



**FOOD AND AGRICULTURE ORGANIZATION  
OF THE UNITED NATIONS**



*Commercialization of Cassava for Increased Food Security*  
**Indicative Trends and Patterns  
towards Commercialisation**

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JULY, 2005

## Executive Summary

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1. Maize has been the recognised staple food for most Zambians in rural and urban areas. Food security policies and strategies in Zambia have therefore, remained highly biased towards maize. The danger of over-dependence on maize is that its production is expensive and reliance on it alone narrows the food base, and also makes the national food security system vulnerable to droughts. Maize needs a companion staple and at the moment, the only cost-effective candidate is cassava.
2. Experience in Asia, the Pacific, Latin America, the Caribbean, Central and Western Africa as well as other tropical countries show that when properly promoted and its preparation improved, cassava can be a reliable staple food. In Congo D.R., cassava represents 70% of people's daily calorie intake.
3. In Zambia, trends show a declining pattern of cereal (maize, rice, wheat and sorghum/millet) production per capita in recent years. In contrast, production of starchy (sweet potato and cassava) roots production has been rising.
4. Over 30% of Zambians depend on it as staple food. Its importance is dwarfed by lack of official statistics. Insecurity related to maize production has also driven most farmers back to cassava. Consumer habits and rising cost of living in urban areas are also driving the change in favour of traditional foods. A prolonged and sustained increase in cassava production can only be achieved with better market opportunities created by increased demand in urban markets through domestic and industrial use. Cassava is also a dependable staple in areas where it is grown. Cases of acute food insecurity even during drought years are rare in cassava growing areas of northern Zambia. In contrast, maize growing areas show a high sensitivity to drought and factor prices.
5. Some people argue that cassava is an inferior crop. It might seem so at face value. However, the basic rule of good nutrition is for a balanced diet. Any food, including cereals, consumed on its own is inadequate for optimum human nutrition. Cassava is deficient in some nutrients but is quite rich in others especially energy. Cassava flour is a cheap source of energy comparable to maize and rice since its production cost is lower. The cassava leaf is richer in protein and energy than rape, a commonly accepted urban vegetable. Cassava indeed has some toxic cyanogenic glucoside substances but these can be removed through careful processing and use of sweet varieties.
6. Zambia is in the process of preparing a Fifth National Development Plan (NDP, 2006-2011) under which achievement of sustained agricultural enterprise diversification for food security is expected to remain a key objective as indicated in the National Agriculture Policy.
7. FAO commissioned this small study to discern the indicative patterns and trends in domestic and industrial consumption of cassava as a basis for designing a promotional strategy. The main objective of the study was to reveal some indicative patterns and trends in cassava consumption in urban Lusaka as a basis for designing a sustainable promotional campaign for wider use of cassava.
8. The study adopted a simple random sample to interview 88 consumers in three locations of Lusaka disaggregated by density status. Thirty households each from Avondale, Kamwala and Mtendere, representing a low, medium and high density compound were interviewed. A total of 88 households were covered in the interviews and their responses analysed. In addition, the research team interviewed a range of other players including traders, marketeers, restaurant owners, retail shop managers, NGOs and development agencies thought to deal in cassava and using a checklist.
9. The study found that since the 1930s, cassava has taken root in many areas, especially the high and medium rainfall northern and north-western areas. In recent years, production has been concentrated in Northern, Luapula and North-Western. Some significant populations in Western, Central and Copperbelt provinces have also started producing cassava. Cassava production has also moved slowly but steadily moved to Lusaka, Eastern and Southern provinces as a result of promotion work of Government, NGOs and donor partners. For instance, Mumbwa and Rufunsa supply most of the sweet variety of cassava commonly consumed as raw or boiled tuber in Lusaka.

10. Cassava production is appreciated by subsistence farmers in most parts of Zambia because of its high adaptability to a range of soil, climatic, socio-economic and agronomic-ecological conditions.
11. Cassava can also be processed into a wide range of products, driven by the need to improve its socio-economic appeal among urban consumers, as well as to make it less bulky, more transportable, more storable and easier to prepare. Opportunities to diversify into cassava exist through promoting better varieties of cassava suited for livestock feed, bakery products, industrial starch and human food.
12. The study found that about 97% of the Lusaka households reported having ever consumed cassava in one form or another. About half (53%) regularly consumed cassava. The main forms in which it is consumed are cassava nshima (mostly mixed with maize meal), boiled tubers (from sweet varieties), cassava roasted chips, flour, cassava cake and cassava leaves. People originating from cassava production areas generally consumed more cassava.
13. The main sources of cassava supplies for urban consumers are urban markets (72%), roadside markets (38%) and the village (12%). This indicates a linkage with village flows as all these sources are linked to the villages.
14. An average of 4.7kg per household per month of flour indicates a significant contribution of cassava to the urban diet in some households, considering that cassava is rarely consumed as a whole meal but combined with maize meal in approximate ratio of 5:1 for optimum taste and texture. An average family of six consumes about 50kg of maize meal per month. This works out to a ratio of about 10:1.
15. In terms of residential area which may also indirectly show wealth status, people in high density areas (Mtendere) consumed more cassava per household per month (10.4kg) compared to relatively more affluent areas of Kamwala (9.1kg) and Avondale (7.2kg). This finding is consistent with widely held view that cassava is food for the poor. However, it is encouraging that even in affluent areas, cassava is being seen as a potential food.
16. Within the households, elderly people with memories and contacts with rural life are more likely to consume cassava than the youth. Households headed by people aged above 55 years consumed 9.8 kg per month compared to 6.5 kg per month for households whose heads are aged below 30 years. People from cassava producing areas consumed 12.6 kg per month compared to 4.7 kg per month for non-cassava areas.
17. People from rich residential area spent the lowest on cassava but the middle class spent the highest (K23,050) per month followed by the less affluent (K19,233). Such patterns underline the importance of the middle class as a special target group in cassava promotion. Cassava consumption is rising with income category until K5 million per annum (people most likely to live in affluent Avondale). The average expenditure on cassava was however highest for richer households showing that they buy from more classy places like supermarkets. Thereafter, consumption drops drastically indicating that the super rich are not likely to consume much cassava. Lower income people may be willing to eat more cassava but are constrained by income level. The middle class are therefore, very important for expansion of cassava consumption in urban areas.
18. The main factors constraining increased cassava consumption in Lusaka from the consumer's point of view include lack of interest (51%), inadequate knowledge and low regard (31%), poor availability (28%) and high cost (18%). Other constraining factors are poor selling environment (6%) and processing difficulties (6%).
19. Most consumers were optimistic that cassava consumption can increase if there was increased efforts to sensitize urban people about the nutritive value of cassava (44%), coupled with increased supply (40%). It was mentioned repeatedly that the rising cost of maize meal may drive more people towards diversifying their diet to cassava. The most preferred forms of cassava for future consumption are flour meal (64%) and boiled fresh tubers (49%). For understandable reasons, households with non cassava consuming origins prefer more boiled fresh tubers. Those from cassava consuming origins prefer more of other products.

20. A substantial proportion of major supermarkets and retail shops now stock cassava flour and leaves in Lusaka. There is an emerging cadre of processors ordering cassava chips from the north and grinding to package flour for sale to retail shops.
  21. Most retailers think trade in cassava products is on a booming and thriving pathway with increased turn-over in cassava flour sales. One of them *Chunno Agri-Group Ltd* for instance has a medium sized plant in the Show Ground premises where high quality and well packaged cassava foodstuffs such as garri and cassava flour are manufactured.
  22. Other prominent companies are *Kalundwe Estate* in Central Province, *Namando Investments*, *Chukwuma Ltd and Peco Ltd* that produces high quality cassava flour. Peco Ltd makes biscuits using 20% cassava flour. The other value adding retailers are in the hospitality industry, including hotels and restaurants. Both cassava flour and cassava leaves are becoming popular among urban consumers. *Silva Catering*, *Matebeto* and others report good business and trade for cassava products and other traditional foods. People have realised the value of going back to the roots.
  23. Due to high insecurity and risk, street traders, also wary of competition and trade secrets, were not very forthcoming in responding to the survey. Information on volume of sales and profit was especially sensitive in view of competition. Street trading is scattered all over the Central Business District (CBD) but is spread out as far as the compound markets and outlying areas. The main hindrance factors to increased cassava consumption include lack of knowledge(8), dirty/unhygienic selling place(4), eating cassava lowers dignity(4)and perception that it is bitter (2). The issue of low supplies and high price was also mentioned (2) as a hindrance.
  24. Many of the traders were quite clear on need to be done to commercialise cassava. More education campaigns(11), getting it appeal to children by mixing it with other foods(8), informing people who are unused about the nutritious aspects and preparations(7) and promoting production and preparation in non-traditional areas(5) were common responses. This they felt would lead to flooding the market and reduction in consumer prices (3) and
  25. The main potential industrial users of cassava are starch, bakers, food processors and feed (millers). Little progress has been done to adopt and integrate cassava into industrial products in Zambia but potential exists. Important companies in Zambia include Milling Companies, Zambezi Papermills, Unity Packages, Peco Ltd, Wood Processing Industry, Trishul Company Ltd, Monterey Printers and Biscuit manufacturers. The main factors to consider in industrial use of cassava products include infrastructure, reliable supply of cassava, water supply, power supply and access to land for factories. Availability of skilled labour, drying facilities and market demand size are also important factors.
  26. The promotion of cassava is led by MACO, National Food and Nutrition Commission (NFNC), FRA, NGOs, United Nations and private sector. More efforts to promote cassava are required through improvement of statistics, increased political will through a **National Cassava Initiative** and a **Cassava Development Fund**, and tax and investment incentives for industries that demonstrate adequate integration of cassava as raw material in their products. It is important to encourage all food relief agencies and institutional boards (schools, hospitals, prisons, refugees) to use a proportion of cassava in diets.
  27. There is need to create and raise public and consumer awareness about the potential business opportunities that lie in cassava. There is also need to close this yield gap through yield-enhancing interventions, providing support to small-and-medium-scale processors and entrepreneurs to acquire processing equipment kits, and integrating cassava into agri-business.
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## 28. Table of Contents

EXECUTIVE SUMMARY.....	1
ACRONYMS AND ABBREVIATIONS.....	7
ACKNOWLEDGEMENT.....	8
<b>1.0 INTRODUCTION.....</b>	<b>9</b>
1.1 SOME BASIC FACTS.....	9
1.1.1 Companion Staple to Maize.....	9
Figure 1: Per Caput Food Supply in Zambia: 1964-2004.....	9
1.1.2 Have we reached the Cross Roads?.....	1
Figure 2: Trends in Local Production of cassava and Maize (1995-2005).....	1
1.1.3 Why has Cassava gained in Importance?.....	1
Figure 3: Map showing Districts Requiring Food Assistance in 2002-03.....	2
1.1.4 Is Cassava an Inferior Food?.....	2
Table 1. Nutrient Composition of cassava compared to other foods.....	3
1.2 BACKGROUND TO THIS REPORT.....	3
1.2.1 POLICY FRAMEWORK.....	4
1.2.2 Objectives of the Study.....	5
1.2.3 Methods Used.....	5
Table 2: Sample size.....	5
<b>2.0 CHARACTERISTICS OF CASSAVA.....</b>	<b>6</b>
2.1 ORIGIN AND DISTRIBUTION.....	6
Figure 4: Cereal and Cassava Belts in Zambia.....	6
2.2 BOTANY AND AGRONOMY.....	7
2.2.1 Climatic and Soil Requirements.....	7
2.2.2 Nutritional Characteristics.....	8
2.3 GLOBAL USES AND UTILISATION OF CASSAVA.....	9
2.3.1 Industrial and Culinary Utilisation.....	9
Table 4 Main global utilisation of cassava.....	9
2.3.2 International Trade.....	10
<b>3.0 FINDINGS: PATTERNS OF CONSUMPTION IN LUSAKA.....</b>	<b>11</b>
3.1 DOMESTIC CONSUMPTION OF CASSAVA.....	11
3.1.1 Was Cassava ever consumed?.....	11
Figure 5. Frequency of cassava consumption.....	11
3.1.2 Who consumes and in what forms?.....	11
Figure 6: Forms in which cassava is consumed.....	12
3.1.3 Who consumes what amounts?.....	13
Figure 7. Season of cassava consumption.....	13
Figure 7: Average consumption of all forms of cassava per household per month.....	14
3.1.4 Exploring Income relations with Cassava Consumption.....	15
Figure 8 Cassava preference by age group of household members.....	16
3.1.5 Constraints to Cassava Consumption.....	16
3.1.6 Factors in increased Cassava Consumption.....	17
3.1.7 Government Role in increased Cassava Consumption.....	17
Figure 9 Government role in increasing cassava consumption.....	18
3.2 RETAILING AND TRADING FOR CASSAVA.....	18
3.2.1 Attributes of Retailing.....	19
3.2.2 Views of Street Traders.....	20
Table 17: Checklist of Cassava Traders.....	21
3.3 INDUSTRIAL PROCESSING AND USE OF CASSAVA.....	21
3.4 CASSAVA PROMOTION.....	22
3.5 CHALLENGES AND OPPORTUNITIES.....	23
3.5.1 Low Production and Productivity.....	23
3.5.2 Lack of Processing Technology.....	24
3.5.3 Low Consumer Appeal due to Low diversity of uses in Zambia.....	24
3.5.4 Low Political Will and Institutional Support.....	24

<b>4.0 PROMOTING COMMERCIALISATION OF CASSAVA.....</b>	<b>25</b>
4.1 POLICY AND ADVOCACY .....	25
4.1.1. <i>Improved Statistics and Market Information</i> .....	25
4.1.2 <i>Political will</i> .....	25
4.1.3 <i>Raising Public Profile of Cassava</i> .....	26
4.2 INCREASING PRODUCTION AND PRODUCTIVITY .....	26
4.3 PROCESSING AND UTILISATION: PRODUCT DEVELOPMENT .....	26
<b>REFERENCES .....</b>	<b>27</b>

## Foreword

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The Government of the Republic of Zambia is designing a Fifth National Development Plan (2006-2011). The agricultural sector is one of the economic drivers of development and livelihood stability. However, it has not developed to expectation and the national food system continues to show high vulnerability to climatic, resulting into cyclical national and household food insecurity. This is affecting the overall achievement of macro-economic growth and poverty reduction.

The agricultural sector and the national food system in Zambia needs to be diversified. Zambia is well gifted by nature and has tremendous land and water resources to allow for a diversity of crops. The National Development Plan (NDP) provides an opportunity for reflection on possible medium to long-term development strategies for agriculture and food production. Apart from strengthening national Early Warning and Monitoring Systems, Zambia needs to adopt those crops that can cushion the impact of adverse weather conditions on the food system.

Cassava is one such crop in this diversification strategy. Concerned about apparent low level of interest in cassava, this study sheds some light on consumption patterns of cassava in urban Zambia, being a key consumer market to be targeted for any tangible promotional strategy. It highlights interesting trends showing the growing importance of cassava in the emerging food systems or urban people. Cassava poses an interesting challenge as a dependable complement to maize in Zambia's food system. Lets join forces to promote it.

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Dong Qingsong  
FAO Representative

## Acronyms and Abbreviations

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ACF	Agricultural Consultative Forum
ACP	Agricultural Commercialisation Programme
CBD	Central Business District
CIAT	International Centre for Tropical Agriculture
CIP	International Potato Centre (CIP)
CLUSA	Cooperative League of the United States of America
CSO	Central Statistics Office
FAO	Food and Agricultural Organisation
FFS	Farmer Field School
FRA	Food Reserve Agency
GAP	Good Agricultural Practices
GRZ	Government of the Republic of Zambia
IFAD	International Fund for Agricultural Development
IITA	International Institute of Tropical Agriculture
MACO	Ministry of Agriculture and Cooperatives
MAFF	Ministry of Agriculture, Food & Fisheries
MoU	Memorandum of Understanding
MT	Metric tonnes
NDP	National Development Plan
NEPAD	New Partnership for Africa's Development
NFNC	National Food and Nutrition Commission
NGO	Non Governmental Organization
PAM	Programme Against Malnutrition
PRSP	Poverty Reduction Strategy Programme
SAP	Structural Adjustment Programme
SCCI	Seed Control and Certification Institute
SHEMP	Smallholder Enterprise and Marketing Project
TOR	Terms of Reference
USAID	United States Agency for International Development
VAT	Value Added Tax
WB	World Bank
WTO	World Trade Organisation
VAC	Vulnerability Assessment Committee
ZAHVAC	Zambia Association for High Value Crops
ZATAC	Zambia Agribusiness Technical Assistance Centre
ZEGA	Zambia Export Growers Association
ZK	Zambia Kwacha
ZNFU	Zambia National Farmers Union

## **Acknowledgement**

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The author wishes to extend his gratitude to the FAO Representation Officer, especially Mr. Dong Qingsong, FAO Representative and Mr. Lewis Bangwe, Assistant FAO Representative for their support during the cause of implementing this study.

The funding of the study under the TCP Facility for FAOR is also acknowledged and also the technical input of Dr. Lutaladio NeBambi, FAO Technical Officer who reviewed and cleared the report. The Ministry of Agriculture and Cooperatives provided some vital information. The consumers and traders in Lusaka are acknowledged for their patience in supplying vital information on their business practices.

**Munguzwe Hichaambwa**  
Consultant

# 1.0 INTRODUCTION

## 1.1 Some Basic Facts

### 1.1.1 Companion Staple to Maize

Maize has been the recognised staple food for most Zambians in rural and urban areas. Food security policies and strategies in Zambia have therefore, remained highly biased towards maize. The danger of over-dependence on maize is that its production is expensive and reliance on it alone narrows the food base, and also makes the national food security system vulnerable to droughts. Maize needs a companion staple and at the moment, the only cost-effective candidate is cassava.

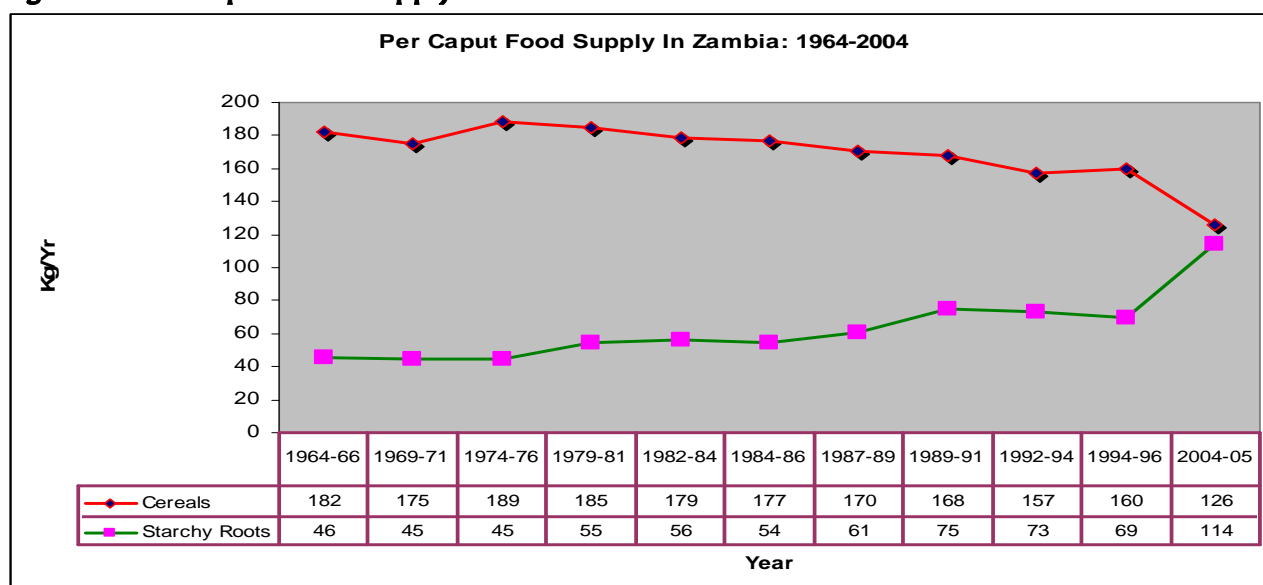
Experience in Asia, the Pacific, Latin America, the Caribbean, Central and Western Africa as well as other tropical countries show that when properly promoted and its preparation improved, cassava can be a reliable staple food.

In Congo D.R., cassava represents 70% of people's daily calorie intake

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In Zambia, trends show a declining pattern of cereal (maize, rice, wheat and sorghum/millet) production per capita in recent years (Figure 1). In contrast, production of starchy (sweet potato and cassava) roots production has been rising, despite its statistics remaining difficult to collect.

**Figure 1: Per Caput Food Supply in Zambia: 1964-2004**



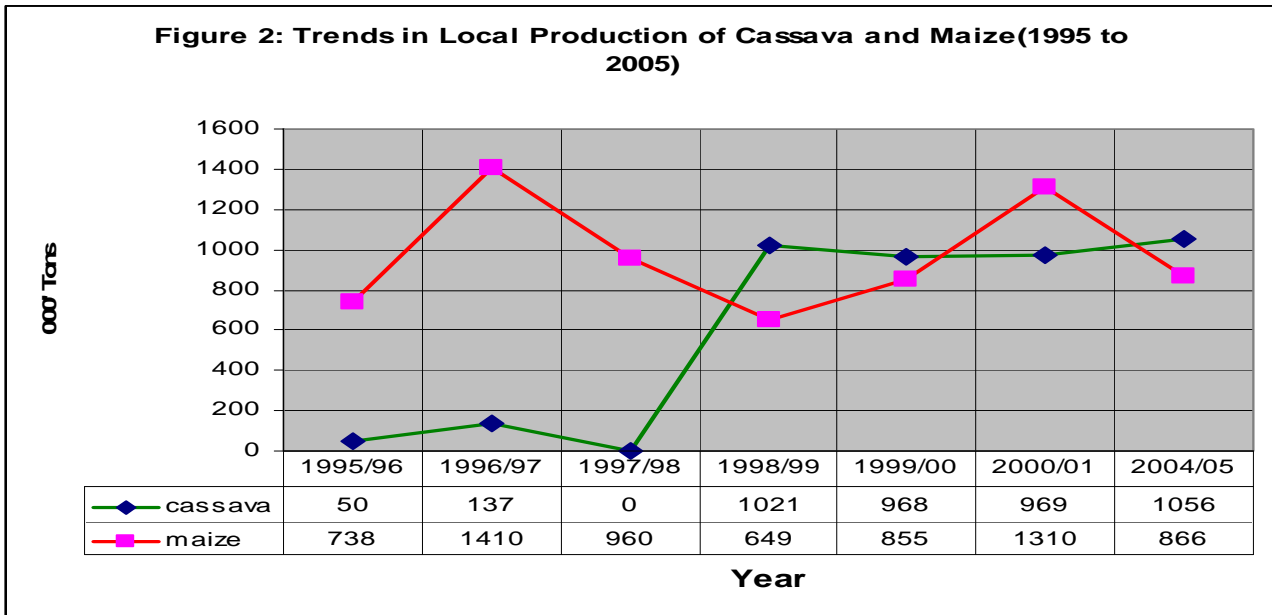
Source: FAO Food Balance Sheet 1994-96

This finding is collaborated by Jayne, T.S. et,al (2005) who observed that “gradually shrinking landholding sizes over the past decade have led to shifts in cultivation towards crops that provide greater calorific value per unit of land such as cassava and higher value crops ,..... cassava and sweet potato now account for about half of the value of maize production in Zambia”.

### 1.1.2 Have we reached the Cross Roads?

Indeed it would seem like so from both Figures 1 and 2. In 1995-96, maize production contributed 738,000MT to the Food Balance Sheet compared to 50,000MT for cassava. Within a decade, by 2004/5, maize contribution declined to 866,187MT compared to an increase for cassava 1,056,000MT. Much of the changes in cassava figures can be attributed to improved statistics as much as to increases in production.

**Figure 2: Trends in Local Production of cassava and Maize (1995-2005)**



Source: MACO Agricultural Statistics Bulletin, 1999/2000

Crop forecasting Surveys in 2004/2005 showed that cassava availability had improved by 18% on the previous year's availability compared to maize availability that declined by 29% during the same agricultural Season. A CSO supplementary survey (2003/04) however, highlighted the low commercialisation of cassava. About 40% of Zambians were growing cassava compared to 80% maize. But only 11% were selling cassava compared to 28% for maize.

### 1.1.3 Why has Cassava gained in Importance?

30% of Zambians depend on cassava as staple food

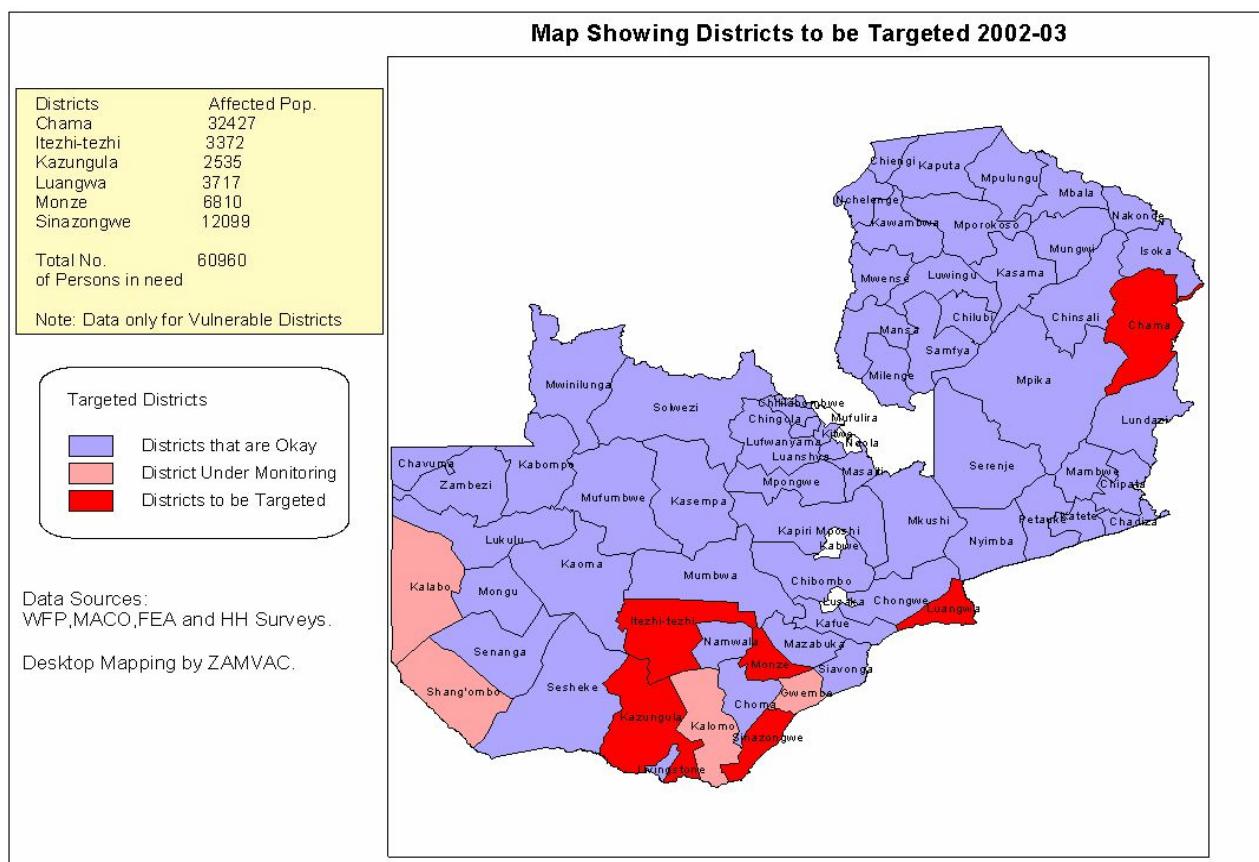
First of all, cassava has always been important in almost half of Zambia, with 30% of Zambians depending on it as staple food. Lack of official statistics has hidden its role in

food security. Simply by improving collection of production and yield statistics, Government has taken the first steps towards improving the profile and status of cassava in food security. FAO has been developing guidelines and methodology for collecting statistics on roots and tuber crops.

Secondly, insecurity related to maize production arising from liberalisation has also driven most farmers back to cassava. Consumer habits and rising cost of living in urban areas are also driving the change in favour of traditional foods. A prolonged and sustained increase in cassava production can only be achieved with better market opportunities created by increased demand in urban markets through domestic and industrial use.

Thirdly, cassava is a dependable staple in areas where it is grown. Cases of acute food insecurity even during drought years are rare in cassava growing areas of northern Zambia (Figure 3). In contrast, maize growing areas show a high sensitivity to drought and factor prices.

**Figure 3: Map showing Districts Requiring Food Assistance in 2002-03**



Source: VAC, 2003

### 1.1.4 Is Cassava an Inferior Food?

**Any food, including cereals, consumed on its own is inadequate for optimum human nutrition.**

It might seem so at face value. However, the basic rule of good nutrition is for a balanced diet. This is a combination of different food types that provide an optimum amount of required nutrients for body functions. Any food, including cereals, consumed on its own is inadequate for optimum human nutrition. Cassava is deficient in some nutrients but is quite rich in others especially energy (Table 1).

**Table 1. Nutrient Composition of cassava compared to other foods**

Food source	Water (%)	Protein (g)	Energy (Kcal)	Fats (g)
Maize	11.6	9.4	357	4.2
Cassava tuber	62	1.2	149	0.2
Cassava flour	12	1.5	342	0
Rice	118	6.4	366	0.8
Potatoes	77.7	1.7	82	0.1
Rape	93	2.7	27	0
Cassava leaf	72.5	8.6	112.6	1.9

Source: MACO, 2000 and FAO, 2003

The fresh tuber is quite low in nutrients, but people don't consume cassava mostly as fresh tuber. Cassava flour is a cheap source of energy comparable to maize and rice since its production cost is lower. The cassava leaf is richer in protein and energy than rape, a commonly accepted urban vegetable.

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Cassava indeed has some toxic cynogenic glucoside substances but these can be removed through careful processing and use of sweet varieties.

Even though cassava is slowly penetrating the urban culinary table, there is a widespread perception that it is a poor man's food, and given a choice, most people seem to prefer cereals like maize and rice. This poses policy challenges as richer policy making elites ignore cassava.

## 1.2 Background to this Report

Zambia is in the process of preparing a Fifth National Development Plan (NDP, 2006-2011) under which achievement of sustained agricultural enterprise diversification for food security is expected to remain a key objective as indicated in the National Agriculture Policy.

As part of its support to this process and in preparation for other upcoming projects related to cassava promotion, FAO and MACO in Zambia commissioned this small study to discern the indicative patterns and trends in domestic and industrial consumption of cassava as a basis for designing a promotional strategy.

Many studies have shown that poverty is widespread and well entrenched in Zambia and is considerably higher in rural than in urban areas. Improvements in the livelihoods of smallholder farmers have been uneven due to lack of profitable marketing opportunities for their surplus produce, and farmer's inability to develop marketing practices to take advantage of the opportunities for diversified and value-added production.

In the late 1980s to mid-1990s, Zambia implemented Structural Adjustment Programmes (SAPs) to restructure public sector services and liberalise support services. Private firms were expected to expand their investments in research and extension, input supply, product

assembly, processing and export. This market liberalization has affected most smallholder farmers who depended on access to high cost inputs and output markets to produce maize. This pattern has been worsened by frequent droughts in the traditional maize growing areas of Zambia.

The combined affect of these trends has been a significant shift in the cropping patterns amongst smallholder farmers, with the predominant trend being a shift away from maize towards alternative food staples. Smallholder farmers have been diversifying into less risky, low cost and drought tolerant food crops such as cassava, sweet potato, sorghum and millet. As seen above, there have been significant increases in the area planted under root and tuber crops.

Smallholder farmers have been diversifying into less risky, low cost and drought tolerant food crops such as cassava, sweet potato, sorghum and millet.

### 1.2.1 Policy Framework

Four major policy instruments have guided development of the agriculture sector since 2000. The Poverty Reduction Strategy Paper (PRSP) targeted reducing poverty by 50% by the end of 2004. The Agriculture Commercialization Programme (ACP) as the main agricultural component of the PRSP, underscored the need to promote a competitive private sector driven agricultural marketing, trade and agri-business system to develop agriculture in Zambia. The National Agriculture and Cooperatives Policy was expected to remove uncertainties related to the recent re-introduction of subsidies on agro-inputs and price supports, mainly for maize. All these policy instruments therefore seem to favour the growth in non-maize crop enterprises like cassava.

There are many policy constraints related to root and tuber promotion and cassava in particular:

1. Root and Tuber production is least supported by extension because of its subsistent nature.
2. Processing, storage and marketing facilities are very poorly organised
3. Maize subsidies continue to be detrimental to the growth of cassava. High dependence on cereals and consumer attitudes tend to favour cereals. Trade is dwarfed due to poorly developed market demand by the urban class.
4. Even international food relief agencies and donors promote cereals at the expense of cassava when assisting food deficit communities and vulnerable households.
5. National research and development is biased towards cereals and pays only rudimentary attention to cassava

## 1.2.2 Objectives of the Study

The main objective of the study was to reveal some indicative patterns and trends in cassava consumption in urban Lusaka as a basis for designing a sustainable promotional campaign for wider use of cassava.

## 1.2.3 Methods Used

The study adopted a simple random sample to interview **88** consumers in three locations of Lusaka disaggregated by density status. Thirty households each from Avondale, Kamwala and Mtendere, representing a low, medium and high density compound were interviewed. A total of **88** households were covered in the interviews and their responses analysed. In addition, the research team interviewed a range of other players including traders, marketeers, restaurant owners, retail shop managers, NGOs and development agencies thought to deal in cassava and using a checklist.

**Table 2: Sample size**

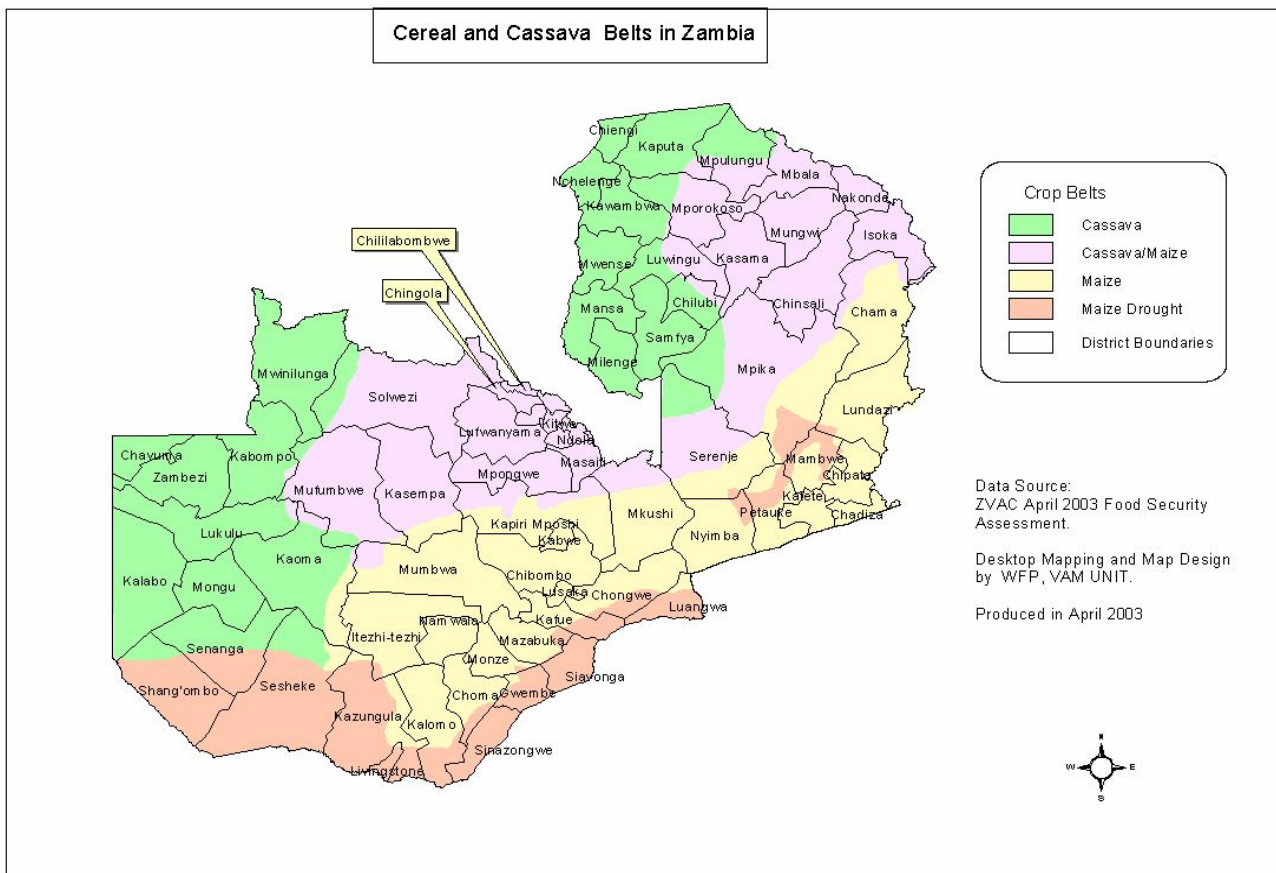
Residential Area	Percent Respondents by Gender of Household Head		Total Count
	Female	Male	
Avondale	14.3	85.7	28
New Kamwala	43.3	56.7	30
Mtendere	20.0	80.0	30
<b>Total Count</b>	<b>23</b>	<b>65</b>	<b>88</b>

## 2.0 CHARACTERISTICS OF CASSAVA

### 2.1 Origin and Distribution

Cassava (*Manihot esculentus*; syn. *utilissima* Pohl) is a species belonging to the family Euphorbiaceae and is of Amazonian (North-East Brazil) origin in South American. It was introduced to Africa and Zambia around 1700 by Portuguese traders and explorers. Over 200million people in Africa now depend on cassava.

Figure 4: Cereal and Cassava Belts in Zambia



Source: WFP VAC Unit

Cassava production has also moved slowly but steadily moved to Lusaka, Eastern and Southern provinces as a result of promotion work of Government, NGOs and donor partners. For instance, Mumbwa and Rufunsa supply most of the sweet variety of cassava commonly consumed as raw or boiled tuber in Lusaka.

In Zambia, since then, cassava has taken root in many areas, especially the high and medium rainfall northern and north-western areas. As early as 1932, Trapnell and Clothier (1996), indicated that cassava was well known in Northern, Luapula, North-Western, Copperbelt, Eastern, Western, Central and Southern parts of Zambia. Table 3 provides testimony to this and shows the

range of local names by which cassava was known in Zambia. In recent years, production has been concentrated in Northern, Luapula and North-Western. Some significant populations in Western, Central and Copperbelt provinces have also started producing cassava. Cassava production has also moved slowly but steadily moved to Lusaka, Eastern and Southern provinces as a result of promotion work of Government, NGOs and donor partners. For instance, Mumbwa and Rufunsa supply most of the sweet variety of cassava commonly consumed as raw or boiled tuber in Lusaka.

**Table 3. Local names of Cassava in Zambia**

Tribe/Local name	Province
Lala (Tute)	Central
Lamba, Lima (Tute)	Copperbelt
Kunda (Tute)	Eastern
Tumbuka (Mayawo)	Eastern
Senga, (Vikau, Muhogo, Chinangwa, Vinangwa)	Eastern
Chewa (Vikau, Muhogo, Chinangwa, Vinangwa)	Eastern
Ngoni (Nyumbula)	Eastern
Tabwa (Kalundwe, Tute)	Luapula
Chishinga (Kalundwe, Tute)	Luapula
Bemba (Kalundwe, Tute)	Northern
Bisa (Kalundwe, Tute)	Northern
Mambwe (Kalya)	Northern
Namwanga (Mayawo)	Northern
Kaonde (Makamba)	North-Western
Lunda, Ndembo (Makamba)	North-Western
Luvale (Mwanja, Lupa)	North-Western
Ila, Tonga (Makamba, Mwanja)	Southern
Nkoya (Makamba)	Western
Lozi, Kololo, Luyi (Mwanja)	Western
Source: C.G. Trapnell and J.N. Clothier (Ecological Surveys, 1932-42)	

Trade in cassava has happened in late 1800 and early 1900 in northern Zambia. Around the 1930s the flow of cassava flour from Luapula into the Copperbelt increased. This trade has continued to day and increasing even more (Trapnell and Clothier, 1996).

## 2.2 Botany and Agronomy

### 2.2.1 Climatic and Soil Requirements

Cassava grows best in lowland tropics with warm, moist climate and mean temperature range of 25-29C. Cassava

performs optimally under 1000-1500mm rainfall conditions but is also well adapted under semi-arid conditions up to 500mm rainfall annually. The best soil for cassava is light, sandy loam of medium fertility and good drainage.

Cassava takes 18-24 months to mature and yields in Zambia average 8-10tons/ha. This is low in relation to research station yield of over 30tons/ha. Cassava production is appreciated by subsistence farmers in most parts of Zambia because it:

Cassava takes 18-24 months to mature and yields in Zambia average 8-10tons/ha. This is low in relation to research station yield of over 30tons/ha.

1. Requires minimum fertilizer, pesticides and rain water. Cassava can grow on a wide range of soil conditions, including acidic as well as sandy soils
2. Yields reasonably well under marginal and poor soil conditions.
3. Has low labour requirements compared to other crops.
4. Can be planted and harvested over a wide range of time, spreading the farm labour.
5. Stores well underground until required for harvest.
6. Produces more energy per unit area and labour compared to cereals
7. Can be harvested and consumed any time of the year.
8. It can be grown under mixed and intercrop systems.
9. Can be processed into many domestic and industrial by-products (flour, pellets, feed, bakery and starch)
10. All the plant parts are useful for utilisation and consumption (roots, stems, leaves)

11. Resistant to many pests and diseases. Cassava mosaic virus and mealy bug have been common problems in Zambia

Cassava is therefore a crop of the higher rainfall zones even though it can grow almost anywhere in Zambia. Post-harvest survey (1999/2000) indicated that 61% of gross revenue from roots and tubers (cassava and sweet potatoes) came from the highest rainfall region followed by 16% in the higher rainfall, 12% in lower rainfall and 11% in the least rainfall zone.

### 2.2.2 Nutritional Characteristics

The bitter cassava contains high levels of hydrocyanic acids and cyanogenic glucosides which are poisonous and can cause iodine deficiency, malnutrition and paralysis of lower limbs, unless soaked and processed before consumption.

Cassava's main weakness is however, its anti-nutritional characteristics if not handled well. There are two types of cassava that can be differentiated; bitter and sweet varieties. The bitter cassava contains high levels of hydrocyanic acids and cyanogenic

glucosides which are poisonous and can cause iodine deficiency, malnutrition and paralysis of lower limbs, unless soaked and processed before consumption. The development of toxicity is influenced by variety as well as soil and seasonal water conditions. Cassava is also low in protein.

The main and commonest bitter variety grown in Zambia is *Nalumino*. Common sweet varieties are *Kapunba*, *Nakamoyo* and *Bangweulu*. there are a whole range of other bitter and sweet varieties known by local names.

Table 1 however, indicated the main nutrients in cassava and its main by-product flour.

Cassava flour is quite rich in crude fibre, calcium, iron, thiamine and nicotinic acid. Compared to other popular green leafy vegetables, cassava leaves are especially rich in protein, fats, calcium, phosphorus, iron, vitamin A, B<sub>1</sub>, B<sub>2</sub> and C. In order to benefit from high energy and carbohydrates from cassava-based diets, it should be consumed in combination with other foods rich in protein, minerals and vitamins such as maize, meats, legumes and green leafy vegetables.

Cassava flour is quite rich in crude fibre, calcium, iron, thiamine and nicotinic acid. Compared to other popular green leafy vegetables, cassava leaves are especially rich in protein, fats, calcium, phosphorus, iron, vitamin A, B<sub>1</sub>, B<sub>2</sub> and C.

Cassava should also be carefully and quickly processed soon after harvest to reduce water content, reduce levels of toxins, stabilise its by-products, improve taste, nutritional content and physical appeal to consumers. Cassava tuber can be processed using both traditional and improved methods. The main products from these processes include cassava chips, flour, starch, tapioca, gari, farinha, fufu and pellets. The chips and starch are raw materials for industrial use. Various publications, including (PAM, 2000) provide details on processing of

cassava. Cassava tuber, leaves, branches and peels provide good meal for livestock, especially cattle, sheep, goats and pigs.

## 2.3 Global Uses and Utilisation of Cassava

### 2.3.1 Industrial and Culinary Utilisation

Cassava production mainly occurs in West Africa and Congo Basin, Tropical South America and South-East Asia. Nigeria, Brazil, Thailand, Zaire and Indonesia are the leading producers. Because of the need to detoxify it, cassava is the most frequently processed of major food crops and processed forms are diverse (Table 4). Processing is also driven by the need to improve its socio-economic among urban consumers, as well as to make it less bulky, more transportable, more storable and easier to prepare.

**The challenge is to produce a range of culinary forms that would fit into the fast food delivery system which modern urbanites prefer to subsist on.**

Gari (West Africa) and Farinha (Brazil) are examples of processed and acceptable products that fit well with urban demand. The challenge is to produce a range of culinary forms that would fit into the fast food delivery system which modern urbanites prefer to subsist on.

**Table 4 Main global utilisation of cassava**

Product	Process	Consumer	Conditions
Fresh Tuber	Raw as salad or snack Boiled or roasted Roasted chips Boiled and pasted – Fufu Peels	Humans	Sweet varieties
		Livestock	Supplements
Meal and Flour	Gari Farinha Retted cassava Nshima Refined Flour for Baking	Human	Processed
Chips and Pellets and starch	Industrial raw materials Glucose Grocery tapioca Textiles Confectionery Glues	Industrial Livestock	
Leaves	Pondu Katapa	Human Livestock	Processed

Opportunities to diversify into cassava exist through promoting better varieties of cassava suited for:

- (1) Animal feeds (silage) which require ‘bitter’ varieties with large biomass production,
- (2) Bakery products that target varieties with high flour or dry matter content,

- (3) Starch industry (including industrial glues) needs large tuber varieties with high carbohydrate content, and
- (4) Food staple there are 'sweet' varieties offering edible tops (protein) and good tuber yields (energy, b-carotene) of manageable size.

The Global Cassava market study (FAO/IFAD, 2004), concluded that domestic markets offered greatest opportunities for business than export markets. The market for cassava as a food provides greatest potential with import substitution for wheat products creating additional cassava demand of over 10% compared to 1995 production levels in 48 of 64 countries studied by 2005.

**The growing urban market is a promising avenue for development of cassava industry**

For Zambia, the percent increase over 1995 production owing to urbanisation is estimated at 13%. The growing urban market is a promising avenue for development of cassava industry. This development is premised on market development and delivery of appropriate quality and price of the product to the consumer. Quality and standards will play a critical role.

In relation to industrial use, the study concludes that the low use of starch in some developing countries posed a limitation to development as technical and economic feasibility to establish local plants was low. A normal traditional starch plant would produce 400mt/year and if Zambia's demand is above this, then it can consider establishing a cassava-based starch plant. The plants would need to raise the quality of the product.

Domestic use of cassava as an animal feed is probably the least developed of domestic markets. But the decline in maize production and increasing imports of the same poses some opportunities. It is technically possible to replace much of the imported maize by cassava.

### 2.3.2 International Trade

Cassava is the most traded on the international market of all tropical tubers, with over 31million tonnes exported in 1984 and over two-thirds of this coming from Thailand and the rest from China and Indonesia (FAO, 1994). Exports were mainly to Germany for stock feed. Increased population and growing urbanisation in developing countries require innovative moves towards diversifying the global diet to feed the people. It is projected that by 2020, cassava will be increasingly used in processed form for food, feed and starch derivatives. Biotechnology research may also widen the non-food and non-feed uses of cassava. This points to promising business opportunities for commercialisation of cassava as human food, fodder and industrial raw materials in domestic and export markets. Zambia with all its natural resource endowments cannot afford to be left out of this revolution (FAO&IFAD, 2004).

**It is projected that by 2020, cassava will be increasingly used in processed form for food, feed and starch derivatives.**

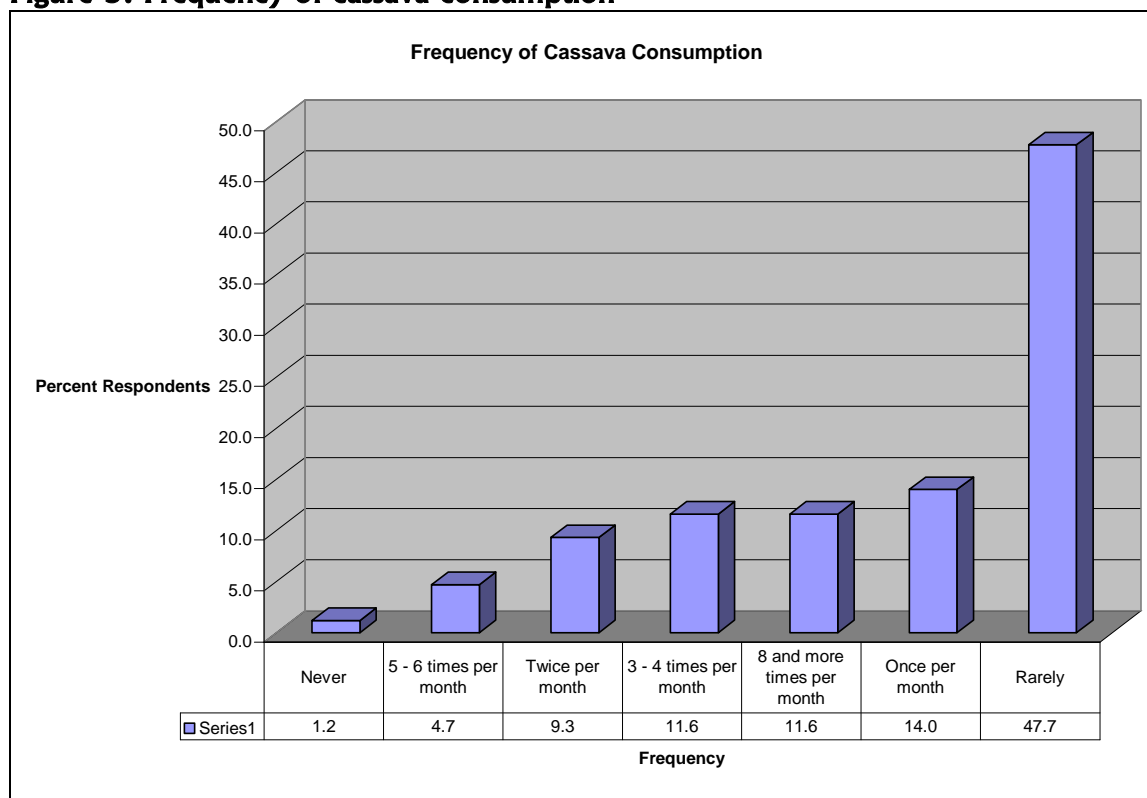
## 3.0 FINDINGS: PATTERNS OF CONSUMPTION IN LUSAKA

### 3.1 Domestic Consumption of Cassava

#### 3.1.1 Was Cassava ever consumed?

About 97% of the Lusaka households interviewed reported having ever consumed cassava in one form or another. An earlier study by CLUSA (2003) in eight residential compounds of Lusaka indicated a lower figure of 63%. Cassava is slowly being accepted in Lusaka as an important food. The frequency of consumption, however, shed more light on the pattern of consumption. About half (47.7%) rarely consumed cassava. This shows that a potential demand of 50% of Lusaka residents consumer cassava at least once every month.

**Figure 5. Frequency of cassava consumption**

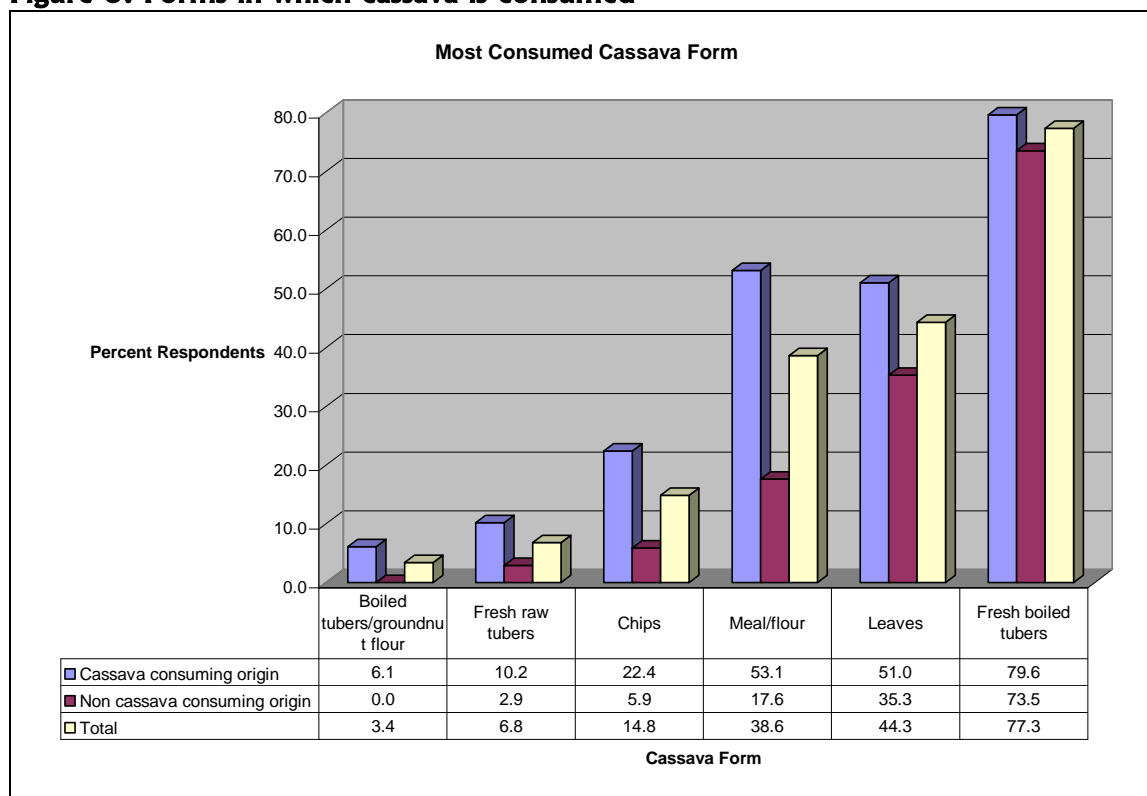


#### 3.1.2 Who consumes and in what forms?

The main forms in which it is consumed are cassava nshima (mostly mixed with maize meal), boiled tubers (from sweet varieties), cassava roasted chips, flour, cassava cake and cassava leaves. Figure 6 shows the main forms in which cassava is consumed in Lusaka.

As expected people originating from cassava production areas in the northern Zambia generally consumed more cassava than those from southern Zambia. However, the consumption of fresh boiled tubers was highest and almost the same in both groups (above 73%).

**Figure 6: Forms in which cassava is consumed**



The consumption of cassava leaves was also quite significant among southerners (35%). Almost half of northerners consumed cassava meal and leaves. These consumption patterns indicate that cassava can be promoted among southerners living in Lusaka.

Meal Type	Percent Respondents by Household Origin		Total
	Cassava Consuming	Non Cassava Consuming	
Breakfast	4.1	5.9	4.5
Lunch	42.9	5.9	28.4
Supper	59.2	26.5	44.3
Snack	71.4	79.4	73.9

General consumption patterns and forms indicate that cassava is mainly consumed in snack form. With fast food outlets increasing in Lusaka, this offers hope to diversify the use methods.

As a main meal people from the north consumed it more for supper (59%) and lunch (43%) compared to southerners whose significant consumption during main meals was mainly for supper (27%).

Source	Percent Respondents
Urban Market	71.8
Highways/roadsides	37.6
Village	11.8
Own production	5.9
Supermarket	2.4
Other	1.2

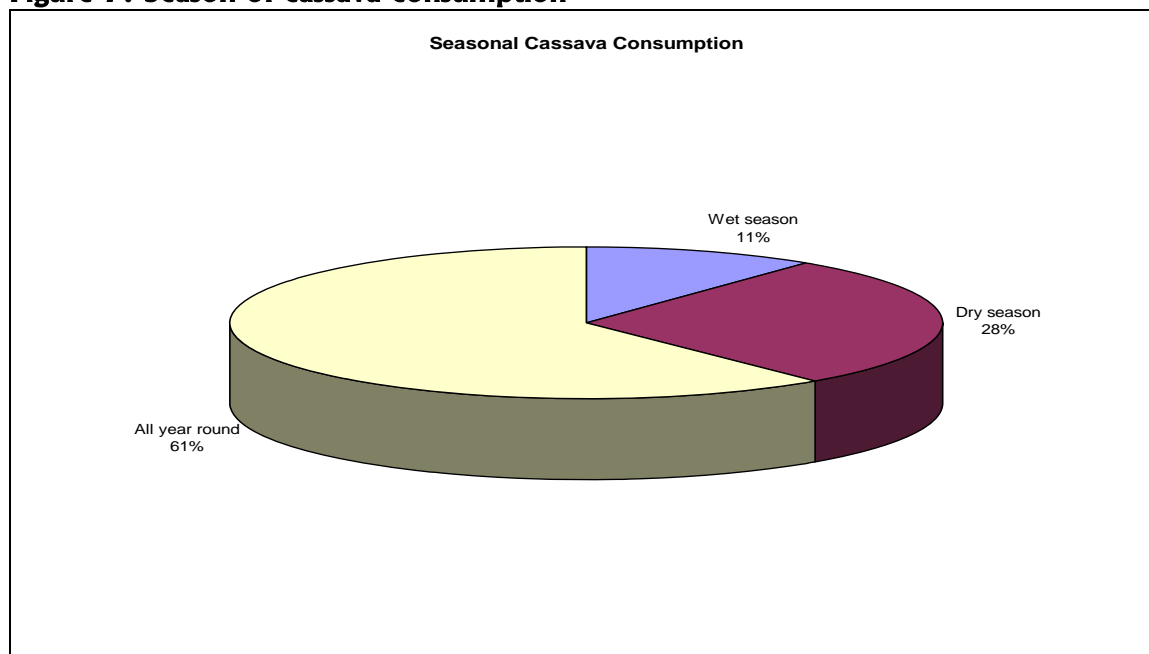
The main sources of cassava supplies for urban consumers are urban markets (72%), roadside markets (38%) and the village (12%). This indicates a linkage with village flows as all these

sources are linked to the villages. Procurement of supplies from own production and supermarkets is low. With rising stockists among supermarkets, this may improved as a source. However, price differentials explain why urban markets are preferred. A kg of cassava flour for instance costs K1,000 on the market and about K1,500 in retail supermarkets.

### 3.1.3 Who consumes what amounts?

Perhaps the most significance of cassava as a food security crop is highlighted when the seasonality of its consumption is analysed. Just over 60% of cassava is consumed all year round. This shows that it is a potentially dependable food of all seasons.

**Figure 7. Season of cassava consumption**



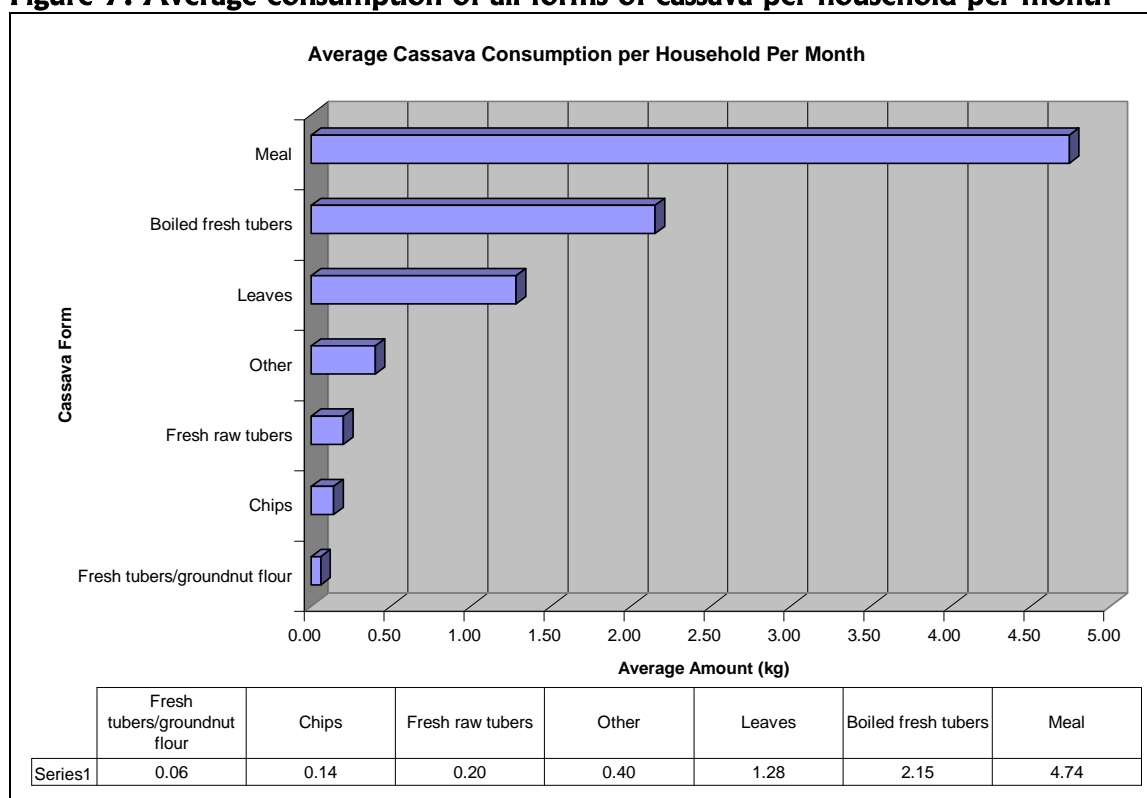
An average of 4.7kg per household per month of flour indicates a significant contribution of cassava to the urban diet in some households, considering that cassava is rarely consumed as a whole meal but combined with maize meal in approximate ratio of 5:1 for optimum taste and texture (Figure 7). An average family of six consumes about 50kg of maize meal per month. This works out to a ratio of about 10:1.

Boiled fresh tubers (2.15kg) and fresh leaves at 1.28kg per month are also quite high. These consumption quantities are consistent with a developing traditional snack food. With better processing and a diversity of improved snack meals, consumption is likely to increase.

The differences in consumption amounts between male and female headed households are not significant, but male households consumed slightly more than female households

Gender of hh head	Mean	N	Std. Deviation
Female	8.3696	23	11.40396
Male	9.2000	65	12.32876
<b>Total</b>	<b>8.9830</b>	<b>88</b>	<b>12.03478</b>

**Figure 7: Average consumption of all forms of cassava per household per month**



In terms of residential area which may also indirectly show wealth status (Table 8), people in high density areas (Mtendere) consumed more cassava per household per month (10.4kg) compared to relatively more affluent areas of Kamwala (9.1kg) and Avondale (7.2kg). This finding is consistent with widely held view that cassava is food for the poor. However, it is encouraging that even in affluent areas, cassava is being seen as a potential food.

**Table 8: Total Kg consumption by Residential area**

Residential area	Mean	N	Std. Deviation
Avondale	7.2500	28	9.75297
New Kamwala	9.1333	30	14.35386
Mtendere	10.4500	30	11.60882
<b>Total</b>	<b>8.9830</b>	<b>88</b>	<b>12.03478</b>

With the households, it may argued that elderly people with remnants of memories and contacts with rural life are more likely to consume cassava than the youth. This view is vindicated by the pattern of consumption statistics indicate in Table 9. It shows that households headed by people aged above 55 consumed 9.8 kg per month compared to 6.5 kg per month for households whose heads are aged below 30 years. The differences among household heads aged between 30 and 55 are not significant. Once more, it is encouraging to notice that young households are also able to buy and consume cassava meal.

**Table 9: Total Kg consumption by Age group**

Age group of hh head	Mean	N	Std. Deviation
< 30 Years	6.5000	16	10.72070
30 - 40 Years	8.2391	23	8.92248
41 - 55 Years	8.6774	31	10.91219
> 55 Years	9.7500	16	10.51190
<b>Total</b>	<b>8.3547</b>	<b>86</b>	<b>10.17201</b>

We noted earlier that people from the north of Zambia where cassava is traditionally grown consumed it more than people from southern areas. Table 10 underlines this point by showing that quantitatively, northerners consumed 12.6 kg per month compared to 4.7 kg per month for southerners. The table however, highlights that it is possible to convince people from non-cassava growing areas to eat more cassava.

Ethnicity of hh head	Mean	N	Std. Deviation
Cassava consuming areas	12.6087	46	14.47447
Non cassava consuming areas	4.6974	38	6.67442
Other	8.0000	4	8.52447
<b>Total</b>	<b>8.9830</b>	<b>88</b>	<b>12.03478</b>

Ethnicity and origin was also quite influential to cassava consumption even when applied to the kitchen manager (Table 11). Even with inter-marriages in Zambia, it still shows that where you come from has a significant influence on cassava consumption. Kitchen managers from cassava growing areas consumed 12.6kg per month compared to those from non-cassava growing areas (4.1 kg per month).

Ethnicity of kitchen person	Mean	N	Std. Deviation
Cassava consuming areas	12.5510	49	14.08983
Non cassava consuming areas	4.1912	34	6.47023
Other	6.6000	5	8.01873
<b>Total</b>	<b>8.9830</b>	<b>88</b>	<b>12.03478</b>

### 3.1.4 Exploring Income relations with Cassava Consumption

Having observed a close relationship between type of residential area and consumption of cassava, we now examine further the direct income has a bearing on consumption level. Table 12 shows that people in Avondale, a rich residential area spent the lowest on cassava but the middle class in Kamwala spent the highest (K23,050) per month followed by the less affluent in Mtendere (K19,233). Such patterns underline the importance of the middle class as a special target group in cassava promotion.

Residential area	Mean	N	Std. Deviation
Avondale	10178.57	28	13308.459
New Kamwala	23050.00	30	47755.908
Mtendere	19233.33	30	16868.014
<b>Total</b>	<b>17653.41</b>	<b>88</b>	<b>30641.546</b>

Table 13 further shows that cassava consumption is rising with income category until K5 million per annum (people most likely to live in affluent Avondale). The average expenditure on cassava was however highest for richer households showing that they buy from more classy places like supermarkets. Thereafter, consumption drops drastically indicating that the super rich are not likely to consumer much cassava. Lower income people may be willing to eat more cassava but are constrained by income level. The middle class are therefore, very important for expansion of cassava consumption in urban areas.

Income category	Mean	N	Std. Deviation
0 - 500,000	7.3158	38	12.95388
500,001 - 1,000,000	7.9524	21	9.09795
1,000,000 - 5,000,000	12.2609	23	12.12798
< 5,000,000	5.3333	3	4.50925
<b>Total</b>	<b>8.7412</b>	<b>85</b>	<b>11.72645</b>

Gender of hh head	Mean	N	Std. Deviation
Female	15217.39	23	17913.825
Male	18515.38	65	34104.615
<b>Total</b>	<b>17653.41</b>	<b>88</b>	<b>30641.546</b>

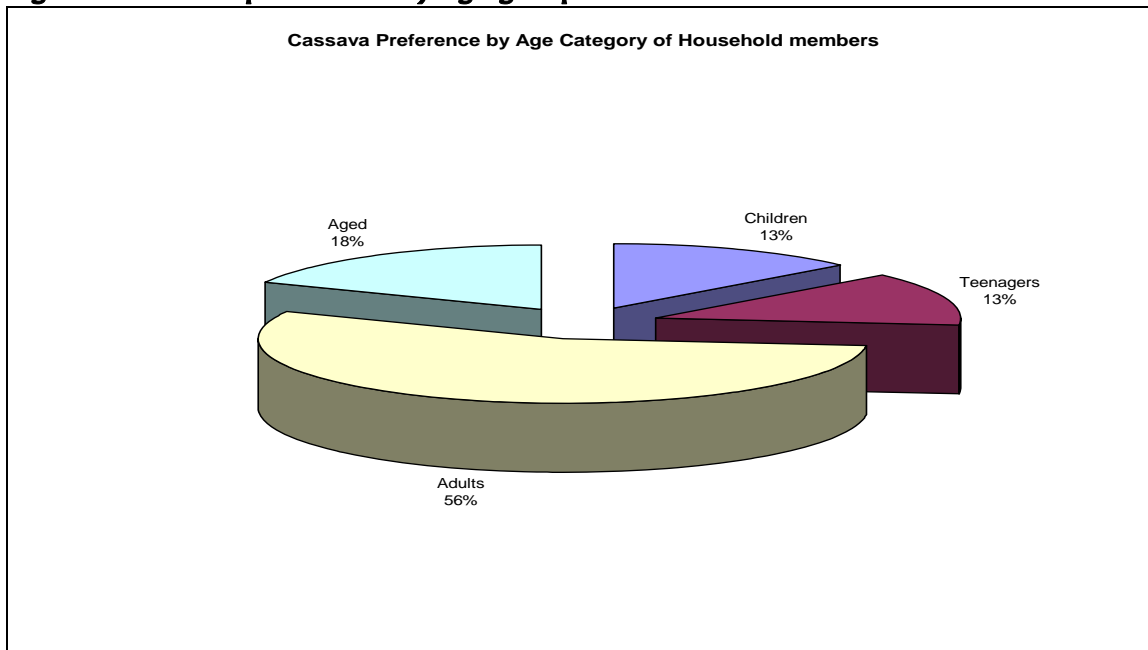
Male heads were slightly more involved in cassava consumption compared to females. Table 14 also indicates that male heads spent slightly more money (K18,515 per month) on cassava than female heads who spent K15,217 per month.

In relation to age group, the patterns clearly show that expenditure on cassava increases with age until you are 55 years old (Table 15). Even though the aged consumed more cassava, they spent less showing that they may be inclined to procure from less costly places like Soweto market than supermarkets.

Age group of hh head	Mean	N	Std. Deviation
< 30 Years	12375.00	16	16366.124
30 - 40 Years	13000.00	23	13977.254
41 - 55 Years	18225.81	31	19067.791
> 55 Years	14843.75	16	21923.898
<b>Total</b>	<b>15110.47</b>	<b>86</b>	<b>17808.524</b>

Preference indicators are consistent with age shows that elderly people have a higher preference for cassava than the youth (Figure 8)

**Figure 8 Cassava preference by age group of household members**



In relation to place of origin or ethnicity, people from cassava consuming areas spent more money (K22,782) than those from non-consuming areas (K10,000). This pattern was very similar to the origin of the kitchen manager's origin.

### 3.1.5 Constraints to Cassava Consumption

The main factors constraining increased cassava consumption in Lusaka from the consumer's point of view include lack of interest (51%), inadequate knowledge and low regard (31%), poor availability (28%) and high cost (18%). Other constraining factors are poor selling environment (6%) and processing difficulties (6%).

A similar CLUSA (2003) study indicated the main reasons for not using cassava as non-availability (48%), lack of interest or not used to it (18%), don't know how to prepare it (26%) and do not like taste (8%).

Availability was more constraining in low density residential areas (42% compared to 20% in medium and high density residential areas). This is understandable as most supermarkets are just picking up the practice of stocking cassava products.

As expected, lack of interest was more pronounced in households with non cassava consuming origins, 63.2% compared to 41.3%. This applied to inadequate knowledge which was more for households with non cassava consuming origins (38.2% compared to 24.5% for cassava consuming areas.

Given the low levels of supplies in Lusaka, it is understandable that the unit price of cassava flour is higher now than even maize but this is likely to be reversed as more farmers supply the market.

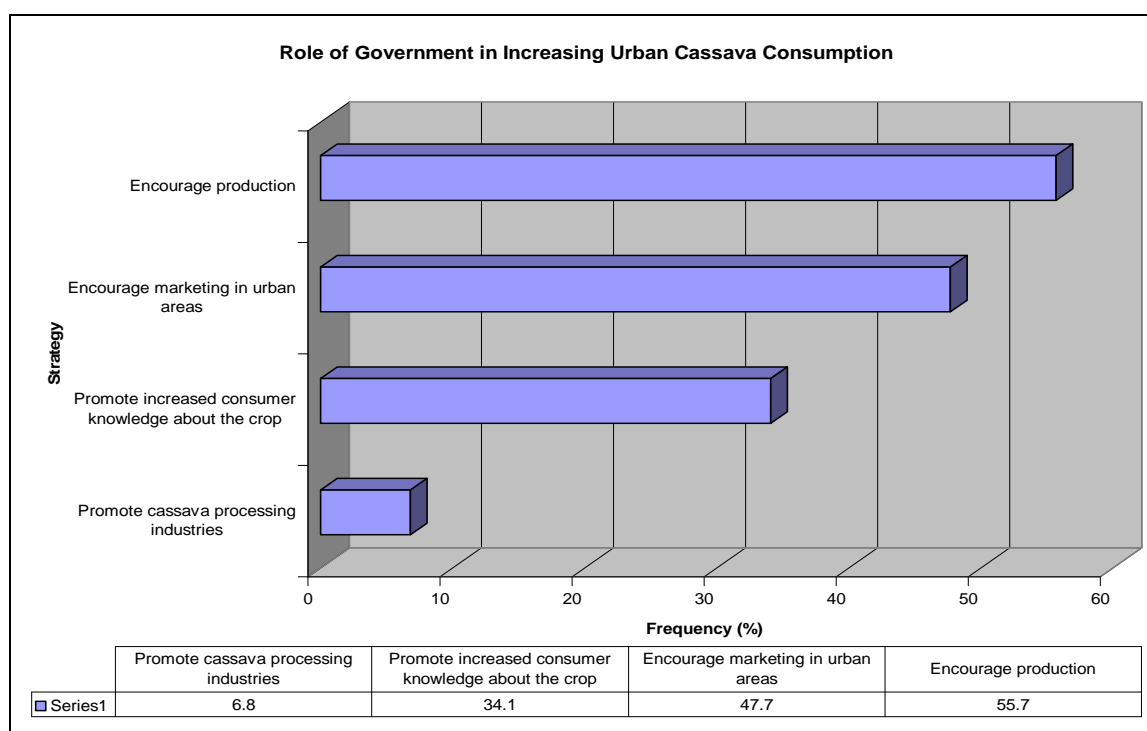
### **3.1.6 Factors in increased Cassava Consumption**

Most consumers were optimistic that cassava consumption can increase if there was increased efforts to sensitize urban people about the nutritive value of cassava (44%), coupled with increased supply (40%). It was mentioned repeatedly that the rising cost of maize meal may drive more people towards diversifying their diet to cassava. The most preferred forms of cassava for future consumption are flour meal (64%) and boiled fresh tubers (49%). For understandable reasons, households with non cassava consuming origins prefer more boiled fresh tubers. Those from cassava consuming origins prefer more of other products.

### **3.1.7 Government Role in increased Cassava Consumption**

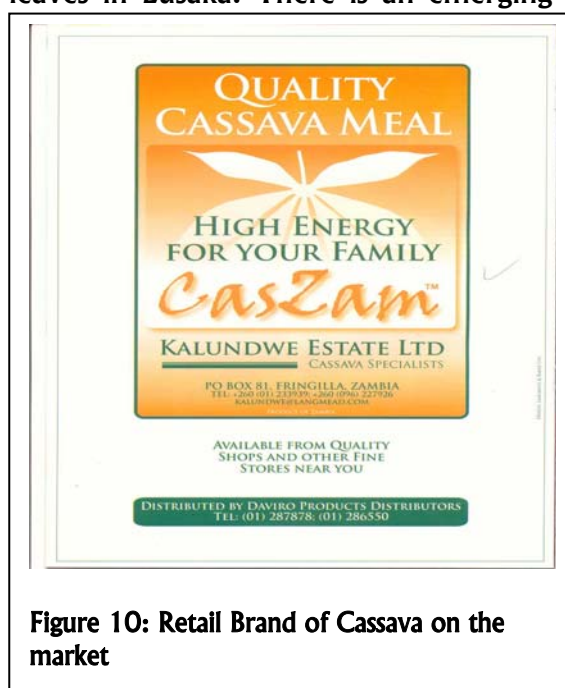
It would seem like inadequate supplies that are driving cassava prices upwards are seen as an area of intervention for government (Figure 9). Consumers feel that if the market is flooded with increased production, prices will fall and more people would substitute maize. A twin strategy is for Government to support marketing of cassava in urban areas, coupled with a high level campaign to increase consumer knowledge of the benefits of cassava.

**Figure 9 Government role in increasing cassava consumption**



### **3.2 Retailing and Trading for Cassava**

A substantial proportion of major supermarkets and retail shops now stock cassava flour and leaves in Lusaka. There is an emerging cadre of processors ordering cassava chips from the north and grinding to package flour for sale to retail shops.



**Figure 10: Retail Brand of Cassava on the market**

The processor’s main sources are the northern and western parts of Zambia. The technology used for processing is small plants and processing equipment. The packaging and branding is increasingly becoming professional and attractive (Figure 10).

Most retailers think trade in cassava products is on a booming and thriving pathway with increased turn-over in cassava flour sales. One of them *Chunno Agri-Group Ltd* for instance has a medium sized plant in the Show Ground premises where high quality and well packaged cassava foodstuffs such as garri and cassava flour are manufactured.

Chunno plans to train 1000 rural producers in Kaoma and expand plan capacity to produce 1000kg of Garri and 800kg of cassava per day.

According to the proprietor, Dr. Goody Eneke, “*Garri and Cassava are ideal foodstuffs that can be relied on in times of food crisis. Animal stock feeds could also be tapped along with other export oriented products. What is needed is technical training of farmers in cassava food processing, raising marketing skills, provision of technical know-how of equipment maintenance and sensitising consumers and policy makers on the usefulness of cassava.*”

Another prominent company is *Kalundwe Estate* in Central Province who manufacture well packaged cassava flour. There is also *Namando Investments, Chukwuma Ltd and Peco Ltd* that produces high quality cassava flour. Peco Ltd makes biscuits using 20% cassava flour.

The other value adding retailers are in the hospitality industry, including hotels and restaurants. Both cassava flour and cassava leaves are becoming popular among urban consumers. *Silva Catering, Matebeto* and others report good business and trade for cassava products and other traditional foods. People have realised the value of going back to the roots.

### 3.2.1 Attributes of Retailing

Table 16 indicates some of the attributes of the retail business for cassava in Lusaka. All indications are that the business is just developing and no one has confidence enough to conduct it as a sole business enterprise.

Table 16: Checklist of Cassava Processors/Stockists

Attribute	Puliandale Farms	Marriot Take-Away	Nairs Supermarket	Ginoka Fisheries
Contact Person	Ian Shula	Tryness Mutale	Mr. Naik	Phine Sichilenje
Phone	095-881465	097-634229	01-238392	097-690492
Category of institution	Miller	Restaurant	Supermarket	Fish Retailers
Core Business	Farming\Agro-Processing	Food and bakers	Groceries	Fish trade
Cassava product sold	Flour	Baked and fried	Flour	Flour
Quantity/Value per year	not sure	not sure	sells K2000 per 2kg packs, sold 50 packs this year	K8.7 million
Product liked by customers	Yes	Yes	Yes	Yes
Source of cassava	Luapula and Northern provinces	Zubek Wholesalers	Puliandale Farms	Brunos Millers
How to improve cassava appeal	Processing	Delicious products	Create consumer awareness about goodness of cassava	Processing Reduce dust Improve color Hygiene
Assessment of current and future demand	Increasing	Currently low but will increase	Not profitable now but has potential	Increasing
How can GRZ promote cassava consumption	Processing equipment Outgrowers /Marketing	Production Processing Milling	TV and Radio programs to consumers	Standards and hygiene Support production
Source: Cassava consumption and marketing survey, 2005				

The most common product sold is cassava flour, again highlighting the low level of diversity of products. But comforting is the diversity of dealers in cassava, including supermarkets, bakers and restaurants. It was also reported that cassava flour is liked by customers and is becoming popular. It would seem like the market value chain is still developing and is still in a diffuse stage. The future of cassava commercialisation lies in improved processing and diversifying preparation methods to appeal to trendy urban consumers.

### 3.2.2 Views of Street Traders

Table 17 summarises the main findings of the street trader interviews. As can be expected and due to high insecurity and risk, street traders were not very forthcoming in responding to the survey. Some were also wary of competition and trade secrets to keep away competitors in the business. Information on volume of sales and profit was especially sensitive in view of competition. One woman yelled angrily, *“You should not ask me such a question!, Do you want to promote more cassava to supply at low prices? You should think of poor people as well and don’t finish our market here. Just set your own business. Asking me how much I sell per day is fooling me but I can make you a fool also.”* However, we interpreted her response to mean low demand.

Street trading is scattered all over the Central Business District (CBD) but is spread out as far as the compound markets and outlying offices like Mulungushi House. Wherever moderate to large numbers of people converge, street traders also set up camp. The most popular is however, the main streets in Town Centre.

Many of the sellers are originated from northern parts of Zambia that are cassava growing. This may be understandable for connections in terms of eating and market and supply linkages and contacts. The most common product on the market are fresh tubers (sweet varieties), boiled tubers, dry chips and flour. Some old women buy dry chips and roast them not far from supply points. Many of the sellers buy from Soweto Market Depot where farmers and large traders offload from far off areas.

The profile of buyers from street traders is not fixed, but these may include male adults mostly of all wealth classes(9), adults of both sexes (6), aged females for roasting and resell(3) and high class motorists(2). Generally, most sellers feel demand for cassava products is increasing but stiff competition among sellers is cutting into profitability. For urban consumers, this can only be good news.

The main hindrance factors to increased cassava consumption include lack of knowledge(8), dirty/unhygienic selling place(4), eating cassava lowers dignity(4)and perception that it is bitter (2). The issue of low supplies and high price was also mentioned (2) as a hindrance. Highlighting the point of low dignity, one female trader had this to say, *“Cassava should not be given to children because it hardens the stomach and causes indigestion and development of worms”*.

Many of the traders were quite clear on need to be done to commercialise cassava. More education campaigns(11), getting it appeal to children by mixing it with other foods(8), informing people who are unused about the nutritious aspects and preparations(7) and

promoting production and preparation in non-traditional areas(5) were common responses. This they felt would lead to flooding the market and reduction in consumer prices (3) and

**Table 17: Checklist of Cassava Traders**

Attribute	Answers	Comment
Location	City Market, Lumumba, Katunjila, Los Angeles, Soweto, ChaChaCha, Kulima Tower, Millennium	Trading points in central Business District
Place of origin of trader	Northern Zambia (14) Southern Zambia (5) Malawian (1)	Northern Zambia is cassava producing and consuming region
Type of cassava sold	Fresh tuber (6) Boiled tuber (5) Dry chips (5) Flour (4) Roasted(3)	
Sources of cassava supplies	Soweto Depot (17) Own farm in Luapula(2) Lufunsa(2) Mkushi(2) Kapiri(1) Mansa(1)	Soweto Depot is the main wholesale where farmers bring the supplies Mkushi, Rufunsa and Kapiri is mainly for fresh tubers
Main customers/buyers	Male adults mostly of all wealth classes(9) Adults of both sexes (6) Aged females for roasting and resell(3) High class motorists(2)	
Demand assessment and volume of sales	Increasing(13) Decreasing(7)	Buys 25kg at K50,000 and resells K55-100,000 per day Raw cassava sells fast among urban consumers who buy it for lunch and snacks
Hindrance factors to cassava demand	Not used/Lack of knowledge(8) Selling place is dirty /unhygienic(4) Eating cassava lower dignity(4) Perception that it is bitter (2) High price/ Few suppliers(2)	Cassava should not be given to children because it hardens the stomach and causes indigestion and development of worms
How to promote consumption in urban areas	Education campaign(11) Get children used to it through mixing with food(8) Inform about nutritious aspects and preparations(7) Promote production and preparation in non-traditional areas(5) Flood market to reduce price(3) Mix cassava meal with maize(2) Encourage millers to process(1)	
Source: Source: Cassava consumption and marketing survey, 2005		

### **3.3 Industrial Processing and Use of Cassava**

The main potential industrial users of cassava are starch, bakers, food processors and feed (millers). Little progress has been done to adopt and integrate cassava into industrial products in Zambia but potential exists. According to Dr. Eneke (personal communication), products like cassava bread, cassava-wheat bread, pies, sausage rolls, cocktail snacks, strips, cakes, cookies and biscuits are not yet fully exploited and integrated cassava. In 2002, Zambia spent about US\$13.5million to import products of milling industry, malt and starches (A-Z of

Business in Zambia (2005). With increased cassava processing and substitution, this money can be saved and benefit local producers. The main potential for industrial application from unprocessed products in Zambia, according to a study by the Smallholder Enterprise and Marketing Project (SHEMP, 2003) are:

- Chips and Cassava flour
- Garri, fufu, Tapioca, etc
- Beverages
- Charcoal/Briquettes
- Cassava-Maize blends
- Cassava-Wheat blends
- Silage
- Chips/pellets
- Compound feeds
- High Quality Cassava Flour (baking, adhesive, glue, sugar syrup, alcohol, etc)
- Starch (specialty foods, textiles, timber and wood processing industry, packaging companies)

Important companies in Zambia include Milling Companies, Zambezi Papermills, Unity Packages, Peco Ltd, Wood Processing Industry, Trishul Company Ltd, Monterey Printers and Biscuit manufacturers.

The main factors to consider in industrial use of cassava products include infrastructure, reliable supply of cassava, water supply, power supply and access to land for factories. Availability of skilled labour, drying facilities and market demand size are also important factors.

### **3.4 Cassava Promotion**

The Government through the Ministry of Agriculture and Cooperatives (MACO) and the National Food and Nutrition Commission (NFNC) has been willing to promote traditional foods as a way to implement its food diversification mandate. With FAO assistance in 2000, the two institutions conducted a baseline survey on consumption of traditional foods in urban towns of Ndola and Lusaka. Based on the results, they launched a promotional campaign that included production of Recipe Book on Traditional Foods (MAFF, 2000), a Food Fair at Pamodzi Hotel and campaign T-shirts.

As far back as 2003, a consortium of NGOs advocated the purchase and distribution of 5,000Mt of cassava as a complement to cereals under food relief programmes. Led by the Zambia Episcopal Conference (Catholic Commission for Development and Christian Council of Zambia) and the Programme Against Malnutrition (PAM), the consortium organised a meeting facilitated by the Agriculture Consultative Forum (ACF) and presented a proposal entitled, "*Cassava Mobilisation Project: Cassava an Alternative to Maize for Relief Food in Zambia*" (2002). This was meant to fill the 112,630MT food gap that arose from the rejection of Genetically Modified maize and production. They estimated cassava marketable surplus every year around 300,000Mt. Unfortunately, the proposal was caught up in the politics of GM maize and received a hostile reception from donors and development agencies.

PAM has played a critical role in cassava promotion through its Food Security Pack and the SHAPES project. They have distributed plant cuttings for planting in various drought-prone areas. They have published a booklet on use and utilisation of cassava. They have been engaged in creating awareness of the importance of cassava in high profile meetings at the Agricultural Consultative Forum (ACF) and Holiday Inn. PAM has sent its staff on study tours to West Africa and South America. They have even gone as far as designing a cassava initiative to substitute some maize and other imported food products in relief efforts.

PAM believes cassava deserves to be promoted because of its attributes such as its wide adaptability to different agro-ecological zones, drought tolerance, low input requirement, less labour demanding, higher yield per unit area and its ability to be stored for a long time. *“Cassava is a staple food for 30% of Zambians and the whole plant can be used for human and livestock consumption. It also has a wide range of potential industrial applications. Cassava is surely a food security crop for Zambia”*, highlights a brief from PAM. PAM has been working with bakeries to produce Composite Bread from cassava and wheat flour. They have also teamed up with other players to hold Food Fairs at which various cassava products are displayed for public view and sampling.

Chunno Agri-Group is not only a cassava product manufacturer/retailer but also an avid promoter and provider of extension services. They have trained farmers in Kaoma and Mumbwa on cassava processing and utilisation as well as packaging. They have established a centre in Kaoma for processing, advocacy and training. Chunno also manufactures small plants and machinery for cassava processing such as graters, presses and fermentation equipment.

The Food Reserve Agency (FRA), a public entity mandated to buy designated food staples for national reserves has paid attention to cassava and has been piloting purchases in Luapula province. Its main market is Congo Democratic Republic. This gesture has been very much appreciated by farmers.

Silva Catering is one among private sector players in the hospitality industry that is trying to convince urban consumers about the benefits of traditional foods, including cassava in a practical way. Silva Catering has organised food fairs and promoted traditional foods at every opportunity.

### **3.5 Challenges and Opportunities**

Based on the findings highlighted above, the challenges for cassava promotion are many and in the short term may sound insurmountable.

#### **3.5.1 Low Production and Productivity**

Production and supply to urban markets is constrained by lack of access to improved cassava and quality planting materials, resulting in low yield compared to genetic potential. The timely availability of large quantities of high quality planting material is a major factor in the

effort to commercialize and industrialize the cassava commodity. Despite the availability of high yielding and pest and disease resistant varieties (i.e., Bangweulu, Nalumino, Kapumba, Mweru, Chila, Tanganika, Kampolombo, etc.) in the country, many released varieties are yet to be multiplied on a large scale and made available to farmers.

### **3.5.2 Lack of Processing Technology**

In order to reduce the danger of loss due to rapid perishability of the fresh cassava roots, they need to be consumed or marketed soon after harvest or processed into "more stable" products on-farm. In order to remove odours, improve colour and appeal, good processing is key in cassava production and consumption. In order to reduce the level of cyanogenic substances, toxicity should be removed through processing and transformation of cassava into marketable and consumable products. There is need to supply efficient dryers, peeling machines and pelletisers.

### **3.5.3 Low Consumer Appeal due to Low diversity of uses in Zambia**

The Zambian market is dominated by semi-processed products of relatively low consumer appeal like fresh roots, dried roots, dried chips, cassava meal and fresh leaves. On the international market, especially in West Africa and South America, the diversity of cassava products is amazingly high and appealing. For cassava to become a cash crop for farmers, there is need to diversify the use of the crop as a basic raw material for industrial use. Potential for use in livestock feed industry (i.e., silage, chips and pellets, compound feeds), bakery and confectionery, textile, pharmaceutical, alcohol, adhesives, glues and beverages.

### **3.5.4 Low Political Will and Institutional Support**

Both government and development agencies are to blame for a lukewarm support to cassava. Despite acknowledging that poor rainfall had an insignificant effect on cassava production and that without a surplus of 324,834MT of cassava, our national Food Balance Sheet would have been in serious trouble in 2005, both the Crop Forecasting statement by the Ministry of Agriculture and Cooperatives and the Zambia Vulnerability Assessment Report (June 2005) failed to clearly articulate any recommendation on future plans to ensure that cassava continues to play this complementary and partnership role to maize in the food systems of Zambia. None of them say anything on the potential of cassava as a relief or staple food for famine hit areas. In the VAC, there is only a small reference to promoting cassava production through distribution of high yielding varieties.

## 4.0 PROMOTING COMMERCIALISATION OF CASSAVA

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### 4.1 Policy and Advocacy

#### 4.1.1. Improved Statistics and Market Information

1. Improved on cassava should be a starting point to appreciate its role in the food systems of Zambia. FAO has been developing and providing guidelines for collecting statistics on root and tuber crops. There is need for Zambia's statistical systems to build a capacity by linking in with other international institutions such as International Centre for Tropical Agriculture (CIAT), International Potato Centre (CIP) and International Institute of Tropical Agriculture (IITA) to improve the technical capacity for management of cassava production, processing and consumption.
2. It is important that functional and sustainable national cassava market information acquisition and dissemination systems, accessible to target small-scale producers, processors and retailers, and other entrepreneurs to enable them make timely decision on trade and investment is established.

#### 4.1.2 Political will

3. There is an urgent need to operationalise crop diversification is required involving the campaign to change attitudes. The Ministry of Agriculture and Cooperatives should work with Ministry of Health, Ministry of Community Development and Social Services and Ministry of Commerce and Industry to promote positive attributes of cassava.
4. The importance of promoting cassava as a poverty fighter across Africa has been highlighted (NEPAD, 2003) with the formation of a **Pan African Cassava Initiative**, whose strategy emphasizes better markets, better organization of producers, and better engagement of the private sector to boost investment in the marketing chain. A declaration of a **National Cassava Initiative** and according cassava, a **Food of National Importance** (staple) would attract the attention of consumers and producers. The initiative could have a **Cassava Development Fund** component to support product development.
5. Government needs to provide tax and investment incentives for industries that demonstrate adequate integration of cassava as raw material in their products.
6. Encourage all food relief agencies and institutional boarders (schools, hospitals, prisons, refugees) to use a proportion of cassava in diets.
7. Establish networks, partnerships, and cooperation among concerned stakeholders to strengthen the case for cassava.

### **4.1.3 Raising Public Profile of Cassava**

8. There is need to create and raise public and consumer awareness about the potential business opportunities that lie in cassava. This can be done through high profile campaign involving;
  - TV and Radio campaigns
  - Adverts: bill boards, T-shirts
  - Working with hospitality industry
  - Working with the retail sector on quality issues
  - Working with relief food suppliers
  - Working with boarding institutions (prisons, schools, hospitals, etc)
  - Food fairs to exhibit diversity of products
  - Training kitchen managers on diversity of recipes
  - Continue developing cassava-based recipes and balanced diets

### **4.2 Increasing Production and Productivity**

9. Improved varieties yielding up to 30ton/ha have been developed at IITA. Cassava yield in Zambia is about 7-10ton/ha. There is need to close this yield gap through yield-enhancing interventions.
10. Both in traditional and new areas, multiplication and distribution of healthy and good quality cuttings of high yielding and disease resistant cassava varieties to farmers is required.
11. Extension staff should train farmers on the need for improved management practices such as soil selection, timely planting, selecting healthy planting materials, irrigation and weeding.
12. Establish Farmers' Field Schools to train farmers groups and associations production, processing and product development.

### **4.3 Processing and Utilisation: Product Development**

13. Provide and support small-and-medium-scale processors and entrepreneurs to acquire processing equipment kits.
14. Train small-and-medium-scale processors and entrepreneurs agri-business skills, technical skills and utilization and processing technologies through improved linkages to national and international institutions.

15. Organise producers into groups to link them to agribusiness, agro-processors, entrepreneurs, credit institutions, input dealers and markets. Promote outgrower arrangements in cassava growing and processing.
16. Establish a support Fund to explore and develop more products by industry with particular attention to cassava mixing with wheat for confectionery products, cassava mixing with maize meal for nshima and porridge, cassava mixing with sorghum and maize for brewing, cassava mixing with cereals for livestock feed pellets, cassava as a base product to substitute for corn starch in pharmaceutical industry.

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