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Cassava in Tanzania: A famine or commercial reserve?

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Abstract. Tanzania is one of the largest cassava producers in Africa. About 655,700 ha of land are under cassava with a total annual production of about 1,795,400 tons. Cassava is a staple food crop in most of the semi-arid and the frequently drought stricken areas. For this reason cassava has traditionally been considered a famine reserve crop. The main objective of this paper is to provide evidence that there is an opportunity to change the role of cassava in most farming systems in Tanzania. That cassava is becoming an important source of income (a cash reserve). The paper is based on case studies undertaken in selected villages in Tanzania. The results show that cassava producers/processors can earn as much as Tanzanian shillings 170,000 per month from cassava. This amount is more than three times the minimum wage in Tanzania.

Introduction

Tanzania's agricultural sector. Agriculture has always been considered the backbone of the Tanzanian economy. This is mainly because it contributes a large share of the national output. Lately, it has been estimated that agriculture contributes on average about 50% of Tanzania GDP. Agriculture is also the main foreign exchange earner of the country; the share of the agricultural exports in total exports is estimated at about 56%. Agriculture is also rated as the main employer of the rural population. According to the household budget survey (NBS 2002) 74% and 26% of rural and urban population respectively are engaged in agricultural related activities.

The agricultural sector in Tanzania has been estimated to grow at an average rate of about 3.5% between 1990 and 2001. According to World Bank (2000) export crops (including coffee, cotton, cashewnuts, tobacco and tea) contribute about 9% of the value of agricultural output. Food crops (mainly maize, rice, wheat, sorghum/millet, cassava and beans) account for about 74%. Of this, cassava contributes about 4.5 % (Figure 1). Despite the high contribution of food crops to agricultural output the production growth rate of the food crops has been relatively lower than that of cash crops for example between 1987 and 2001 the six main food crops grew at 3.5% per year while export crops grew at 5.4% per year (Lazaro and Mdoe, 2003). This could partly be due to underestimation of data for food crops but also because the growth of food crops is generally limited by the demand constraint. Food crops are basically limited to the domestic market.

An overview of cassava. Cassava, scientifically known as *Manihot esculenta* Crantz was introduced in Africa in the 16th century by early European traders (FAO, 2000). Cassava is a special crop because of its adaptability to a wide range of ecological and agronomic conditions. Cassava is produced widely in Asia, Latin America and Sub-Saharan Africa as a source of food and cash. Cassava production in Africa increased at a rate of 2.4% per year from 1973-75 to 1983-85 and 4.2 % from 1983-85 to 1993-95 (FAO 2000). Production during 1993-95 was estimated at 83,062,000 tonnes. Major cassava producing countries in Africa include Nigeria,

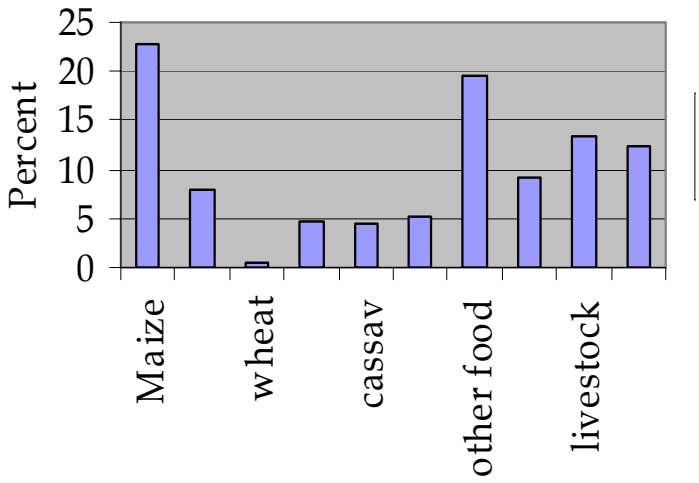

Figure 1: Contribution of cassava to Agricultural Output.

Democratic Republic of Congo and Tanzania. The average annual production of cassava in Tanzania during the 1992-1999 periods was about 1,640 million tonnes (URT, 2000). Major cassava producing regions include Mtwara, Mara and Ruvuma regions. These regions cultivated about 12.2%, 11.7% and 11.3% of total cassava planted area respectively during the 1998/99 season. Large cassava planted areas are also found in Mwanza (8.3%), Kigoma (6.5), Lindi (6.1%), Coast (6.4%), Shinyanga (5.9%), and Kagera (5.9%). The remaining 25.7% planted cassava area is spread in other regions (URT 2001).

Cassava is generally grown on soils with poor fertility, in semi-arid type of climate that is frequently drought stricken. Cassava is known for its ability to do well in poor soils where other field crops can not be grown without substantial input supplementation. Cassava has therefore played a very important role in ensuring food security in most perpetually drought stricken areas. For this reason cassava in Tanzania has often been categorized as a 'famine reserve' crop. This implies that the main objective for cassava production is to serve as a coping strategy against incidences of famine. Cassava farms have in general remained small. During the agricultural survey of 1998/99 about 51% of sampled households cultivating cassava, cultivated between 2 to 5 ha (NBS, 2001).

The majority of cassava producers use traditional production methods. Hand hoes are the main tools used for land preparation, planting, weeding and harvesting. In processing, the main tool used is a knife, although processing machines (manual and powered) have recently been introduced in cassava producing areas. Both men and women are involved in cassava processing but women dominate in the processing. Recent studies conducted in selected regions in Tanzania show that cassava is increasingly becoming an important cash crop. To assess the importance of cassava in Tanzania this paper analyses data from case studies and secondary data from the Ministry of Agriculture. The main objective of this paper is to present evidence of change of the role of cassava in Tanzania from a famine reserve to a cash crop. Cassava is becoming a commercial reserve because of its increased importance as a cash crop.

Methodology

This paper is based on secondary data obtained from the Ministry of Agriculture and Food Security (MAFS) publications in

Tanzania, and The Food and Agriculture Organization of the United Nations (FAO). Primary data from case studies is used to complement secondary data. Case studies conducted in Dar-Es-salaam, Coast and Dodoma regions are used (Lisasi, 2003; Assenga, 2003).

Results and Discussion

Cassava output. Cassava is the most important root crop in Tanzania. According to the 1998/99 agricultural survey (NBS, 2001) total planted area in the sampled households was estimated at 848,126 ha during the 1998/99 season. This made up about 73% of total area under roots and tuber crops (Table 1). Other roots and tuber crops cultivated included sweetpotatoes (23%), irish potatoes (3%), yams and cocoyams (1%).

The survey results also showed that about 21% of total sampled households cultivated cassava and 15% of cultivated area by sampled households was planted with cassava (Table 1). Based on this data cassava is second to maize in terms of the proportion of households cultivating cassava and area under the crop.

Cassava is largely cultivated intercropped with other crops and in some cases in rotation with other crops. Important crop mixtures include:

1. Cassava with maize or cassava with sorghum: this mixture is important in almost all dry areas of Tanzania (e.g Dodoma, Singida, Mwanza, Mara, Tabora, Shinyanga and dry areas of Iringa).

2. Coconut with cassava that is cassava (sometimes mixed with maize) is planted in the coconut field interspaces. This is very common in coastal areas (Mtwara, Lindi, Coast, and Tanga regions).

This cropping system and the fact that cassava is largely harvested piece-meal makes estimation of cassava production very difficult. For this reason there is often a large discrepancy on cassava data from different sources and therefore such data should always be interpreted with caution. The annual cassava production is about 1,600 million tonnes (URT, 2000, URT 1998). The trend in cassava production is shown in Figure 2. The figure shows that cassava production has been increasing from 1960s to early 1990s when production started to decline during 1992-94. One of the reasons for the decline was lack of market for cassava. During the 1980s the National Milling Cooperation (NMC) and regional and district cooperative societies were buying dried cassava from farmers. NMC was established in 1967 as one of the state owned institution

Table 1: Proportion of households cultivating and planted area of food crops.

Crop	Number of holdings	%	Planted area	%
Maize	3,233,640	40	3,010,631.08	55
Paddy	685,257	8	503,532.56	9
Sorghum	866,975	11	551,707.5	10
Bulrush millet	207,671	3	165,918.69	3
Finger millet	192,287	2	90,881.82	1.6
Wheat	60,896	0.8	35,811.92	0.6
Cassava	1,697,321	21	848,125.9	15
Sweet potato	1,017,012	12.6	266,883.58	5
Irish Potatoes	76,427	0.9	28,420.74	0.5
Yam and cocoyam	64,073	0.8	11,437.04	0.2
Total	8,101,559	100	5,513,350.3	100

Source: URT (2001).

that had a legal monopoly of buying and selling food grains including cassava as well as to import and export food (Ashimogo, 1995). Figure 3 shows dried cassava purchases by NMC, the purchases were declining until 1990 where no cassava was purchased. This was mainly because in July 1988 NMC like other state owned institutions, lost its food crops buying monopoly and was not obliged to buy food crops (Turuka, 1995). During 1990/91 NMC ceased to be a major food-marketing agent as credit restriction reduced official purchases (Ashimogo, 1995). Despite the inefficiencies of NMC it ensured a ready market for cassava. This market assurance acted as a stimulus to cassava production and processing.

The lack of reliable market is partly a factor that limits the potential for cassava production in Tanzania. Following the liberalization of markets for agricultural products in 1980s marketing of cassava like other agricultural products was left in the hands of private traders. This change has negatively affected the marketing of dried cassava. The majority of private traders are more involved in trading high value cereals such as maize and rice. The few who are still interested in cassava confine their activities to more accessible areas. The few traders who operate in less accessible areas normally face little or no competition and hence offer low prices, resulting into low returns from cassava.

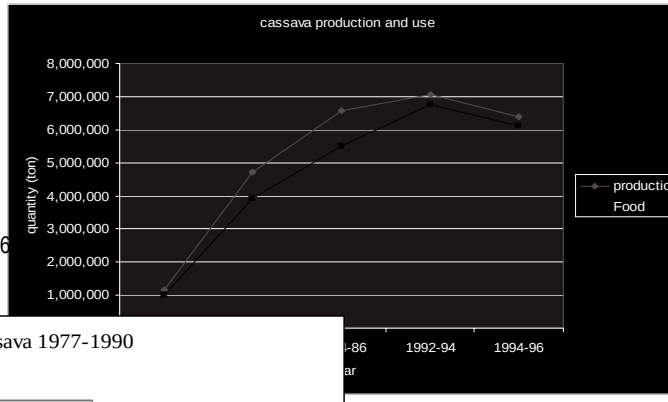

Figure 2: Dried cassava production and use 1964-1996

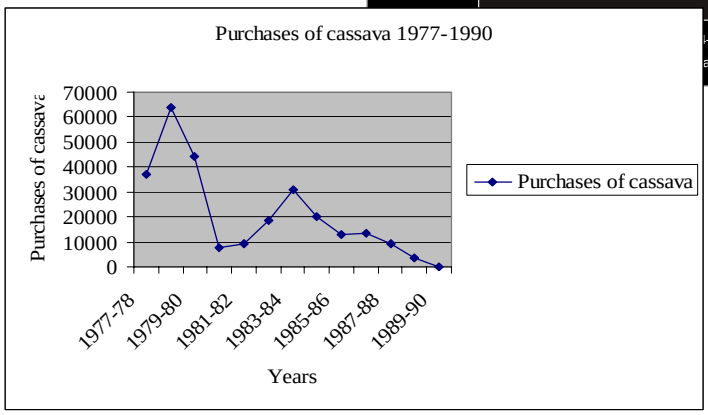

Figure 3: Trends in cassava purchases by NMC (Source URT 1992).

The market prospects for cassava will therefore depend on adding value to cassava through processing and utilization.

Cassava processing and utilization. Domestic use of cassava is largely limited to food (Figure 2). Both cassava roots and leaves are consumed. Roots are rich in carbohydrates while leaves are rich in proteins and minerals. Data on use of cassava leaves is however not documented thus this section will focus more on cassava roots**.** About 96% of cassava produced during 1992-94 and 1994-96 was used for food. Whereas between 1979-81 and 1984-86 the proportion of cassava that was used for food was 83% and 84% respectively. The trend in the per capita consumption of cassava is indicated in Figure 4. The figure shows that there was a decline in consumption during the period 1992-94. At this time production started to decline. The decline of per capita cassava consumption can as well be explained by the fact that in 1990 NMC the sole buyer and seller of dry cassava was dissolved. This limited the amount of cassava marketed and therefore reduced dramatically the consumption of cassava.

During the 1960s up to late 1980s some cassava was exported by NMC, and it made up about 52% of total quantity of food crops exported by NMC. NMC stopped exporting cassava during 1987/88. Even then the export level for cassava was very low. The low volume of cassava export and alternative uses such as feed have limited the potential for cassava as a commercial crop in Tanzania. Empirical evidence has shown that cassava producers in Tanzania could increase cassava production if alternative uses of cassava are introduced (Shem *et al*., 2003). The data showed that area under cassava production in two villages in the Coast region more than doubled (from 168.5 acres to 375.5 acres) between 2000 and 2003 after introducing the processing of cassava-based feed in the region

The utilization of cassava roots is sometimes limited by the toxicity of some cassava varieties. The toxic substance-cyanide contained in some cassava varieties is harmful to humans. The consumption of these varieties requires processing to reduce the levels of toxic cyanide to non-toxic levels. There are many cassava-processing procedures. Broadly it involves cutting the roots (peeled or unpeeled) into smaller pieces and drying (with or without fermentation). Three reasons that make cassava processing critical are: i) to reduce or remove the toxicity ii) to minimise losses from its perishability and iii) to reduce its bulkiness. Cassava processing therefore increases the value of cassava. A

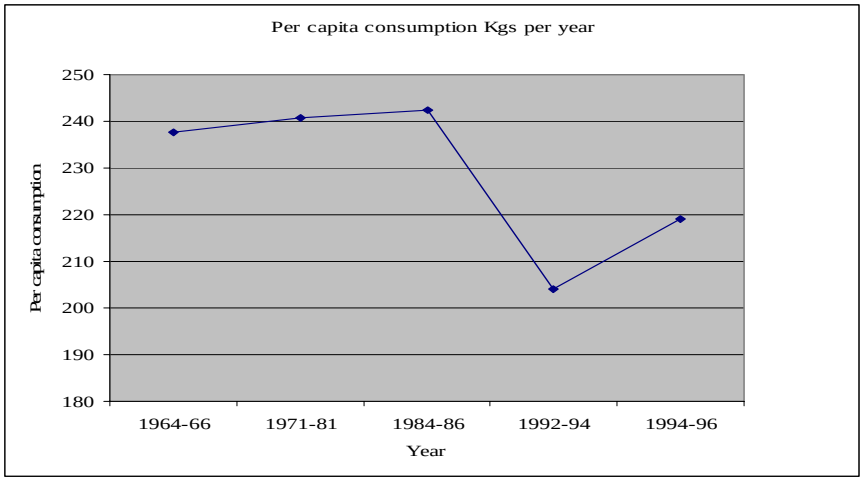

Figure 4: Per capita consumption of cassava.

case study conducted in the Coast region showed that the value of cassava in a domestic market increased by 32% compared to the value of an equivalent quantity of fresh cassava (TARPII-SUA, 2002). According to Nweke *et al*. (1998) about 75% of total cassava produced in Tanzania is processed while only 25% is used fresh. Cassava processing is largely done at household level where small quantities are processed for consumption and for sell in local markets. Introduction of simple cassava processing machines (chippers and graters) has been reported to increase levels of cassava processing (Mutayoba *et al*., 2003). Industrial cassava processing in Tanzania is very limited. A cassava starch-processing factory was established in the lake zone cassava producing area but is not operational partly because of the limited supply of raw cassava.

Cassava commercialisation. For the majority of the rural population, agriculture is the main source of income. They generate income through sales of crops and/or livestock and livestock products. Data presented earlier shows that cassava in Tanzania is largely used for food. However, it is argued in this paper that cassava has a high potential to be a commercial crop or a source of income. Cassava generally competes with the traditional cereal crops. However, studies have shown that one of the main cassava advantages over cereal production is its low cost of production. A case study in the Coast region of Tanzania showed that the cost of production of cassava was about 62% less than that for paddy. For this reason although the market price for paddy is higher than that for cassava the returns to cassava production are generally higher than that for rice. Data from the coast region showed that the returns to cassava production were 22% higher than that for rice (TARP II-SUA. 2002).

A case study conducted in Dar-es-Salaam showed that cassava traders earned as high as TAS 170,000 per month on selling cassava flour in the local markets. In Dodoma region, cassava processors earned as high as TAS 59,000 per month. These case studies show that there is potential for commercialization of cassava

Governments efforts to promote cassava. Realizing the importance of cassava the government of Tanzania through the National Agricultural Research System and other institutions such as Universities has made efforts to promote the crop. These efforts include investments in research, and establishment of policy guidelines for cassava production. Cassava research for a long time concentrated on developing better yielding varieties, agronomic practices and control of major pests of cassava. These research activities have often been done in collaboration with international organizations. The main objective therefore was to increase production levels and productivity. Research results show that improved varieties yield upto 25 tonnes per hectare (TARP II-SUA, 2002). The use of such improved varieties resulted into increased net returns to cassava production. It has been estimated that with improved varieties net returns from sell of fresh cassava range between TAS 220,000 and 340,000 per ha compared to traditional varieties that range between 160,000 and 310,000 (TARP II-SUA, 2002). Together with these efforts more research efforts have been recently directed to cassava processing and utilization (Lekule *et al.*, 2002). This include introduction of processing equipment and alternatives to cassava utilization (Silayo, 2003).

Together with research efforts the government made efforts on policy issues. According to the agricultural and livestock policy of 1997(URT, 1997), cassava was identified as one of the crops categorized as non-traditional export crops. However, the export market for cassava is not increasing. It, therefore, requires more efforts to improve the export market of cassava for Tanzania. At regional level, there are efforts as well to improve cassava production. For example in the semi-arid central region of Dodoma cassava was traditionally promoted as a

famine reserve crop. However realizing that cassava plays a bigger role in the region, the local government by-law of 1994 was amended in 2000 and re-categorized cassava as a 'food crop' rather than a 'famine reserve crop' (Lazaro *et al.*, 2003). There have also been government campaigns to promote cassava for food security. These government efforts have been instrument in promoting cassava production in Tanzania.

Implications

The analysis presented in this paper show that there is potential for cassava to be a commercial crop for Tanzania rather than just a famine reserve. There is potential for marketing cassava both domestically and abroad. Evidence has shown that with assurance of a reliable market, cassava production can be increased. It is suggested here that the exploitation of this potential depends largely on improvements in processing of cassava into more products with alternative uses.

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