CONSUMER PERCEPTIONS AND DETERMINANTS OF DEMAND FOR
CASSAVA PRODUCTS IN LUSAKA DISTRICT

A Research Report Presented to the Department of Agricultural Economics and
Extension Studies of the University of Zambia

By

GRACE MBOMA

In Particular Fulfilment of the Requirements for the Degree of Bachelor of Agricultural
Sciences

© Grace Mboma, 2013
ACKNOWLEDGEMENTS

The preparation and development of this Project Report was quite challenging. Nevertheless, its completion was realized all because of the people who saw the importance of it and rendered unprecedented support. I therefore want to acknowledge the following parties:

My sincere gratitude goes to Mrs B.C. Mulenga, my supervisor for her tireless efforts in guiding me to come up with this document. Her efforts and patience enabled me to conclude the necessary and relevant elements of the report.

Furthermore, I would like to thank all Members of Staff in the Department of Agricultural Economics and Extension of the University of Zambia, for having assisted in one way or the other.

This report is dedicated to my Dad, Mum, the rest of the family and my friends for their support. Thank you very much.
ABSTRACT

Consumer Perceptions and Determinants of Demand for Cassava Products in Lusaka

Grace Mboma
University of Zambia, 2013

Supervisor: Mrs B.C.Mulenga

Cassava is an important crop in many parts of the country, with an area under cultivation estimated to be 47 per cent of that under maize. Upon introduction of various crop diversification projects, its production has been on the rise. Currently, most cassava grown in Zambia is used for household food security, although there are still opportunities for increased sales to consumers, particularly in urban areas.

With much of the focus being on increasing supply, a persistent challenge to the cassava industry has been little availability of knowledge on demand for the crop and its products. A study was carried out in Lusaka District, aimed at determining the factors affecting demand for cassava products and the role of consumer perceptions on demand.

The general objective of this study was to find out the perceptions of consumers towards cassava and the factors that affect their demand. The specific objectives were to identify the factors affecting quantity of cassava demanded by households, to describe the socio economic characteristics of cassava consumers and to assess the role of consumer perception on quantity of cassava demanded.

A structured questionnaire was the primary instrument used for data collection. SPSS was used to generate descriptives while a regression model was run in STATA to determine which factors were significant. The value of cassava expenditure per household was used as a proxy for quantity of cassava demanded. Based on the results of the regression, price of maize meal, consumer preference and price of cassava meal were found to be significant, with p values of 0.002, 0.037 and 0.002, respectively.

Recommendations that came out as a result of this research were that the government should embark on a series of promotion programs in order to raise awareness of cassava benefits. This can be done at household level, in schools and also hospitals. Markets for cassava could also be improved by minimising the transportation costs that exist between the production and consumption points. To make cassava attractive to more farmers, a similar program to that of the Farmer Input Support Program (FISP) can be introduced. Lastly, price policies can be put in place to avoid adverse fluctuations, especially if cassava is to serve as a food security crop.
TABLE OF CONTENTS

Acknowledgements.................................................................................................i

Abstract..................................................................................................................ii

Table of Contents...................................................................................................ii

List of Tables..........................................................................................................v

List of Abbreviations ...............................................................................................v

CHAPTER 1: INTRODUCTION ..................................................................................1

1.1 Background of the study ................................................................................1

1.2 Problem statement .........................................................................................4

1.3 Objectives .......................................................................................................5

1.3.1 General objective .....................................................................................5

1.3.2 Specific objectives: ...................................................................................5

1.4 Justification .....................................................................................................5

1.5 Hypotheses ......................................................................................................7

1.6 Outline of the study .......................................................................................7

CHAPTER 2: LITERATURE REVIEW .....................................................................8

2.1 Introduction .....................................................................................................8

2.2 Definition of key terms. ................................................................................8

2.2.1 Cassava products ...................................................................................8

2.2.2 Consumer perceptions: ..........................................................................8

2.2.3 Demand: ..................................................................................................8

2.3 Determinants of demand ..............................................................................8

2.4 Conceptual framework ..................................................................................11

CHAPTER 3: METHODOLOGY .............................................................................13

3.1 Introduction .....................................................................................................13

3.2. Sampling procedure ..................................................................................13

3.3 Data collection methods .............................................................................14

3.4 Data analysis ..................................................................................................14

3.5 Limitations of the study .............................................................................14

CHAPTER 4: STUDY FINDINGS AND DISCUSSION .........................................15

4.1 Introduction .....................................................................................................15

4.2 Demographic characteristics .......................................................................15
4.3 Consumer perceptions ........................................................................................................... 17
4.4 Regression results ............................................................................................................... 18
CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS ................................................. 22
  5.1 Introduction ......................................................................................................................... 22
  5.2 Conclusion .......................................................................................................................... 22
  5.3 Recommendations .............................................................................................................. 23
REFERENCES ........................................................................................................................... 24
APPENDICES: questionnaire .................................................................................................... 25
LIST OF TABLES

Table 1: Distribution of Households by Sex............................................................... 15
Table 2: Distribution of Households by Marital Status ........................................... 15
Table 3: Distribution of Households by Level of Education ..................................... 16
Table 4: Distribution of Households by Level of Income .......................................... 16
Table 5: Consumer Perceptions.................................................................................. 17
Table 6: Regression Output for Insignificant Variables.............................................. 19
Table 7: Regression Output for Significant Variables............................................... 20
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSO</td>
<td>Central Statistics Office</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agricultural Organisation</td>
</tr>
<tr>
<td>FISP</td>
<td>Farmer Input Support Programme</td>
</tr>
<tr>
<td>PAM</td>
<td>Program against Malnutrition</td>
</tr>
<tr>
<td>SHEMP</td>
<td>Smallholder Enterprise and Marketing Program</td>
</tr>
<tr>
<td>ZARI</td>
<td>Zambia Agriculture Research Institute</td>
</tr>
</tbody>
</table>
CHAPTER 1
INTRODUCTION

1.1 Background of the study

For many years, Maize has been the staple food for the people of Zambia. However, owing to the recent changes in climate and instability in food prices (e.g. maize meal prices), the government and other institutions have embarked on a series of crop diversification projects aimed at promoting drought tolerant crops that can serve as complements or as substitutes in cases of low maize yields.

One of the major crops that has been promoted by these projects is cassava. The country has in the recent past been faced with escalating mealie meal prices on the market, with a 25kilogramme bag of mealie meal being sold at about KR70. According to a report by Mr Douglas Siakalima, promoting cassava growth in the country will not only help to stabilise the escalating mealie meal prices but will also help to improve food security and nutrition.

Apart from fluctuations in mealie meal prices, drought incidences have also led to decisions of diversifying crops so as to ensure food security within the country. In 2002, Zambia was hit by its second year of drought in a row. In 2005, a third serious drought was experienced, leading to failure of many maize crops planted during this period.

Owing to such situations, Farmers in Zambia have been trying out new farming methods to combat periods of drought. They have tried new seeds and new methods of crop rotation. They have also tried drought resistant crops such as cowpeas and cassava, instead of maize.

In October 2006, the government formulated the Food Crop Diversification Support Project through the Zambia Agriculture Research Institute (ZARI). The main aim of this project was to promote crops such as cassava and sweet potato and consequently reduce over dependency on maize. On April 28th 2009, the Lusaka times reported the completion of the cassava processing plant for women in Kanakantapa village in Chongwe. This project was funded by the Japanese embassy in collaboration with the ministry of agriculture to promote cassava growing and as an income generation source.
The Program against Malnutrition has also played a major role in pursuing deliberate cassava promotion programs. These projects, among others, have led to the development of local cassava varieties such as Mweru, Nalumino, Kapumba, Bangweulu, Chila, Tanganyika and Kampolombo and ultimately, an increase in production. By improving collection of production and yield statistics, the government has taken the first steps towards improving the profile and status of cassava in food security. (Hichaambwa, 2005).

In order to enhance cassava production among farmers, PAM and other partners want to introduce an innovation packaging consisting of maize and cassava meal in one 25kilogramme bag. This innovation would enhance market access for cassava farmers and consumption in the country. According to PAM, cassava is now increasingly recognised as an important staple in Zambia, with more than 562,200 cassava growers.

Currently, about half of the world’s production of cassava is in Africa, with almost 70% of it being harvested in Nigeria, Congo and Tanzania (FAO 2000). Throughout the continent, cassava serves as either a primary staple or a secondary food staple.

Many studies have suggested that cassava (*Manihot esculenta*) is nutritious and serves as a good food security crop. Cassava leaves (locally known as *katapa*) make a good vegetable as they are a source of minerals, vitamins and proteins. The roots on the other hand, are rich in carbohydrates, thus aiding in providing a balanced diet for many individuals. Cassava can be consumed as a snack, roasted, fried or boiled or ground into flour. Ground cassava meal is commonly used in combination with maize meal to prepare *nshima*. In certain rural communities of Luapula Province, traditional uses of cassava include floor polish, hair chemicals, animal and fish feed from the leaves, firewood and seeds from the stems and fodder from the peels. Apart from being a drought tolerant crop, cassava has the ability to suppress weeds thus nullifying the need for herbicides. In addition to this, it requires little or no fertilisation, yet is very high yielding.

Cassava can be harvested at any time of the year and has the ability to be stored underground for lengthy periods. Whereas other crops such as maize, sorghum, millet, etc are eco regionally specific, cassava is probably the only crop whose production cuts across all ecological regions.
Cassava is Africa’s second most important food staple in terms of per capita calories consumed. It is a major source of calorie for roughly two out of every five Africans. In some countries, cassava is consumed daily and sometimes more than once a day. According to Bokanga (1998) cassava has the potential to increase farm incomes, reduce rural and urban poverty and help close the food gap. It has several other advantages over maize and other grains in areas where there is uncertain rainfall and weak market structure (Blackie 1990).

Many food policy analysts consider cassava an inferior food because it is assumed that its per capita consumption will decline with increasing per capita incomes; without an empirical evidence to support the claims, however. In retrospect, some recent studies have shown that this trend can change (Nweke, 2004).

It is estimated that 30% of the Zambian population depends on cassava as a major staple food. The population that depends on cassava is increasing every year due to the escalating production cost of the tradition staple, maize, as well as the increase in drought incidence. Despite this however, most of the cassava consumers in Zambia are concentrated in Northern and Luapula provinces. This is despite the fact that price fluctuations and drought are experienced throughout the country.

In Luapula Province, were cassava is considered a staple food, production was estimated at 1.3 million metric tons in 2009. In 2010, CSO statistics projected an increase in production of about 200 000 metric tons of cassava from the previous year. In June 2008, FAO pumped about US$335 million into the technical cooperation project in Luapula and central provinces. This project was aimed at promoting profitable cassava production systems, value addition to the crop and increased market access.

Although a number of studies have revealed an increase in cassava production country wide, consumption information on cassava in Zambia still remains limited as most of these studies focus more on production. Following the increase in production countrywide, it is expected that demand for cassava also goes up. Unfortunately, there is very little information on demand for cassava in Zambia. The determinants of demand for cassava vary from one area to another. In one area, demand could be as a result of not having anything else to consume, whereas in another area it could be due to favourable prices or nutritional requirements.
While some consider cassava to be ‘a poor man’s crop’, others have accepted it and adopted it as a staple food. For this reason, it’s also of importance to consider the perceptions of consumers towards the crop. If the government is to ensure food security through cassava, then there’s need to take into consideration the attitudes and perceptions of consumers towards the crop. Apart from this, certain consumers may not be aware of the positive attributes that the crop possesses. With the fluctuations in the maize sector and the deliberate policies by government to diversify the crops grown so as to better the economy, the importance of cassava cannot be ignored.

This study aims at understanding the perceptions of consumers towards cassava and establishing what factors affect their demand for different cassava products. It is hoped that the knowledge that will be generated from this research will be useful in developing the cassava sector in Zambia.

1.2 Problem statement

Many studies have revealed an increase in cassava production within the country. With the help of the various on-going crop diversification projects, it is safe to say that the government and other institutions are making significant efforts in enhancing food security in Zambia. Despite these efforts however, the cassava sector is seemingly more pronounced on the production side, thus overlooking consumers. So far, not much is known concerning consumers’ perceptions and what really affects their demand for cassava and cassava products.

The success of any agricultural food product is highly dependent on its ability to attract and maintain consumers. Suppose production of cassava increases yet consumers have not fully accepted the crop or are ignorant about its positive attributes? Or production of improved varieties goes up yet demand is still very low? If cassava is to serve as a food security crop in Zambia, and if the sector is to be more efficient and successful, then there is need to have some knowledge of consumers.

It is a well known fact that much of the cassava produced in Zambia is consumed in the Northern part. For cassava to serve its full purpose, markets must be available in all parts of the country. In areas like Lusaka, where the majority of the population lives, not much
information is available concerning demand for cassava. Agriculture is not only about production but also about consumption.

Consumer perceptions and determinants of household demand play an important role in that they help to provide a link between production and consumption. It would serve little purpose if the government encouraged production of cassava yet not much of it is being consumed. Apart from that, information on consumption enables us to identify the market potential of these cassava products.

According to Korwama and Akoroda (2003), in order for efficient production and marketing techniques to be adopted, reliable consumption and demand data must be collected. The purpose of this study is, therefore, to address this gap in knowledge concerning the demand side of the cassava sector.

1.3 Objectives

1.3.1 General objective: the overall objective of this study is to find out the perceptions of consumers towards cassava and the factors that determine their demand for cassava products.

1.3.2 Specific objectives:

1. To identify the factors affecting quantity of cassava demanded by households
2. To describe the socio economic characteristics of cassava consumers.
3. To identify the household characteristics of cassava consumers.
4. To assess the role of consumer perception on quantity of cassava demanded.

1.4 Justification

In Luapula Province, were cassava is considered a staple food, production was estimated at 1.3 million metric tons in 2009. In 2010, CSO statistics projected an increase in production of about 200 000 metric tons of cassava from the previous year. In June 2008, FAO pumped about US$335 million into the technical cooperation project in Luapula and central provinces. This project was aimed at promoting profitable cassava production systems, value addition to the crop and increased market access.
These and many other projects are a clear indication that there has been a lot of focus on increasing cassava production within the country. However, there has been a lot of concentration on supply and production rather than demand. For any industry or sector to thrive, there must be a link between supply and demand. This research will therefore help in that, by knowing what lies on the consumers’ end, efficiency in production can be achieved. Production can increase as much as possible but there is need to know what causes different individuals to consume cassava products and their perceptions towards these products.

In addition to this, knowing the determinants of demand will help cassava farmers and traders to know which varieties are more preferable and which of the many cassava products are of high demand. Similarly, by understanding the attitudes of various consumers towards cassava products they will be able to know on what areas to improve in order to make the sector better. Perceptions and determinants of demand can also indirectly help to improve the markets available for cassava products.

One of the major reasons cassava is being encouraged in Zambia is because of its role as a food security crop. This means that in the absence of maize, cassava can still fill the gap. This research comes into play because by knowing the determinants of demand for cassava, it will reveal how much of a good substitute it is for maize and whether or not its role as a food security crop is being accepted.

The supply of cassava products may have an impact on the consumption. However, supply can also be driven by demand. Market information is a critical component for the survival of any enterprise. The government in particular has a crucial role to play in ensuring that marketing information is readily available to the farmers. However, a majority of traders get market information from friends, relatives, business colleagues and own observations not from any government agency or institution. There is virtually no cassava market information available and this limits the utilisation of cassava in the industry.

It is therefore necessary to undertake this research as it seeks to analyse the demand for cassava and cassava products in Lusaka district and the perceptions that various households have towards cassava.
1.5 Hypotheses

1. Household income has no influence on the quantity of cassava demanded.
2. The price of cassava has no influence on the quantity demanded.
3. Availability of substitutes has no influence on quantity of cassava consumed.

1.6 Outline of the study

This research report is divided into five (5) chapters and is laid out as follows. After presenting the study introduction and background, statement of the problem, study significance and study scope in chapter one, chapter two presents a discussion on the literature review. Chapter three presents the research methodology. Study findings are presented and discussed in chapter four and the paper concludes with chapter five which contains the study conclusions and recommendations. The report also has an attachment of the questionnaire, the data collection tool that was used in this research.
CHAPTER 2
LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature pertaining to cassava consumption in different places. It focuses on how demand for cassava varies from one country to another and brings out the different factors that influence demand in these places. In most cases, these factors include income, availability of substitutes and the price of cassava. Apart from that, the perceptions that consumers have towards cassava are studied.

2.2 Definition of key terms

2.2.1 Cassava products: in Zambia, the major and most common cassava products are cassava flour (cassava meal), cassava leaves (locally known as katapa) and cassava chips (either boiled or roasted as a snack). This study focuses on these three. Consumption of these products varies from one place to another.

2.2.2 Consumer perceptions: Consumer perception encompasses a customer’s impression, and awareness and consciousness about a product. In this case, the focus is on consumers’ thoughts and levels of awareness concerning cassava.

2.2.3 Demand: In economics, demand can be defined as how much of an item one is willing, ready and able to purchase. It can also be defined as the willingness of a consumer to purchase a good or service at a certain price.

2.3 Determinants of demand: a determinant is a factor that affects influences the amount of demand for a good or service. Price in many cases is most likely the most fundamental determinant of demand, since it’s often the first thing people think about when deciding how much of an item to buy. While most people look at their income when demanding for a product, the relationship between income and demand is not always straightforward. For a normal good, when the income of an individual does up, the demand for a commodity also increases. For certain goods however, an increase in income implies a decrease in demand for
the commodity. These are referred to as inferior goods. Cassava has in some areas been described as an inferior good, as a poor man’s food.

When deciding how much of a commodity to buy, consumers also take into account the prices of both substitutes and complements. Substitutes are goods that are used in place of one another. Complements on the other hand, are goods that people tend to use together (ibid). In Zambia for example, when using cassava meal, people usually prepare it in combination with maize meal.

Consumer tastes and preferences, among others, also play a role in determining the demand for a product/good.

In a study by Daniel Tsegai and Patrick Kormawa (2002) in Kaduna, Nigeria, the determinants of demand for cassava were estimated and its demand elasticity compared to that of other root and tuber crops that are consumed in the country. These include yam, potato and cocoyam. Household consumption expenditures were used in the analysis as a proxy for income. This is because data on expenditures are generally more reliable than income data as questions of income are sensitive and it is expected that households underestimate their income.

The results of the study confirmed that the budget share of cassava and cassava products in total food expenditure is higher among the poor. Therefore, cassava and cassava products are more important among the poor than the rich. The estimates in this study found cassava to be a price and income inelastic food item. This indicates that cassava tuber is a necessity for the poor households. Though it is noticed that the expenditure share is relatively higher among the poor than the rich, its consumption by the rich has also increased. With processing and post-harvest technology, cassava has the potential to be demanded more by the urban households of Kaduna.

Ogunniyi L.T (2011) conducted a separate study on Consumption of Cassava Products in Oyo State, Nigeria. In this area, majority of the households consumed a number of cassava products, among them fufu, which is a dough made from boiled cassava and eaten with soup. The most significant factor affecting demand for cassava was found to be price. However, the effect of price was found to vary depending on what the cassava product was. In many Nigerian states, cassava is considered as a staple food, whereas in Zambia, it’s still in its
initial stages and is yet to realize its full potential both as a food security crop and as a substitute for maize.

According to Carolina González and Nancy Johnson (2009), Brazilians base their demand for cassava on a number of characteristics. These include colour, taste, texture, time of cooking, fibre and size. Apart from these, demand is also affected by price, income and location.

The aim of this research was to fill the information gap about consumer preferences for quality characteristics in order to help producers and researchers to develop varieties more attractive for the markets. Households were asked to reveal their preferences on cassava. Knowledge about implicit values of quality characteristics indicates which attributes should be focused on and which characteristics could be allowed to vary. This way, proper market channels could be established, with the level of demand for the crop being assessed.

Households consumed cassava on average 2.84 times per week. This number shows the importance of cassava as a basic staple. The average quantity of cassava eaten per meal in a household was estimated to be 335g.

Regarding the preferences, respondents were asked to rank, in order of importance, the three main characteristics they consider when buying or eating cassava. The results show that ease of peeling (29%) is the most important characteristic for consumers. One possible explanation is that this characteristic is easy to test, and people consider it an indicator not only of amount of work involved in peeling but also of other quality characteristics. After ease of peeling, time of cooking (28%) is another important characteristics for consumers, followed by texture (16%) and then colour (11%). Price had the lowest place in the consumer ranking, which is consistent with the price inelasticity of cassava.

Still, some individuals claimed they had never tasted eaten or even seen cassava. This suggests that complementary research needs to be done using other methodologies such as sensorial techniques, for example, in order to know the real economic importance of these characteristics.

Langmead and Baker Ltd (2003) identified a number of factors that must be addressed in order to achieve goals such as increasing sales and demand for cassava in Zambia. These
include increasing customers’ awareness of cassava products, increasing customers’ willingness and ability to buy.

Unless potential purchasers are aware of the existence of cassava and its benefits vis-à-vis other products, they are unlikely to buy it, unless on impulse. To encourage new users and maintain their regular use of cassava they must be convinced of the benefits. Apart from that, customers may be aware of cassava, but they must still be persuaded to buy. They will make their decision based on a wide range factors, such as the realities of the marketplace and their own perceptions and preferences.

Langmead also identified a number of organisations that were willing to serve as potential venture partners with cassava farmers if both demand and supply were seen to be promising. Examples of these are Program against Malnutrition (PAM), Smallholder Enterprise and Marketing Program (SHEMP), Care International and Africare, among others.

2.4 Conceptual framework

Previous research suggests that consumer perceptions towards a product provide a solid ground for purchasing decisions. According to H. Kambiz (2012), the analysis of consumer perceptions is therefore extremely important in understanding consumers as it will help producers and marketers to know what influences consumers’ patterns of demand for a product.

Consumer perception theory is any attempt to understand how a consumer’s perception of a product or a service influences demand. Usually, consumer perception theory is used by marketers or promoters when designing a campaign for a product. These marketers or traders target to increase sales or supply of a product depending on the feelings or thought of the consumer towards certain attributes of a product.

To measure consumer perception, a market research has to be done on the product by creating a survey that will reveal the views of various consumers (Schiffman and Kanuk, 2009). It is important therefore to understand the consumption end of a product in order to know how to go about increasing its demand.
The factors that affect demand for cassava vary from one place to another. Among the many factors are price of cassava, income level, tastes and preferences. Similarly, Preference for either maize or cassava varies from one area of the country to another, with households in areas of high cassava cultivation tending to prefer it to maize. Households in cassava-abundant areas such as Luapula consume more cassava than maize, while the opposite is the case in other areas, such as Western and Lusaka Province. Langmead (2003) concluded that cassava products in Zambia compete for market attention with a number of other products in the domestic market, particularly with maize. Of particular importance is maize meal, against which cassava meal offers potential as a substitute.

In this study, a Linear Regression model was used to determine what factors influence the demand for cassava. This model can be used to explain which of the independent variables had a significant effect on the dependent variable, and the direction of the effect.

The conceptual model was defined as follows:

\[ y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \cdots + \epsilon \]

Where

- \( y \) = the dependent variable, which in this case is quantity of cassava meal demanded.
- \( x_i \) = the independent variables explaining the variation in \( y \).
- \( \epsilon \) = error term

The independent variables include price of maize meal, level of education, level of household income and distance to the market, among others.
CHAPTER 3
METHODOLOGY

3.1 Introduction

This chapter reviews the methods used in collecting and analysing data from the sampled respondents within Lusaka District. It is intended to show how the study was conducted using research tools. It starts by explaining the sampling technique and the sample size from which data was collected. The chapter goes on to describe the data collection methods. The section on data collection methods explains the tools that were used for collecting data and the variables that were collected. The analytical framework then follows, outlining descriptive statistics and the model for data processing, giving reasons why the model has been chosen.

3.2. Sampling procedure

Sampling is a process of selecting units from a population of interest, so that by studying the sample, the results obtained from the sample may be generalized to the population from which the sample had been chosen (Leedy and Ormrod, 2004). Thus, the characteristics obtained from the sample should reflect approximately the same characteristics as the population. Since the data obtained from a sample will be generalized to the whole population, the manner in which the sample units are selected is important. A sample should be representative; therefore, the sample size should be large enough to conduct reliable statistical analysis. According to Bless and Smith (2000), in order to get reliable statistics, a sample should have at least 30 units.

In this study, simple random sampling was used to choose a sample. A sample size of 100 respondents was chosen within Lusaka, with a household as a sampling unit. Lusaka was chosen because it’s a city with people from all provinces, diverse cultures and represents individuals with varying levels of income. The study was conducted in Makeni, Chelstone and Ngombe, representing Low density, Medium density and high density areas, respectively.
3.3 Data collection methods

In this study, both primary and secondary data were collected. Primary data was collected from households using structured questionnaires administered as interviews. The respondent was expected to be the household head. The questionnaire was structured in such a way that household demographics and consumption patterns were captured. Each household was required to give details on their monthly expenditure on major food items. Apart from that, they were asked for their perceptions towards cassava products and also what they think should be done to improve on the demand for cassava in Lusaka and Zambia in general.

Secondary Data was collected from various organisations such as the Ministry of Agriculture, Silver Catering Services, CSO and various Publications.

3.4 Data analysis

The data collected was first analysed in SPSS to obtain descriptive statistics. Multicollinearity was found to be high in some of the variables. These variables were then dropped to correct for multicollinearity. The average VIF value was 2.30, which is within reasonable range. The data was tested using the Breusch-Pagan Godfrey test for potential heteroskedasticity which may be present across households due to the use of cross sectional data. Heteroskedasticity was considered significant at 5% level. The data was then robusted to correct for heteroskedasticity.

A multiple linear regression model was run in STATA.

3.5 Limitations of the study

In this research, a sample size of 120 consumers was supposed to be sampled. However, due to time and money constraints, not all intended households were interviewed. Apart from that, some respondents were quite reluctant to give out data such as that on monthly income, especially for those that weren’t household heads. This probably led to false incomes being given.
CHAPTER 4

STUDY FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents and discusses the study findings. It begins with a presentation and
discussion of the demographic characteristics. These include factors such as household
income, age, sex of the respondent, level of education, marital status, to mention but a few.
The chapter is finally concluded by a discussion on the results of the linear regression and the
interpretations.

4.2 Demographic Characteristics

Table 1: Distribution of Households by Sex

<table>
<thead>
<tr>
<th>Sex</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>63</td>
<td>63</td>
</tr>
<tr>
<td>Female</td>
<td>37</td>
<td>37</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: own survey data (2013)

The majority of the respondents were male. As shown in the table, 63% were male while 37%
were female. This suggests that most of the households that were interviewed were headed
by males, as is the case for most households in Lusaka.

Table 2: Distribution of Households by Marital Status

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Married</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>Divorced</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Widowed</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Own Survey Data (2013)

The table shows that half of the respondents were married (50%). Singles made up 39% of
the households interviewed while divorced and widowed respondents made up 5% and 6%,
respectively.
Table 3: Distribution of Households by Level of Education

<table>
<thead>
<tr>
<th>Level of education</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Secondary</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Tertiary</td>
<td>58</td>
<td>58</td>
</tr>
<tr>
<td>None</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: own survey data (2013)

Of the consumers interviewed, none of them were uneducated. Over half of the respondents (58%) had attained tertiary level education. Lusaka is an urban area and therefore, unlike rural areas, it’s expected that most of the respondents have been to school. This applies also to the results showing that 39% have at least attained secondary school education, with only 3% having gone up to primary level.

Table 4: Distribution of households by Level of Income

<table>
<thead>
<tr>
<th>Level of Income</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below KR1000</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Between KR1000-KR5000</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>Above KR5000</td>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Own Survey Data (2013)

The respondents were asked how much they spend on food items on average per month. Of the 100 households, only 16% spend above KR5000 on food items per month. This group of individuals fall in the high income group. The middle income group made up 45% of the respondents, spending between KR1000-KR5000 on food items on average per month. The third group fell among the low income group, with a monthly expenditure on food items of less than KR1000. The majority of the low income group was found in Ngombe compound.
4.3 Consumer Perceptions

The study comprised a segment were respondents were asked to give their perceptions towards certain attributes of cassava meal, in comparison to the country’s staple, maize meal.

The consumers were asked to give responses as to whether they thought cassava meal was nutritious, affordable, easy to prepare, available on the market and tasty, all in comparison to maize meal. They were also asked whether or not they would substitute maize meal for cassava meal. Lastly, consumers were asked if they would recommend cassava meal to others. These results reveal the value that consumers attach to cassava products.

Table 5: Consumer Perceptions

<table>
<thead>
<tr>
<th>Nutritious (CM1)</th>
<th>Affordable (CM2)</th>
<th>Easy to prepare (CM3)</th>
<th>Availability (CM4)</th>
<th>Tasty (CM5)</th>
<th>Substitutability (CM6)</th>
<th>Advice (CM7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YES</td>
<td>27</td>
<td>27</td>
<td>7</td>
<td>13</td>
<td>19</td>
<td>14</td>
</tr>
<tr>
<td>NO</td>
<td>73</td>
<td>73</td>
<td>93</td>
<td>87</td>
<td>81</td>
<td>86</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Twenty Seven (27) percent of the respondents thought cassava meal is more nutritious and affordable than maize meal. Most of these were individuals that actually have cassava meal as a part of their monthly expenditure.

Only 7% of the interviewed households agreed to cassava meal being easier to prepare than maize meal. 93% thought otherwise. This is probably due to the fact that since cassava meal is flour, it tends to be too fine, thus making it difficult to use when preparing nshima. This can however be countered by mixing cassava with maize meal. Asked about its availability on the market, 13% of the households gave a positive response. Nineteen (19) percent said cassava meal is tastier than maize meal, while 81% thought otherwise. In line with being able to substitute maize for cassava meal, only 14% of the households agreed that it would make a good substitute.
Finally, of the 100 respondents, 25% revealed that they would actually advise fellow individuals to take on cassava meal as a part of their household food share. The opposite was true for the remaining 75% of the respondents.

Apart from the above factors, respondents that consumed cassava products were asked for their source of awareness, that is, how they came to know about cassava. 15% of them knew about cassava meal from the village while 8.3% knew about it from friends.

Concerning assets owned, respondents were asked to list the assets owned, whether agricultural or non-agricultural. Examples of such assets include water pumps and motor vehicles, respectively. The value of each asset was then obtained and used to symbolise wealth of a household. For example, households with assets such as generators and oxen were taken to be wealthier than those whose assets comprised crop sprayers, radios and television. Dummy variables were created for level of income, level of education, marital status and sex. For each of these, one variable was dropped to avoid the dummy variable trap. The dependent variable in this study was the value of cassava meal demanded. This was used as a proxy for quantity demanded. Households were asked to give estimates on how much they spend on cassava meal monthly. Cassava meal expenditure was then regressed on a number of variables to determine which of them had any effect on the demand for cassava.

Cassava meal expenditure was also used to estimate the level of consumption of other cassava products, in this case, cassava chips and cassava leaves.

**Regression results**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of observations</td>
<td>100</td>
</tr>
<tr>
<td>$F(20, 79)$</td>
<td>3.44</td>
</tr>
<tr>
<td>Prob $&gt; F$</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.7070</td>
</tr>
<tr>
<td>Root MSE</td>
<td>.54262</td>
</tr>
<tr>
<td>Variable</td>
<td>Coef.</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Age</td>
<td>.003716</td>
</tr>
<tr>
<td>Distance to market</td>
<td>-.0203777</td>
</tr>
<tr>
<td>Monthly spending</td>
<td>-.2017471</td>
</tr>
<tr>
<td>Food meal expenditure</td>
<td>.1818741</td>
</tr>
<tr>
<td>Male dummy</td>
<td>.2430056</td>
</tr>
<tr>
<td>Married dummy</td>
<td>-.3311738</td>
</tr>
<tr>
<td>Single headed dummy</td>
<td>.1957727</td>
</tr>
<tr>
<td>Income dummy</td>
<td>-.1279714</td>
</tr>
<tr>
<td>Environment</td>
<td>.0079279</td>
</tr>
<tr>
<td>Land ownership</td>
<td>.3261062</td>
</tr>
<tr>
<td>Location</td>
<td>-.1407006</td>
</tr>
</tbody>
</table>
Table 7: Regression Output for Significant Variable

|                   | Coefficient. | Robust std.error | T   | p>|t|  | 95% Conf. Interval |
|-------------------|--------------|------------------|-----|-----|------------------|
| Preferred meal    | -1.468538    | .4689993         | -3.13| 0.002| -2.402058         | -.5350185 |
| Cassava meal price| -.9189506    | .4334106         | -2.12| 0.037| -1.781633         | -.0562684 |
| Maize meal price  | 1.040365     | .3165311         | 3.29 | 0.002| .4103259          | 1.670405  |

Source: analysis results (2013)

The model was found to be significant at 5% level of significance, meaning the variation in cassava expenditure was explained satisfactorily. Given the value of R squared, the variables explained 70.7% of the variation in the dependent variable. Price of cassava meal, meal preference and price of maize meal were found to be significant at 95% confidence with p values of 0.037, 0.002 and 0.002, respectively.

The variable indicating preference for maize meal was negatively related to demand for cassava. As is expected, individuals that prefer maize meal to cassava meal are less likely to demand cassava meal.

The price of cassava meal was also found to be directly related to its demand. An increase in the price of cassava meal implies a decrease in demand. The price of a commodity has a huge effect on its demand (Ahuja, 2006). According to Economic Theory, the price of a commodity is negatively related to quantity demanded. In certain areas, cassava is considered to be a staple food, such that fluctuations in prices will have very little effect on the quantity demanded. In Nigeria for example, cassava products were found to be price and income inelastic, making it a necessity especially among poor households (D. Tsegai and P. Kormawa, 2002).

The third significant variable, price of maize meal showed a positive relationship with demand for cassava meal. This means that as the price of maize meal goes up, more of cassava meals is demanded. While demand for cassava meal is still low, this relationship shows that consumers choose to purchase it when the maize meal prices go up. It could either be purchased as a substitute, to replace maize meal, or as a complement to be used in
combination with maize meal. The latter is usually the case in Zambia, as most cassava consuming households tend to use it in combination with maize meal.

The level of household income was insignificant in this study. Other studies however, have shown that income does affect the demand for cassava. This is dependent on whether cassava is an inferior or normal good in that area. In the Philippines, cassava is considered to be a poor man’s crop, an inferior good. This means that as income increase, less of cassava is consumed. (P. Suharno, 2000). On the other hand, in some Nigerian states, cassava products are income inelastic. The implication of this is that demand is constant regardless of the level of income. As mentioned earlier, cassava is a staple food in many parts of Nigeria.

Views were collected on what consumers thought would be the best way to increase demand for cassava products. Most of the respondents suggested that awareness campaigns and promotion programs must be conducted in different areas. This is because; in as much as people know that there is a cassava crop, there are very few people that know its nutritional benefits, let alone, its potential as a food security crop.
CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter starts by concluding based on the findings that can be drawn from the findings and conclusions of the study.

5.2 Conclusion

This study was designed to determine the factors that affect demand for cassava products in Lusaka, in order to answer the objectives of the study. Apart from that, consumer perceptions towards cassava products were also captured to determine what effect they have on demand for cassava. The views generated from this study showed that many people are not aware of the potential that cassava has, not only as a substitute for maize or as a food security crop, but also as a crop that can be of great use in industries such animal feed.

Whereas cassava in the northern region of Zambia is a staple, there is low demand for the crop in Lusaka. This means that the factors that affect demand will vary in the two regions. The dependent variable in this study was regressed on a number of variables as shown in the regression results table. These included age, level of education, level of income, price of maize and cassava meal, availability, meal preference, etc. From these variables, meal preference, price of cassava meal and price of maize meal were found to be significant.

Therefore, according to this study, the main determinants of demand for cassava products are own price, price of maize meal and consumer preference.

In general economics, consumer preferences, own price, price of substitutes and complements are among the major factors that affect demand for a good.
5.3 Recommendations

As the study revealed, many people are unaware of the nutritional benefits of cassava. One of the ways in which this could be countered is by carrying out promotion campaigns to raise the awareness of cassava and its benefits. Consumers need to know that cassava is a good food security crop, nutritious, easy to grow, and so on. Sometimes consumers can be aware of a commodity and its attributes but they still need to be persuaded to buy. Although a number of organisations have shown interest in cassava, more needs to be done to encourage more production and demand. Promotion programs can be expensive, but they usually pay off well when successful.

Apart from this, the Government could help promote cassava by introducing feeding programs in boarding schools and hospitals, especially Children’s hospitals. Increased attention can also be given to the cassava industry by introducing a similar program to that of the Farmer Input Support Program (FISP) for maize. Provision of subsidised inputs would encourage more farmers to develop interest in growing cassava.

To ensure that marketing is improved, the government could start by minimising transport costs. This can be done by maintain good road systems from production to consumption points. In Zambia for example, much of the cassava consumed is produced in Northern and Luapula Province. In order to meet demand in other parts of the country, some of this produce will have to be transported.

In addition to this, various price policies could be put in place to ensure that prices do not fluctuate against the interest of consumers. This plays an important role because cassava is said to be a food security crop, and therefore, it must be made affordable to the average consumer. Lastly, further studies must be undertaken to find out the demand patterns for cassava in all parts of the country.
REFERENCES


Kambiz Hanzee and Sara Ghafelehbashi (2012) The role of product Involvement, knowledge and perceptions in Consumer Purchasing Behaviour


APPENDICES
Consumer perceptions and determinants of demand for cassava products in Lusaka District.

THE UNIVERSITY OF ZAMBIA

Department of Agricultural Economics & Extension Education

This questionnaire is for academic purposes only. Be rest assured that all the information you provide will be treated as private and confidential as possible. Feel free to answer all the questions honestly. Your cooperation in this regard will be highly appreciated.

Instructions: Please write answers in the boxes and blank spaces provided. The respondent must be knowledgeable about the household and cassava products.

1. Name of main respondent..............................................

2. Is the respondent the household head?

   1. Yes [ ]     2. No [ ]

3. What is the sex of the respondent?

   1. Male [ ]

   2. Female [ ]
4. Age (at last birthday)........................

5. What is your marital status?


6. What is your highest level of education?

   1. Primary [ ]   2. Secondary [ ] 3. Tertiary [ ]   4. None [ ]
## 7. SECTION 3: INVENTORY OF ASSETS

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Do you own a...?</td>
<td>How many...s does your household own?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>YES = 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>NO = 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AS01</td>
<td>AS02</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>if you were to sell the items you own today, what would be the value of each one of them (in ZMK)?</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AS03</td>
</tr>
</tbody>
</table>

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HOME STEREO</td>
</tr>
<tr>
<td>2</td>
<td>TELEVISION</td>
</tr>
<tr>
<td>3</td>
<td>PORTABLE PHONE</td>
</tr>
<tr>
<td>4</td>
<td>WATER PUMP</td>
</tr>
<tr>
<td>5</td>
<td>SAW MILL</td>
</tr>
<tr>
<td>6</td>
<td>FOG</td>
</tr>
<tr>
<td>7</td>
<td>FUM PRAYER</td>
</tr>
<tr>
<td>8</td>
<td>GENERATOR</td>
</tr>
<tr>
<td>9</td>
<td>FUEL BARROW</td>
</tr>
<tr>
<td>10</td>
<td>SCYTHE</td>
</tr>
<tr>
<td>11</td>
<td>MOTOR VEHICLE</td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>
SECTION 4: HOUSEHOLD IDENTIFICATION AND AREA CHARACTERISTICS

Instructions: Use the codes on the next page to answer this section

8. Type of toilet used.................................................................
   1. Flash toilet (private)
   2. Flash toilet (shared)
   3. Ventilated improved Pit latrine (private)
   4. Ventilated improved Pit latrine (shared)
   5. Ordinary pit latrine (private)
   6. Ordinary pit latrine (shared)
   7. No toilet/use open air

9. Main walling material of main residential house................................. (Codes B)

10. Main roofing material of main residential house............................... (Codes D)

11. Taking into consideration ALL food sources (own food production + food purchase + help from different sources + food hunted from forest and lakes, etc), how would you assess your family’s food consumption in the past 12 months? (Codes E) .......

12. Distance to the nearest local market from residence........ minutes of walking time.

13. What means of transport do you use most frequently to get to the local market? (Codes F) ............

14. Quality of road to the main market (district) (Codes G)..........................

15. Average one-way transport cost (per person) to the main market using a car (ZMK/person)..............

16. Main source of drinking water................................................ (Codes H)

17. Do you boil water for drinking? .............................................. (Codes C)

18. Do you treat water (chemical treatment) for drinking? ...................... (Codes C)

19. Distance to main water source for drinking from residence........ minutes of walking time.

**Codes C:** 1. No; 2. Yes

**Codes D:** 1. Grass thatch; 2. Iron sheet; 3. Tiles; 4. Asbestos

**Codes E:** 1. Food shortage through the year; 2. Occasional food shortage; 3. No food shortage but no surplus; 4. Food surplus.

**Codes F:** 1. Walking; 2. Bicycle; 3. Tractor; 4. Vehicle; 5. Cart; 6. other, specify......................

**Codes G:** 1= Very poor; 2= Poor; 3= Average; 4=Good; 5= Very good;


**SECTION 6: HOUSEHOLD PURCHASING DATA**

20. What is your average household monthly income?

1. Less than KR1000 [ ]
2. Between KR1000 and KR5000 [ ]
3. Above KR5000 [ ]

21. How much do you spend on food items per month?

1. Below KR500 [ ]
2. Between KR500 and KR1000 [ ]
3. Above KR1000 [ ]

22. What are the main food items consumed by the household?

1. Maize meal [ ]
2. Rice [ ]
3. Cassava meal [ ]
4. Other (specify)..................

23. How much did you spend on cassava meal in the past month?

1. Below KR50 [ ]
2. Between KR50 and KR100 [ ]
3. Above KR100 [ ]
4. None [ ]

24. How much did you spend on maize meal in the past month?

1. Below KR50 [ ]
2. Between KR50 and KR100 [ ]
3. Above KR100 [ ]
4. None [ ]

SECTION 7: CASSAVA CONSUMPTION DATA

25. Do you consume any cassava meal?

1. Yes [ ]
2. No [ ]

26. If your answer to (25) was yes, how did you come to know about cassava meal?

<table>
<thead>
<tr>
<th>No.</th>
<th>Sources of awareness of cassava meal</th>
<th>Tick applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Friends</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TV</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Radio</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Magazines</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>News papers</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Govt. Extension Workers</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Village</td>
<td></td>
</tr>
</tbody>
</table>
27. Do you consume any other cassava products?

   1. Yes [  ]  
   2. No [  ]  

28. If your answer to (27) was yes, which of the following cassava products do you consume?

   1. Cassava leaves (katapa) [  ]  
   2. Cassava chips [  ]  
   3. Other (specify) ....................

29. Do you prefer cassava meal to maize meal?

   1. Yes [  ]  
   2. No [  ]  

30. Does an increase in price of cassava affect your demand for cassava meal?

   1. Yes [  ]  
   2. No [  ]  

31. Does an increase in price of maize meal increase your demand for cassava meal?

   1. Yes [  ]  
   2. No [  ]
32. I would like to know your perceptions towards cassava meal.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Is cassava meal nutritious compared to other meals?</th>
<th>Is cassava meal affordable compared to other meals?</th>
<th>Is cassava meal easier to prepare compared to other meals?</th>
<th>Is cassava meal available on the market?</th>
<th>Is cassava meal more tasty compared to maize meal?</th>
<th>Would you substitute maize meal for cassava meal?</th>
<th>Would you advise anyone to buy cassava meal?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes=1 No=2</td>
<td>Yes=1 No=2</td>
<td>Yes=1 No=2</td>
<td>Yes=1 No=2</td>
<td>Yes=1 No=2</td>
<td>Yes=1 No=2</td>
<td>Yes=1 No=2</td>
</tr>
<tr>
<td>CM1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CM7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

33. Do you think there is high demand for cassava meal in your area?

1. Yes [ ]
2. No [ ]

34. If your answer to (33) was No, what do you think can be done to increase the demand for cassava meal?

(1)..............................................................................
(2)..............................................................................
(3)..............................................................................
(4)..............................................................................

THANK YOU FOR YOUR CO-OPERATION

34