Cooperatives DSM pp 103

Moshi, A., Anandajayasekaran, P., Kaliba, A., Martella, D., Mwangi, W., and Shao, F. (1997) *Economic Impact of Maize Research in Tanzania*. Southern Africa Centre for Cooperation in Agricultural and Natural Resources Research and Training. Gaborone Botswana, pp 141.

Moshi, H. P. B. (1995). Parastatal Sector Reform and Private Sector Development in Tanzania. *In: Beyond Structural Adjustment Programmes in Tanzania*. (Edited by Msambichaka, L. A. Kilindo, A. A. L. and Mjema, G. D.). Economic Research Bureau University of Dar es Salaam pp 171-187.

Mpango, P. I. (1994). The Role of Taxation in Structural Adjustment and Economic Stabilization: The Experience of Tanzania. 1980/81 - 1992/93. *In: Tanzania Economic Trends. Quarterly Review* Vol. 6 No.4 January, 1994. pp 47 -59.

Msambichaka, L. A. and Naho, A (1995). Agricultural Sector Performance under SAP in Tanzania. Promising or Frustrating Situation? *In: Beyond Structural Adjustment Programme in Tanzania. Success, Failure and New Perspective*. (Edited by Msambichaka et al) DSM. pp. 29-67

Msambichaka, L. A.; Ndulu, B. J. and Amanti, H. K. R. (1983). *Agricultural Development in Tanzania: Policy Evolution, Performance and Evaluation. The First Two Decades of Independence*. Friedrich-Ebert-Stiftung Germany. pp 155.

- Ndulu, B. J. (1993). Tanzania Economic Development Lessons from the Experience and Challenges of the Future. *In: Development Challenges and Strategies for Tanzania. An Agenda for the 21<sup>st</sup> Century.* (Edited by Msambichaka *et al*). Dar es Salaam University Press, Dar es Salaam. pp 3-24
- Nkonya, E.M. and Parcell, J.L. (1999). Redistribution of Social Benefits from Advances in Extension and Research in the Tanzania Maize Industry. *Journal of the International Association of Agriculture Economists.* 21(3), 231-239.
- Osburn, D. O. and Shneeberger K. C. (1983). *Modern Agricultural Management. A systems Approach to Farming.* Second Edition A Prentice-Hall, Co. USA.
- Pinstup- Andersen, P.(1993) The Role of Fertilisers. *In: Agricultural Research and Technology in Economic Development* (Pinstup-Andersen (ed)) Singapore Singapore National Printers Pte. Ltd. pp 148 - 175.
- Ponte, S. (2000). Policy Reforms, Market Failures and Inputs Use in Africa Smallholder Agriculture. Unpublished Research Paper pp 30.
- Reed, D. (1996). *Structural Adjustment, the Environment and Sustainable Development.* Earthscan Publications Ltd. London. pp 107-127.
- Rutatora, D.F. and Rutachokoziwa, V. (1995). The Future of Agricultural Education and Extension in Tanzania. Issues to be re-examined by the Extension Services in the year 2000 and beyond. *In Proceedings of a National*

*Conference on the Future of Agricultural Extension and Education in Tanzania.* (Edited by S.C. Lugeye and I.L. Ishuza). November 27-29, 1995  
Dodoma Tanzania. TSAEE and CSE pp 86-94.

Sechambo, F. and Kulindwa, K. (1995). Environmental Implications of Economic Reform Policies for Agricultural Development in Tanzania. In: *Policy Reform and the Environment in Tanzania*. (Edited by M.S.D. Bagachwa and F. Limbu). Dar Es Salaam University Press/ Friedrich Ebert Stiftung. pp 89-118.

Shayo, E. S. (1990). A Study of Farmer's Involvement in the Sokoine Extension Project in Morogoro Tanzania. Unpublished MSc Thesis. National University of Ireland pp. 52.

Turuka, F. M. (1995). *Price Reform and Fertilizer Use in Smallholder Agriculture in Tanzania*. L.T. VERLAG MUNSTER-Hamburg Germany. pp 264.

United Republic of Tanzania (1986; 1987; 1988; 1989; 1994). *"Hali ya Uchumi wa Taifa*. Government Printers DSM.

United Republic of Tanzania (1988). *National Population Census* Census Results in Brief. Bureau of Statistics/ Planning Commission DSM, pp 103-110.

United Republic of Tanzania/World Bank (1994). *Tanzania Agriculture*. World Bank Washington DC. pp.125

United Republic of Tanzania (1996). *National Sample Census of Agriculture 1994/95*.

Tanzania Mainland Report Vol.III. Planning Commission/Ministry of Agriculture.  
pp. 50.

United Republic of Tanzania (1998a). *The National Poverty Eradication Strategy*

Government Printers DSM. pp58.

United Republic of Tanzania (1998b). *"Hali ya Uchumi wa Taifa Katika Mwaka 1997"*

Government Printers DSM. pp 243

United Republic of Tanzania (1999a). *Poverty and Welfare Monitoring Indicators*

November 1999 Dar es Salaam. pp76.

United Republic of Tanzania (1999b)..*Report of the Special Advisory Committee on*

*Agricultural Development in Tanzania*. Issues and Recommendations Volume 1  
pp 86.

Wangwe, S. M. and Luvanga, N. E. (1990). Technology Transformation in the Third

World. The Case of Tanzania. *Tanzania Journal of Economics* 2 (1), 3-21.

Young, T. R. (1995). *Plant Breeder's Rights in Tanzania*. Legislative Proposal

Regarding the Portection of the Rights of Private and Intitutional Researchers

Regarding the creation of New Varieties and Hybrids with Commercial or other

value. A Report Prepared for the Government of Tanzania. FAO, Rome. pp 67.

**APPENDICES****APPENDIX I: QUESTIONNAIRE FOR SMALLHOLDER FARMERS**

**TITLE: THE EFFECTS OF LIBERALIZATION OF AGRICULTURAL INPUTS**

**MARKETING SYSTEM ON INPUTS USE IN MAIZE PRODUCTION:**

**A CASE OF IRINGA RURAL DISTRICT**

**Respondent's Number:.....**

**Name of Village:.....**

**Name of Division:.....**

**Good morning/afternoon**

**I am Richard S.M.Sirili from Sokoine University of Agriculture. I would like to thank you for agreeing to meet with me today. All the questions I will be asking relate to my research project and any answer or replies made will be kept confidential. No names will be revealed and on the interview itself you will be identified by a number known only to me. My research attempts to:**

- i) Examine the sources of essential agricultural inputs for maize (fertilizer, improved seeds and pesticides) and the accessibility of these inputs to smallholder farmers.**
- ii) Determine the smallholder maize producers requirements for fertilisers, improved seeds and pesticides and the levels of which the requirements are fulfilled by the existing supply system.**
- iii) Identify main constraints faced by smallholder farmers in obtaining agricultural inputs under the present supply system.**
- iv) Assess smallholder farmers attitude toward private input supply system.**

- v) Identify and describe constraints faced by extension workers in delivering extension services to smallholder farmers in liberal inputs market.

### A. SOCIO-ECONOMIC DATA

1. What is your sex?      1. Female      2. Male      [      ]
2. What is your age? ..... years
3. Marital status:      1. Married      [      ]  
   2. Single      [      ]  
   3. Widow      [      ]  
   4. Divorced/separated      [      ]
4. What is the size of your family?
  1. Those below 18 years of age .....
  2. Those above 18 years of age but below 65 years of age .....
  3. Those above 65 years of age.....
5. How many of the family members mentioned in item 4 above who are over 18 years of age
  1. Work on farm full time .....
  2. Work on farm part time .....
  3. Do not work on farm at all .....
6. What is the average annual family income (Tshs)?
  1. Less than 100,000/=      [      ]
  2. 100,000/= to 199,000/=      [      ]
  3. 200,000/= to 299,000/=      [      ]
  4. 300,000/= to 499,000/=      [      ]
  5. 500,000/= and above      [      ]

7. What is your highest level of education?

1. No formal education [      ]
2. Primary education [      ]
3. Secondary education ('O' level) [      ]
4. Secondary education ('A' level) [      ]
5. Other (specify) .....

**B. RESOURCE ENDOWMENT AND ALLOCATION**

8. Do you own land?    1. Yes                      2. No                      [      ]

9. If YES how did you acquire the land?.....

10. What is the size of your farm? ..... acres

11. If No for item 9, how do you get land for your farming activities?.....

12. If the land is hired how much do you pay per acre per season? .....Tshs.

13. Apart from agriculture, what other sources of income do you have?(elaborate)

1. Employment                      2. Non farm activities                      [      ]
3. Pension                      4. Others (specify).....

14. Is there any other member of the household who contribute to the family income from a sources other than agriculture?

1. Yes                      2. No                      [      ]

15. If yes, what is the source of income? (elaborate)

1. Employment [      ]
2. Non farm activities [      ]
3. Pension [      ]

16. Please rank the following sources of income in order of priority or importance to your household income.

1. Agriculture (animal production) .....
2. Agriculture (crop production) .....
3. Pension .....
4. Non farm activities .....

17. Please indicate total revenue accrued from your different sources of income.

Source	Total revenue in TShs per year.
1. Crop sales	
2. Livestock sales	
3. Non-farm activities	
4. Pension	
Grand total	

18. Among the following family expenses which ones are allocated the largest share of the family's total annual income? (rank starting with the one allocated the largest share)

1. Farm activities e.g. land preparation.....
2. Farm inputs.....
3. Health and education.....
4. Household expenses.....

19. Rank the above mentioned family expenses in the order of expenditure priority allocation pattern.

1. Farm activities .....
2. Farm inputs.....
3. Health and education.....
4. Household expenses .....

### C. INFORMATION ON AGRICULTURAL PRODUCTION

20. What are your main crops? (start with the most important ones)

- |        |         |
|--------|---------|
| 1..... | 3. .... |
| 2..... | 4. .... |

21. How much of the land is used for growing maize?.....hectares.
22. On average has the maize yield been increasing or decreasing over years ?
1. Increasing                      2. Decreasing                      [       ]
23. Give reasons for your answer in item 22.....

#### D. CROP MARKETING

24. What channels do you use to sell maize ?
1. Co-operative society                      [       ]
2. Private traders (give examples)                      [       ]
3. Both [       ]                      4. None                      [       ]
25. How do you compare the present and past crop marketing system?
1. Better                      [       ]
2. No difference                      [       ]
3. Poor                      [       ]
4. Worse                      [       ]
26. Give reasons for your answers in Q.25 ?.....
27. What criterion do you consider when selecting the channel to sell your produce.
1. Price offered                      [       ]
2. Honesty of the traders                      [       ]
3. Prompt payment                      [       ]
4. Costs associated to marketing (specify)..... [       ]
5. No choice                      [       ]

# **E. USE OF AGRICULTURAL INPUTS**

28. What types of agricultural inputs do you frequently use in maize production?

- |    |                                      |         |
|----|--------------------------------------|---------|
| 1. | Fertilizer only (e.g. CAN, SA, UREA) | [     ] |
| 2. | Improved seeds only                  | [     ] |
| 3. | Pesticides only                      | [     ] |
| 4. | Fertilizers and seeds                | [     ] |
| 5. | Fertilizer and pesticides            | [     ] |
| 6. | Seeds and pesticides                 | [     ] |
| 7. | Both                                 | [     ] |
| 8. | Others (specify) .....               | [     ] |

29. Among the inputs you frequently use, which ones are the most important to you? (Rank them in order of importance)

.....Fertilizers

.....improved seeds

.....Pesticides

.....Fertilizer and seeds

.....Fertilizer and pesticides

.....Pesticides and seeds

.....Others (specify).....

30. Among the industrial fertilizers you use which type do you use more frequently ?

- |    |                   |         |    |                          |         |
|----|-------------------|---------|----|--------------------------|---------|
| 1. | Basal fertilizers | [     ] | 2. | Top dressing fertilizers | [     ] |
| 3. | Both of them      | [     ] |    |                          | [     ] |

31. Give reasons for your choice.....

32. What rates do you use for each of the following inputs/acre
1. Basal fertilizers ..... (DAP/TSP)
  2. Top dressing fertilizers ..... (CAN/SA/UREA)
  3. Improved seeds .....
  4. Pesticides(indicate name of pesticide).....
  9. Others (specify) .....
33. What rates were you using before inputs marketing were liberalized?
1. Basal fertilizers ..... (DAP/TSP)
  2. Top dressing fertilizers ..... (CAN/SA/UREA)
  3. Improved seeds .....
  4. Pesticides(specify).....
  9. Others (specify) .....
34. On average how much do you harvest from one hectare of maize if
1. You do not use inputs at all.....bags
  2. You use inputs the way you do (indicate them).....bags.
35. In your opinion, what are the major factors influencing the use of the following inputs ?
- Fertiliser.....
- Improved seeds.....
- Pesticides.....

#### F. INPUTS AVAILABILITY

36. Before 1992 where were you obtaining agricultural inputs for maize ?

Type of input	Source	Mode of purchase

37. Are there regular private inputs traders in your village ?  

1. Yes	2. No	[      ]
--------	-------	----------
38. If yes, when did they start to operate in your village ?.....
39. What type of inputs did they sell/supply regularly ?.....
40. When did you start purchasing inputs from the private traders ?.....
41. How far is it from your home to the nearby reliable source of inputs .....kms
42. Please indicate the mode of transport used and the costs of transportation involved to transport inputs from the buying center to your home.

Input	Distance range	Reliability	Means of transport	Unit cost/input unit (TShs)	Individuals fare (Tshs)	Total cost (Tshs)

43. Does agricultural inputs arrive at your village on time?
1. Yes                                  2. No                                  [       ]
44. What inputs do frequently arrive late ? .....
45. How do you solve the problem of late arrival of inputs.....
46. Are agricultural inputs more available now than it was before liberalization ?
1. Yes                                  2. No                                  [       ]
47. Give reason(s) for your answer in item no 46.....
48. Have you ever changed the rate of inputs application as a result of change in price or availability of inputs ?
1. Yes                                  2. No                                  [       ]

49. If yes, please indicate in the table below the following

Type of input	Season	Rate before	Rate after	Reason

50. In case inputs are not available to you, What alternatives do you have ?

Type of input	Available alternative	Season practiced

51. How did you get to know about these alternatives ?

1. Personal initiative
2. Advise from extension worker [      ]
3. Advise from other farmers
4. Others(specify).....

52. Do you obtain the same results by applying the alternatives in terms of production ?      1. Yes      2. No      [      ]

53. If Yes ,what changes in production have you experienced ?

.....  
 .....

54. Indicate in order of priority,sources of funds for the purchase of agricultural inputs.

.....Sales of cash crops

.....Sales of food crops

.....Borrowing from individual villagers

.....Bank loans

.....Others(specify)

55. What constraints do you face in obtaining agricultural inputs ?

.....

56. What is your opinion on the performance of the current inputs marketing system?

1. Highly reliable [ ]

2. Reliable [ ]

3. Moderately unreliable [ ]

4. Highly unreliable [ ]

57. Give reason(s) for your answer in item 58.....

#### G. ACCESS TO CREDITS

58. Do you have any access to credits for farm inputs?

1. Yes 2. No [ ]

59. If Yes, please indicate the source, type and crop for which the credit was used

Crop	Type of credit	Inputs covered	Source of credit	Terms of recovery	Reliability of the source

#### H. INFORMATION ON EXTENSION SERVICES TO FARMERS

60. Do you have an extension worker in your village ?

1. Yes 2. No [ ]

61. If YES, how often do you meet with him or her ?.....

62. What kind of advice do you get from the extension worker ?.....

63. Under the current situation i.e. after liberalization; does the advice provided by the extension worker prove to be applicable ?

1. Yes                      2. No                      [     ]

64. Give reasons for your answer in item 63.....

65. What areas in the present extension services do you think needs to be re-addressed so as to make extension services more useful or responsive to the farmers ?.....

66. Give reasons for your answers in item 65.....

**THANK YOU FOR YOUR COOPERATION**

## APPENDIX II: QUESTIONNAIRE FOR EXTENSION WORKERS

Respondent's No.:.....

Date:.....

Work station:.....

### INTRODUCTION

Dear respondent,

The purpose of this research project is to assess the effects of the current agricultural inputs marketing system on smallholder maize production in Iringa district. The intention is to come up with plausible recommendation which might be useful to concerned authorities to improve the situation if the need arise. I am asking for your co-operation in this task while assuring you that your responses will be treated confidentially.

### A. GENERAL INFORMATION

1. What is your highest level of professional training?

- |    |                          |           |
|----|--------------------------|-----------|
| 1. | Certificate              | [       ] |
| 2. | Diploma                  | [       ] |
| 3. | Degree                   | [       ] |
| 4. | Others(specify). . . . . | [       ] |

2. For how long have you been working at this station ?..... years

3. How many villages do you serve ? ..... villages.

**B. INPUTS USE AND AVAILABILITY**

4. What type of inputs are used more frequently by the majority of the smallholder farmers in your area?

1. Fertilizers .....
2. Improved seeds .....
3. Pesticides .....
4. Fertilizer and seeds .....
5. Fertilizer and pesticides .....
6. Seeds and pesticides .....
7. All of them.....

5. How readily are these inputs available to farmers in your area ?

1. Readily available and on time [      ]
2. Readily available but not on time [      ]
3. Available in time but not sufficient [      ]
4. Availability and timing not reliable [      ]
5. Not available at all at the village or nearby [      ]
6. Readily available and on time but prices are too high for most of farmers [      ]

6. In case agricultural inputs are not available/not easily available to your farmers how do you assist them to solve the problem ?

1. Advice to use locally available materials [      ]
2. No way to assist them [      ]
3. Others(specify)..... [      ]

7. In the space provided please indicate the consumption of different agricultural inputs in maize production

INPUT			
Chemical fertiliser	Improved seeds	Pesticides	Others(specify)

**\*Ranking**

- |           |        |
|-----------|--------|
| 1. High   | 3. Low |
| 2. Medium | 4. Nil |

8. In the past five years has there been a change in the rates of inputs used by farmers in maize production ?

1. Yes                      2. No                      [       ]

9. If Yes for each of the inputs mentioned below, indicate the previous and current rates used.

INPUT	PREVIOUS RATES	CURRENT RATES
Chemical fertilisers		
Improved seeds		
Pesticides		

10. Does removal of inputs subsidy has any effect on the farmers use of inputs on maize production at your area ?

1. Yes 2. No [ ]

11. If Yes indicate the following

Type of input	Effect of subsidy removal	Effect on production

12. What is likely to be the future situation concerning farmers use of agricultural inputs in maize production ?

1. ☐ Input use will increase [      ]
2. ☐ Input use will decrease [      ]
3. ☐ No change [      ]

13. Give reasons for your answer in item 12

Input	Future trend in use	Reasons

14. For how long private traders/inputs suppliers have been operating in your village/division/district ?.....years.

15. Is there any work relationship between you or your office and the inputs suppliers/traders ?    1.    Yes                      2.    No                      [      ]

16. If Yes, what kind of relationship is there ?

1.      Seeks technical advice on inputs handling [      ]
2.      Seeks advice on types and quantities to be supplied [      ]
3.      Collection of data for inputs supplied [      ]
4.      Others (specify)..... [      ]

17. If you compare the present and the past input supply system, which one is more effective ?.....

18. Give reasons for your answer in item 17. ....

**C. MAIZE PRODUCTION AND MARKETING**

19. Among the crops grown in your area , what position does maize occupy as  
 Food crop..... Cash crop.....
20. In your opinion are there any effects on maize production resulting from the liberalization of inputs marketing ?
1. Yes 2. No [ ]
21. If Yes, what are the positive effect(s) ?.....
22. What are the negative effect(s) ? .....
23. What is the trend in maize production since liberalization of markets for both produce and inputs ?
1. Production have increased significantly [ ]
2. Production have decreased significantly [ ]
3. There is no change in production [ ]
4. Others(specify)..... [ ]
24. Give reasons for your answer in item 23.....
1. High producer prices [ ]
2. Easy availability of inputs [ ]
3. Prompt cash payment for produce sold [ ]
4. Non availability of agricultural inputs [ ]
5. Low producer prices [ ]
6. High prices for agricultural inputs [ ]
7. Opening of new farms [ ]
8. Others(specify)..... [ ]

25. What is likely to be the future trend in maize production

- |    |   |         |
|----|---|---------|
| 1. | Production will increase                | [     ] |
| 2. | Production will decrease                | [     ] |
| 3. | Any change will depend on market forces | [     ] |
| 4. | Others (specify).....                   | [     ] |

26. Is there any reliable markets for the maize produced ?

- |    |     |    |    |         |
|----|-----|----|----|---------|
| 1. | Yes | 2. | No | [     ] |
|----|-----|----|----|---------|

27. How does the marketing situation affect maize production ?.....

#### D. DELIVERY OF EXTENSION SERVICES

28. What effects or problems does the present inputs marketing system has on your work as an extension staff ?

**Positive effects**

**Negative effects**

.....

.....

#### E. GENERAL OPINIONS

29. As an extension agent, what is your opinion on the present state of inputs marketing ?.....

30. What is your opinion on the future state of inputs marketing ?

.....

**THANK YOU FOR YOUR COOPERATION**

### APPENDIX III: CHECK LIST FOR INPUT SUPPLIERS AND TRADERS.

Date:.....

Location:.....

#### INTRODUCTION

Dear Respondent,

The purpose of this research is to assess the effects of the current agricultural inputs marketing system on smallholder maize production in Iringa District. The intention is to come up with recommendations which might be considered useful by concerned authorities if a need to improve the situation arise. I am asking for your cooperation in this task and I assure you that your responses will be treated confidentially.

#### A. GENERAL INFORMATION

1. What is the highest level of education of the salesmen /women

- |                                    |         |
|------------------------------------|---------|
| 1. No formal education             | [     ] |
| 2. Primary education               | [     ] |
| 3. Secondary education ('O' level) | [     ] |
| 4. Secondary education ('A' level) | [     ] |
| 5. Others (Specify) .....          | [     ] |

2. Do you or your sells personnel have any professional training related to the inputs you are dealing with ?

1. Yes	2. No	[     ]
--------	-------	---------

3. If YES indicate the following

Types of training	Duration	College

4. If NO, for item 2 how do you deal with technical aspect concerning the inputs you are dealing with ?.....

**B. INPUT DISTRIBUTION**

5. For how long have you being in the inputs business ?.....years
6. Are you a permanent inputs supplier/trader or a seasonal one ?
- |                       |         |
|-----------------------|---------|
| 1. Permanent supplier | [     ] |
| 2. Permanent trader   | [     ] |
| 3. Seasonal supplier  | [     ] |
| 4. Seasonal trader    | [     ] |
7. List down the types of agricultural inputs which you deal with
- |         |         |
|---------|---------|
| 1. .... | 2. .... |
| 3. .... | 4. .... |
8. Where do you obtain these inputs ?.....
9. Do you operated independently or as an agent for another company ?
- |                |         |
|----------------|---------|
| 1. Independent | [     ] |
| 2. An agent    | [     ] |
| 3. Both        | [     ] |
10. If as an agent or both please indicate the type of organization you represent
- |                        |         |
|------------------------|---------|
| 1. Public parastatal   | [     ] |
| 2. Private company     | [     ] |
| 3. Cooperative Union   | [     ] |
| 4. Both (specify)..... | [     ] |



19. If yes, what advise do you provide ?.....
20. As an input supplier are there any problems which face you which are related to your business ? 1. Yes 2. No [ ]
21. If yes, please indicate the following (Rank starting with the most serious problem).

Problem	Effect on supplier/trader	Effect on farmers

22. How do you solve these problems ?.....
23. From your experience in inputs marketing, what is your opinion on the present state of the input market ?.....
24. What is your opinion on the future state of the inputs market ?.....

**THANK YOU FOR YOUR COOPERATION.**

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