AN INVESTIGATION INTO THE DEMAND CHAIN OF BEANS AND COWPEAS IN MOZAMBIQUE

by

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Submitted in partial fulfillment of the
requirements for the degree of

Masters in Agricultural Management (M Agric)

in the

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December 2006

Dedicated to

my mother and my late father

ACKNOWLEDGEMENTS

I would like to express my deepest and sincere gratitude to my supervisor, Prof. André Jooste, for his guidance, contribution and encouragement in carrying out the study.

I am also deeply thankful to my co-supervisor, Dr W.T. Nell, for his valuable contributions, assistance, patience and encouragement in carrying out the study.

I would like to thank Prof Jess Lowenberg-DeBoer, for his valuable contributions and assistance in carrying out the study.

I am grateful to Dr Zerihun Gudeta for helping with data analysis and his valuable contributions during my research work.

I would like to thank THE FORD FOUNDATION for financial assistance that enabled me to pursue my studies.

Purdue University, Bean/Cowpea CRSP, is gratefully acknowledged for providing financial assistance to carry out the research work and complete the study.

I would like to thank the traders, consumers and other people and institutions contacted in Maputo and Nampula, for their opinions given on the bean and cowpea marketing system in Mozambique during the research work.

I would like to thank the Mozambican Land Association (Amoterra), for their support and encouragement to carry out the study.

I would like to thank the National Directorate for Rural Extension (DNER) for their valuable assistance to carry out the study.

National Institute for Agronomic Research (INIA), especially INIA-Nampula (Posto Agronomico de Nampula), is acknowledged for the facilities made available to me during my research work in Nampula, Mozambique.

Michigan State University (MSU) Project is also acknowledged for helping with data capturing during my research work in Maputo and Nampula, Mozambique.

I would like to thank and express my gratitude to the Centre for Agricultural Management, University of the Free State and special thanks to Mrs. Dora du Plessis for her valuable assistance during my studies.

Also I would like to thank the Department of Agricultural Economics, University of the Free State for their support and assistance during the course of my study.

Special thanks to the International Office, University of the Free State, for their valuable assistance and the facilities made available to me during my studies.

I would like to thank my friend, Antoinette, for her friendly assistance and moral support during the course of my study.

I would like to thank my family, which in many ways contributed to the accomplishment of this study.

Finally, special gratitude and sincere appreciation to my husband and my children for their sacrifice, patience, love and encouragement during the course of my study. I would not have been able to complete this whole process without the aid of my husband. I thank him for his understanding and constant support while I was away undertaking the study.

Julieta Milicinho Eliseu Ziote
2006

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ABSTRACT

In Mozambique marketing systems for beans and cowpeas are limited and poorly organized. This is notwithstanding the fact that beans and cowpeas are cultivated by the majority of smallholders in Mozambique. Improving the marketing of these products should promote production and trade in the country, which in turn could contribute to poverty alleviation and improving the livelihoods of the poor in rural areas. On the demand side very little is known about consumer preferences for beans and cowpeas and how they respond to changes in economic factors (i.e. price and supply).

Knowledge on consumers' preferences for specific grain characteristics of beans and cowpeas should create market opportunities on local and regional markets. Findings of several studies on beans and cowpeas in Africa indicate that systematic and adequate information about consumers' preferences for quality characteristics of beans and cowpeas is important, not only for trade, but also for improving bean and cowpea production and marketing systems.

The primary objective of this study was to investigate the impact of different bean and cowpea characteristics on the probability of consumers to purchase these products. Hence the focus of the study is primarily on the demand chain for beans and cowpeas. A logit model was used to estimate the probability that consumers will prefer a specific attribute of beans and cowpeas. In addition, price and volume variables are also considered.

Questionnaires were designed to interview traders and consumers in Mozambique to gain information about their perceptions relating to market opportunities for beans and cowpeas, consumer preferences regarding the purchase of beans and cowpeas and how these preferences translate into purchase decisions, and how information flows among bean and cowpea supply chain members. Interviews were conducted with transporters, formal wholesalers, informal wholesalers, formal retailers, informal retailers, roadside traders and consumers.

The sample was stratified into 2 markets each in Maputo and Nampula. The markets are Bazuca and Xipamanine in Maputo, and Faina and Muhala in Nampula. Bazuca and Faina are wholesale markets, while Xipamanine and Muhala are retail markets. In total, 131 bean and cowpea traders and 169 consumers were randomly selected. In the Maputo market 4 transporters, 23 wholesalers, 36 retailers and 91 consumers were interviewed. In Nampula 2 transporters, 28 wholesalers, 38 retailers and 78 consumers were interviewed.

The results show that aggregate characteristics (colour and culinary characteristics of beans and cowpeas) are positively and significantly related to the probability of consumers' decisions to purchase beans and cowpeas. From this it can be postulated that the better informed consumers are about the quality characteristics of beans and cowpeas the higher is the probability that they will purchase these commodities. Improved access to market information about the characteristics of beans and cowpeas will increase the probability of consumers to purchase beans and cowpeas from 0.546 to 0.703 for beans and from 0.380 to 0.622 for cowpeas.

Price has a negative and significant relationship with the probability of consumers to purchase beans and cowpeas. That is, an increase of one unit in the price will result in a decrease in the probability of consumers to purchase the selected commodities by 0.00024 for beans and 0.00004 for cowpeas.

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INTRODUCTION

1.1 INTRODUCTION

In recent years, the Mozambican Government (GRM) has introduced reform in an attempt to make agricultural production more market oriented. One of the strategies being implemented is the improvement of marketing systems for agricultural produce, which include market access for smallholder production and provision of marketing information, e.g. information about prices. In spite of these reforms, the structures of agricultural commodity markets remain inadequate and inefficient and consequently unable to improve the supply chain for food crops in the country.

Various factors that could have an effect on food marketing in Mozambique have been identified (Arndt, Schiller & Tarp, 2001; Penzhorn & Arndt, 2002; Carrilho, Benfica, Tschirley & Boughton, 2003; Bias & Donovan, 2003; Arlindo & Tschirley, 2003; Jooste, 2004). One of the considerable challenges facing agricultural commodity marketing agents, particularly traders of beans and cowpeas, is a lack of market information. This leads to a lack of transparency regarding price, and a lack of information about markets and their operation. Traders find it difficult to determine when they are receiving the best prices for beans and cowpeas, and without knowing what the demand for the products is, it is difficult for them to make sound trading decisions.

If farmers and traders are to take advantage of market opportunities they should know and understand what consumers want. Characteristics of beans and cowpeas have an important effect on price and, through price, on the volume of sales. Products with desirable characteristics could provide premium prices, which encourage its production, while products with undesirable characteristics result in low prices that tend to discourage production (Branson & Douglas, 1983;

Cotteril & Westgren, 1994). According to Langyintuo, Lowenberg-DeBoer, Faye, Lambert, Ibro, Moussa, Kergna, Kushwaha, Musa & Ntoukam (2003), the size, colour and quality of cowpeas caused variations of between 63 and 97 percent in cowpea prices in Cameroon, Ghana, Senegal and Nigeria. Production and marketing must be integrated with market strategies so that farmers and traders have incentives and possess knowledge so that they can adjust their production and marketing programs according to consumer demand in the market.

A successful agricultural market structure requires involvement of not only producers and traders and other marketing agents in the marketing system, but also by Government, who has to provide or create the environment to provide access to market information and infrastructure, support research and extension and development of the legal and financial infrastructure required to promote efficient competitive markets (Dinar, 1996). The main purpose of this study is to understand the structure and market system of beans and cowpeas in Mozambique with respect to the role of various intermediaries in the demand chain. It is also important to understand consumers demands regarding time, place and form, as well as, quality of beans and cowpeas. The results of the study will provide additional information that will assist farmers and traders to manage their marketing systems, increase their incomes and their competitiveness in the beans and cowpeas sub-sector in Mozambique. Consumer preference information is also useful to breeders who need to know which desirable characteristics to breed into new varieties of beans and cowpeas.

1.2 PROBLEM STATEMENT

Beans and cowpeas are cultivated by the majority of smallholders in Mozambique, traditionally for home consumption and increasingly for income by rural households, particularly in the northern part of the country (Jooste, 2004; Lowenberg-DeBoer, 2004). In Mozambique marketing systems for beans and

cowpeas are limited and poorly organized. Improving the marketing of these products should promote production and trade in the country.

The most productive region for beans and cowpeas is northern Mozambique, but this area is separated from the principal consumption areas by long distances. The distance between the north (main production area) and the south (main consumption area) has implications for the quantities of beans and cowpeas purchased and prices in the two regions. The poor conditions of roads, high cost of maritime transport and lack of communication facilities have adverse effects on the transportation and marketing of beans and cowpeas in the different regions of the country. These factors increase the cost of supplying beans and cowpeas from the northern region to the south (Arlindo & Tschirley, 2003; Penzhorn & Arndt, 2002; Tickner, 1997). Furthermore, these factors inhibit the participation of small-holders in agricultural commodity markets in general in Mozambique (Bias & Donovan, 2003).

Few rural traders' markets, where producers and traders congregate to buy and sell agricultural commodities like beans and cowpeas, exist in Mozambique (Paton, 2002). The only markets are periodic rural markets called “feiras”, occurring mainly in Zambezia province (DNC/MIC, 2001). The widespread development of informal markets or “feiras” in Mozambique, particularly in Zambezia, indicates that smallholder producers need access to markets for their produce (Lowenberg-DeBoer & Filipe, 2003; Bias & Donovan, 2003; Penzhorn & Arndt, 2002; Santos, Paulo, Miguel, Abdula, Arlindo & Nhane, 2001).

The main marketing agents for beans and cowpeas are itinerant informal traders. Numerous small traders who work either on their own account or on behalf of larger merchants are involved in the gathering and redistribution of beans and cowpeas in the Mozambique market (Lowenberg-DeBoer & Filipe, 2003). Principal factors affecting bean and cowpea trading systems are lack of transportation facilities, lack of storage and difficulty of obtaining credit for

financing trading operations. This leads to high marketing costs for beans and cowpeas; consequently producers receive low prices and consumers pay high prices (Arlindo & Tschirley, 2003).

Knowledge on consumers' preferences for specific grain characteristics of beans and cowpeas should create market opportunities on local and regional markets. In a study by Lowenberg-DeBoer and Filipe (2003), most of the traders in Milage indicated that they purchased speckled beans (sugar beans) and brown beans (khaki beans) for local markets where consumers show strong preferences for these types of beans. Furthermore, they purchased red beans to sell in Malawi (a neighbouring country), where red beans are highly appreciated (Jooste, 2004). Langyintuo, Ntoukam, Murdock, Lowenberg-DeBoer & Miller (2004), in their studies on cowpea preferences in Ghana and Cameroon, found that consumers in the two countries have similar preferences for large grain-size cowpeas, though they differ in their preferences for the grain eye colour of cowpeas. In Ghana, consumers are very particular about black-eyed cowpeas while, in Cameroon, black-eyed cowpeas are not popular.

These findings indicate that systematic and adequate information about consumers' preferences for quality characteristics of beans and cowpeas is important, not only for trade, but also for improving bean and cowpea production and marketing systems. To ensure that varieties of beans and cowpeas produced in Mozambique meet the quality preferences of consumers, market information is essential. The flow of information about consumers' preferences back, through retailers or other trading agents, to farmers as well as research institutions, constitute a valuable input relating to improving the production of beans and cowpeas in Mozambique.

The marketing system for beans and cowpeas would also be improved by increased involvement by different participants, especially role players at farm-level marketing, wholesale marketing and retail marketing. In fact, a better

understanding of the role of traders in the marketing system of beans and cowpeas must be viewed as one of the principal components of the marketing chain. Traders play an important role in responding to both consumers and producers in the demand chain (MacDonald, 2000). In this context, smallholders will be stimulated to produce quantity and quality of beans and cowpeas that are demanded by markets in Mozambique.

1.3 STUDY OBJECTIVES

The primary objective of this study is to determine the impact of different bean and cowpea characteristics on the probability of consumers to purchase these products. Hence the focus of the study is primarily on the demand chain for beans and cowpeas.

In order to meet the primary objective of this study a survey was conducted from which information was extracted to use a Logit model to estimate the probability that consumers will prefer a specific attribute of beans and cowpeas. In addition, price and volume variables are also considered**.**

1.4 OUTLINE OF THE STUDY

The rest of this study is organized as follows:

Chapter 2 examines the physical and economic environments of Mozambique, the trends of world and local production of beans and cowpeas, the patterns of consumption, trade system and prices of beans and cowpeas in Mozambique, and the organizational market structure, particularly regarding supply chain management and marketing channels of beans and cowpeas in Mozambique. **Chapter 3** provides an explanation of data collection and provides an analysis of the data surveyed. In **Chapter 4** a Logit model is estimated to determine the probability of different variables to influence bean and cowpea consumption.

Chapter 5 draws conclusions of the results of the study. In addition, recommendations are made with regard to improvement of the marketing system to better meet the needs of the various role players in the value chain.

CHAPTER 2
BACKGROUND ON AGRICULTURAL SECTOR AND SUPPLY CHAIN MANAGEMENT

2.1 INTRODUCTION

This chapter provides an overview of the main physical and economic indicators in Mozambique. World and local trends regarding the production of beans and cowpeas over time are analyzed and consumption, trade and prices of beans and cowpeas are considered. Prices are analyzed to understand the variation of prices between wholesale and retail markets in the north, centre and south of Mozambique. Supply chain management and structure of the market for beans and cowpeas in Mozambique are described, with specific emphasis on the characteristics of the main marketing channels that are used to move beans and cowpeas from farmers to consumers.

2.2 PHYSICAL RESOURCES AND ECONOMIC INDICATORS

Mozambique is located in the southern part of Africa and lies between latitude 18° 15′ south and longitude 35° 00′ east. The country shares borders with Malawi (1 569 km), South Africa (491 km), Swaziland (105 km), Tanzania (756 km), Zambia (419 km), and Zimbabwe (1 231 km). The country comprises a total area of 789 800 km^2, with approximately 36 million hectares suitable for agriculture (FAO, 2004). The climate is tropical to subtropical, with coastal lowlands, uplands in the central part, high plateaus in the north-west, and mountains in the western region. The climate is characterized by the movement of the inter-tropical convergence zone, with a well-defined rainy season in the northern and central regions, while the southern region is influenced by the sub-cyclonic system, with an erratic rainfall variation in terms of intensity and duration. Temperatures are generally warm, varying widely according to relief and altitude. Soil types and fertility vary, causing regional concentration of major crops (Bias & Donovan,

2003). By mid-2002, the population was estimated at 18.08 million, with a 2.4 percent growth rate per annum, according to official population projections from 1997 to 2010 released by the National Institute of Statistics. About 73 percent of the population lives in rural areas. The average density is 23 people per km^2.

Mozambique experienced rapid economic growth with GDP annual growth at 8 percent on average from 1992 to 2002 (World Bank, 2002). The agricultural sector, including crops, livestock and forestry, accounts for about 35 percent of Mozambique's GDP, employs in excess of 70 percent of the country's working population, and generates over 35 percent of the country's foreign exchange earnings annually (World Bank, 2002). The major crop types produced by the agricultural sector are basic food crops, which include beans and cowpeas, and traditional cash crops like cotton and cashew. Of the 4 million hectares of cultivated land, 53, 25 and 17 percent are planted with cereals, tubers and legumes (beans, cowpeas and others) respectively. The total area planted to beans jointly with other crops has increased in recent years, mainly as a result of the resettlement of the population who have returned to their lands after a long period of absence during the 15 years of civil war (Tschirley, Jayne, Mukumbu, Chisvo, Weber, Zulu, Johansson, Santos & Soroko, 2000). Nevertheless, farmers face several challenges that must be addressed if sustainable growth in bean and cowpea production and consumption in Mozambique is to be promoted. These challenges include:

(i) relatively low yields,
(ii) poor and inadequate market information,
(iii) high transaction costs that limit access to markets, and
(iv) inadequate infrastructure.

2.3 BEAN AND COWPEA PRODUCTION

Beans and cowpeas are cultivated in various countries of the world. The production of bean (Phaseolus vulgaris L.) and cowpea (Vigna unguiculata (L.) Walp.) in the world are shown in Tables 2.1 and 2.2.

World bean production increased during the 1990s, reaching 19.37 million tons (metric) between 1999 and 2000, after which it declined slightly. The top ten producing countries, namely India, Brazil, United States of America, China, Mexico, Myanmar, Indonesia, Argentina, Uganda and Canada, account for about 75 percent of total world production (FAO, 2004).

Table 2.1: Production of beans in the world from 1996/1997 to 2002/2003

Country	1996/1997 (tons)	1997/1998 (tons)	1998/1999 (tons)	1999/2000 (tons)	2000/2001 (tons)	2002/2003 (tons)
India	3.00	3.60	3.00	4.55	4.50	4.34
Brazil	2.85	2.99	2.20	2.89	2.80	3.04
China	1.54	1.30	1.71	1.81	1.70	1.38
USA	1.25	1.31	1.36	1.47	1.11	1.15
Myanmar	0.93	0.84	1.08	1.21	1.25	1.23
Mexico	1.35	0.96	1.26	1.08	1.17	1.16
Indonesia	0.86	0.87	0.90	0.90	0.90	0.90
Argentina	0.23	0.27	0.30	0.31	0.29	0.31
Canada	0.13	0.16	0.19	0.29	0.29	0.29
Uganda	0.23	0.22	0.27	0.30	0.28	0.33
Other	4.44	4.51	4.56	4.56	4.61	4.59
World	**16.78**	**17.03**	**16.83**	**19.37**	**18.90**	**18.82**

Source: *FAO (2004)*

Table 2.2 shows that the majority of cowpeas in the world are produced in West and Central Africa. FAO (2004) estimated that 3.3 million tons of cowpeas were produced worldwide in 2000. The major production areas of cowpeas are Africa (Nigeria, Niger), Asia (India, Myanmar) and the Americas (USA and Brazil).

Table 2.2: Area, production and percentage of cultivated area and production of cowpeas in the world

Regions	Area (hectares)	% area cultivated	Production (tons)	% cowpeas produced
West & Central Africa	22 032 000	85	3 200 000	73
Latin America	2 950 000	11	877 000	20
Eastern & Southern Africa	755 000	3	176 000	4
Other	324 000	1	153 000	3

Source: *FAO (2004); Lowenberg-DeBoer (2004)*

In Mozambique, beans and cowpeas are cultivated by smallholder farmers, mostly during the rainy season under rain-fed conditions (Jooste, 2004). Beans are grown as a sole crop or an intercrop with other crops like maize or cassava, particularly in the highlands, between 500 and 1 800 m above sea level during the rainy season, with mean annual rainfall of 800 to 1 500 mm (Allen, Dessert, Trutman & Voss, 1989). Beans are adapted to sandy to dense soils, but perform best on deep loams which are well drained. Cowpeas, erect and prostrated varieties are grown as sole crop and/or intercropped with maize and cassava (Jooste, 2004). It is grown throughout the country on a wide range of soils, but shows a preference for sandy soils. All cultivated cowpea varieties are considered to be a warm season (summer) crop and are adapted to heat and drought conditions. The optimum temperature for growth and development is around 30°C (Ismail & Hall, 1998; Allen *et al*., 1989).

Mozambican bean production has increased since the early 1990s and production reached 191 300 tons in 1997/1998, mainly in the northern and central regions of Niassa, Cabo Delgado, Nampula, Zambezia and Manica provinces, but experienced a large decline in the 1999/00 season, with lower production in the central and southern regions, probably due to drought and the disaster flooding in the region in 2000 (Jooste, 2004; Bias & Donovan, 2003).

Although the national average of bean production has increased, the yield is relatively low. The yield of bean per unit land area increased from 350 kg/ha in 1996/7 to 450 kg/ha in 2002/2003, but this is low compared to other countries in the southern regions (Jooste, 2004; SNAP, 2002). Table 2.3 shows production of beans in Mozambique from 1996/1997 to 1999/2000. The area harvested, yield and production of beans in the years 2001/2002 to 2002/2003 are shown in Table 2.4.

Table 2.3: Production of beans (MT) in Mozambique, 1996/97 to 1999/00

Provinces	**1996/7**	**1997/98**	**1998/99**	**1999/00**
Cabo Delgado	17 700	26 400	27 056	22 559
Niassa	25 500	25 800	23 967	21 955
Nampula	30 500	34 900	31 462	21 057
Zambezia	18 400	34 900	34 450	29 745
Tete	12 700	15 500	18 626	10 920
Manica	1 000	1 500	2 141	1 531
Sofala	8 800	8 900	9 181	5 928
Inhambane	18 900	20 100	19 562	15 590
Gaza	13 100	16 100	15 303	8 888
Maputo	8 100	7 200	6 842	8 265
Country	**154 700**	**191 300**	**188 590**	**146 437**

Source: *SNAP (2002)*

Table 2.4: Area, yield, and production of beans in Mozambique in the 2001/2002 and 2002/2003 seasons

Season	2001/2003			2002/2003		
Province	**Total area (ha)**	**Yield (ton/ha)**	**Total production (tons)**	**Total area (ha)**	**Yield (ton/ha)**	**Total production (tons)**
Cabo Delgado	55 947	0.58	32 515	56 383	0.59	33 177
Niassa	61 005	0.45	27 540	62 518	0.45	28 221
Nampula	72 131	0.45	32 483	73 830	0.45	33 277
Zambezia	53 723	0.60	32 293	54 875	0.64	35 163
Tete	44 111	0.39	17 204	45 222	0.38	17 050
Manica	3 972	0.36	1 430	4 131	0.35	1 462
Sofala	17 574	0.45	7 908	18 629	0.44	8 227
Inhambane	50 939	0.25	12 735	48 725	0.27	13 127
Gaza	35 275	0.30	10 681	24 710	0.30	7 500
Maputo	11 578	0.39	4 536	7 105	0.33	2 349
Country	406 255	0.44	179 325	396 127	0.45	179 552

Source: *SNAP (2002); Jooste (2004)*

The percentage of households growing and selling cowpeas and beans in 1995/1996 and 1999/2000 are shown in Table 2.6. The proportion of households growing cowpeas and beans increased from 39.5 to 42.5 percent and 6.4 to 7.6 percent respectively over the mentioned period. Similar growth trends are shown for the other categories shown in Table 2.6.

Table 2.5: Total production and proportion of production marketed of cowpeas and beans in 1995/1996 and 1999/2000

Crop	1995/1996			
	Proportion of households growing beans and cowpeas (%)	**Proportion of households harvesting beans and cowpeas (%)**	**Proportion of households selling beans and cowpeas (%)**	**Proportion of bean and cowpea marketed (%)**
Cowpeas	39.5	33.5	4.4	12.2
Beans	6.4	5.2	2.2	35.3
All food crops	100	100	100	100
	1999/2000			
Cowpeas	42.5	36.5	5.6	19.8
Beans	7.6	6.4	3.4	36.5
All food crops	100	100	100	100

Source: *MAP (1996); INE/MADER (2001).*

The driving force of increased bean and cowpea production in Mozambique is the favourable natural conditions that exist in different parts of the country, particularly the northern and central regions. Beans and cowpeas are mainly produced by subsistence farmers, and one of the major constraints of bean and cowpea production is dependence on rain. Other problems experienced by producers and marketers, and which can be associated directly with the marketing of beans and cowpeas, are small and dispersed production units, inadequate crop varieties, low volumes and marketable surpluses subject to variability and fluctuations associated with rainfall, pests and diseases, poor quality of the crops and lack inputs. Adopting improved production practices could enable farmers to increase bean and cowpea production and may also enable them to improve their bean and cowpea marketing systems and household income. Improving agricultural research and extension services could also have a positive effect on production.

2.4 BEAN AND COWPEA CONSUMPTION, TRADE AND PRICES

2.4.1 BEAN AND COWPEA TRADE

World trade in dry beans showed an upward trend during the 1990s, from an average 2.0 million tons per year during the early 1990s to 2.5 million tons per year during the period 1995-1997. In 1998, Myanmar, China and Argentina were the major exporting countries of dry beans (Okamoto, 2004). About 80 per cent of the world trade in cowpea grain is in West Africa. Niger is the principal exporting country, while Nigeria is the principal importing country in the region (Langyintuo et al., 2003, Langyintuo et al., 2004 and Lowenberg-DeBoer, 2004).

The Mozambican marketing system handles relatively little of the total beans and cowpeas produced in the country, mainly because the marketing channels available to bring the product from farmers to consumers are limited. Trade is conducted mainly by informal and formal traders who sell beans and cowpeas in rural and urban areas. Of the 154 700 tons of beans produced in 1996/97, about 47.7 percent was marketed, passing through the hands of formal and informal wholesalers, transporters and retailers. At least 30 percent was marketed from marketable surpluses to deficit regions within the country and 17.7 percent was exported.

It is difficult to obtain reliable data on Mozambican trade with neighbouring countries. However, it is evident from information provided by farmers and informal traders that beans are traded actively across Mozambican borders (Arlindo & Tschirley, 2003). Between 10 000 and 15 000 Mt of beans are traded to Malawi at the Milage border annually (Lowenberg-DeBoer, 2004). Malawi is a principal importer of beans produced in Mozambique (Lowenberg-DeBoer, 2004). The potential market for beans in Mozambique and its neighbouring countries in southern Africa could be improved by marketing organizations, which would allow alliances among producers, traders and consumers. Mozambique has signed

trade protocols with 13 partners in the Southern African Development Community (SADC) and has also signed the World Trade Organization protocol, although it is no longer a member of COMESA, another regional trade commission.

2.4.2 BEAN AND COWPEA PRICES

Nominal wholesale prices for beans and cowpeas in the Nampula, Beira and Maputo markets from 2000 to 2003 are shown in Figures 2.1 and 2.2. Beans and cowpeas are slightly more expensive in Maputo than in Beira and Nampula (Figures 2.1 and 2.2). In general nominal prices at wholesale level showed an increasing trend for both commodities. Interesting to note is that the price spread for cowpeas is a lot larger than for beans.

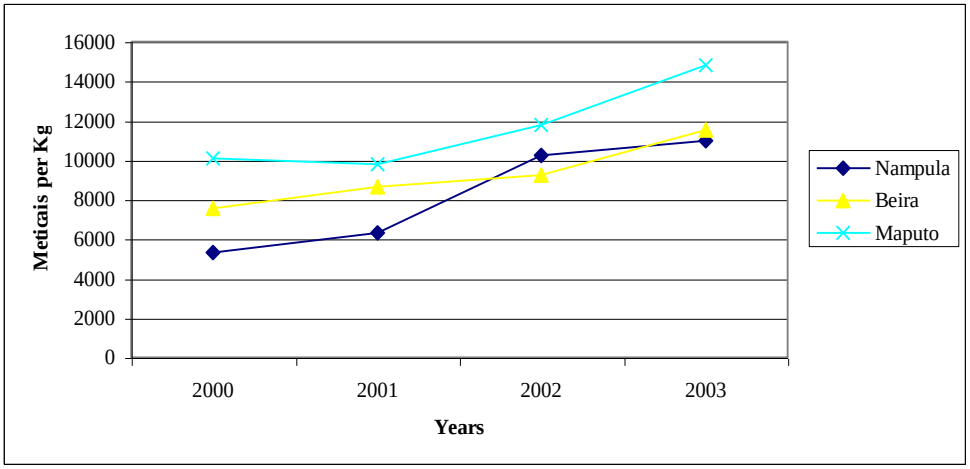

Figure 2.1: Fluctuations in nominal wholesale prices of beans (2000-2003)

Source: *SIMA (2004)*

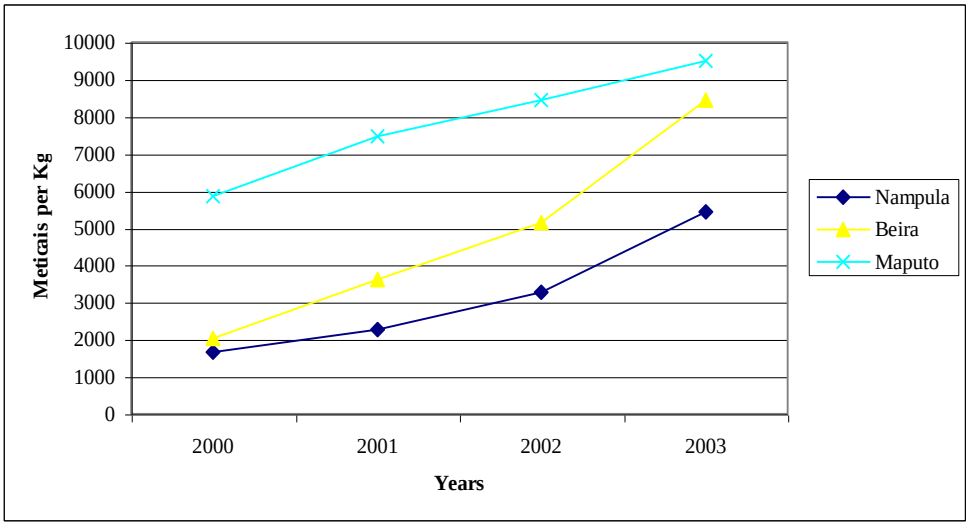

Figure 2.2: Fluctuations in nominal wholesale prices of cowpeas (2000-2003)

Source: *SIMA (2004)*

Trends in nominal retail prices of beans and cowpeas during the period 1991 to 2003 in the Nampula, Beira and Maputo markets are shown in Figures 2.3 and 2.4. As shown in Figure 2.3, the nominal retail price of beans followed a similar trend to that of the wholesale market. The nominal retail price of beans at Nampula, Beira and Maputo markets increased from 1993 and reached a peak in 2003; this rise was substantial in Maputo. The greater increase in bean prices in Maputo, compared to Beira and Nampula, is related to the greater distance and higher transportation costs from northern Mozambique to Maputo, coupled with increased demand for beans in Maputo.

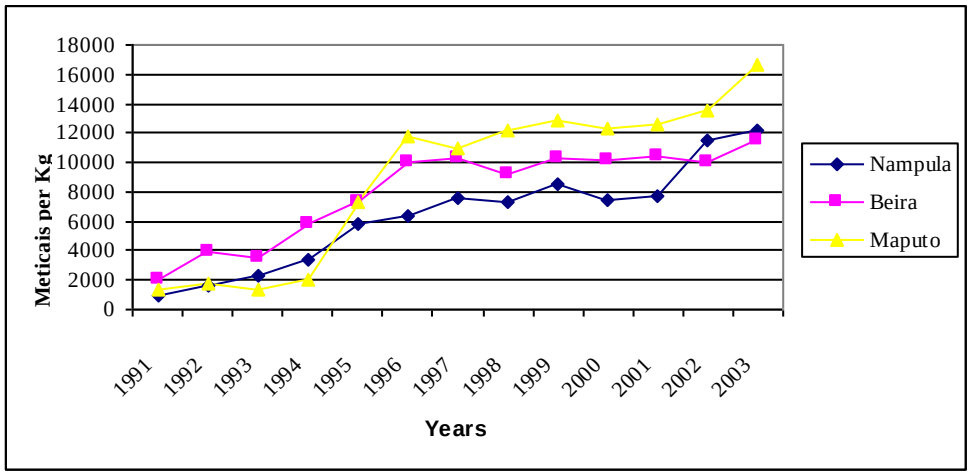

Figure 2.3: Fluctuations in nominal retail price of beans (1991 to 2003)

Source: *SIMA (2004)*

The nominal retail price of cowpeas was relatively constant from 1991 to 2001, after which it increased considerably until 2003, particularly at Maputo markets (Figure 2.4). The reason could once again be the high cost of transporting crops from the north to the south, which leads to higher prices for cowpeas in the southern region (Maputo), coupled with high demand for cowpeas in Maputo.

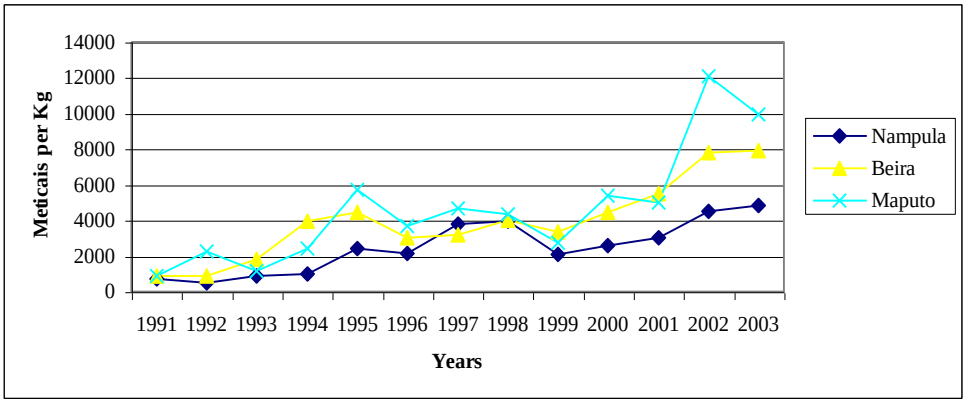

Figure 2.4: Fluctuations in nominal retail prices of cowpeas (1991-2003)

Source: *SIMA (2004)*

2.5 ORGANIZATIONAL STRUCTURE IN BEAN AND COWPEA MARKETS

2.5.1 TRANSPORT

For transport, most traders in Mozambique rely on their own small vehicles, on public transport and/or traveling on foot between production areas (rural areas) and consumption areas (urban areas). Furthermore, they have to travel long distances between isolated farms, buying small quantities of beans and/or cowpeas until they have enough to trade. It could take days, or even weeks, before the trader reaches the production area and buys the quantities of produce required for trading. Other costs relate to transporting the product from the production areas to the market, and hiring a truck or shipment to the main consumption areas which, in the case of the cities of Maputo, Beira and Nampula, is very expensive (Lowenberg-DeBoer & Filipe, 2003). It would be cheaper for large wholesalers or a group of farmers (marketing cooperatives) to accumulate produce from individual farms (small units) to sell to rural wholesalers (in the production areas), instead of requiring traders to visit each farm to collect a small quantity of produce. The rural wholesalers sell to distributing wholesalers or transporters who, in turn, sell to retailers (in the consumption areas).

2.5.2 MARKET STRUCTURE FOR BEANS AND COWPEAS

In Mozambique, marketing beans and cowpeas has been done by both formal and informal systems. Five groups of marketing intermediaries can be distinguished, namely formal wholesalers, informal wholesalers, transporters, formal retailers and informal retailers. Wholesalers and transporters are typically traders who buy beans and cowpeas from farmers for sale to retailers or consumers in urban or rural areas. Therefore, the number of operators declines as the distance from the main consumption area and transport costs increase, due to lack of appropriate transport and communications facilities.

2.5.2.1 Marketing systems at farm level

In Mozambique, little research has been conducted on the way beans and cowpeas are marketed at farm level. The assumption is that farmers sell their beans and/or cowpeas to local markets (consumers) and traders or intermediaries, who buy to sell in urban areas or other rural markets. Bean and cowpea farm-gate prices vary in accordance with supply and demand changes but, in general, farmers have limited influence in the marketplace (they are price takers) and they make fewer marketing decisions than other participants in the bean and cowpea market.

2.5.2.2 Wholesale marketing

Wholesale marketing consists of formal and informal market systems. Informal wholesalers are the main intermediaries between farmers and retailers and several formal wholesalers (“armazenistas”). According to Lowenberg-DeBoer and Filipe (2003), informal wholesalers travel directly to production areas during the harvest period to buy beans and/or cowpeas to sell to formal wholesalers, retailers and directly to consumers in large cities.

However, the quantities traded are not known (due to a lack of market information), but the widespread availability of beans and cowpeas in the markets indicates that the quantities are considerable. Wholesalers operate on a much larger scale than retailers in terms of volumes of beans and cowpeas purchased. Wholesalers generally have capacity for storage, and are involved in domestic and export markets (Shirkhantha, 2004).

2.5.2.3 Retail marketing

Retailers usually buy beans and cowpeas from transporters and wholesalers and sell to consumers at conventional places and in various forms and quantities.

They also buy directly from farmers, particularly at harvest time, when beans and cowpeas are available in the production areas.

Informal retail is on a small scale and earnings are very low. Traders handle small quantities, such as 20-50 kg in total of beans and cowpeas per week or month, depending on demand and storage facilities in the market place. Informal retailers have minimal storage capacity (Lowenberg-DeBoer & Filipe, 2003).

2.6 CONCLUSION

From this chapter it is clear that although the market for beans and cowpeas are developing, it is at a slow pace. Various market intermediaries are active in the bean and cowpea markets, but their efficiency is hampered by factors such as high transaction costs, lack of market information and the low level of institutional organisation at the different levels of the supply chain. Strong growth in prices together with increased supply indicates growing demand for beans and cowpeas.

CHAPTER 3
DESCRIPTION OF SURVEY AND QUALITATIVE RESULTS

3.1 INTRODUCTION

To accomplish the objectives of the study, secondary and primary data were collected. Secondary data such as production, prices, trade and macroeconomic indicators were obtained from Mozambique's General Statistical Office, SIMA (Agricultural Market Information System), Ministry of Agricultural and Rural Development, Ministry of Industry and Trade, and other government and non-government institutions in Mozambique. The information available from various institutions and organizations was used to understand the current marketing system of beans and cowpeas in Mozambique. A questionnaire was designed to gather the primary data on bean and cowpea marketing in Maputo and Nampula.
In this chapter the results of the survey are discussed. This includes trader and consumer demographic characteristics, purchasing patterns, frequency of purchase, prices in different markets where beans and cowpeas are sourced, as well as consumer preferences for specific grain characteristics of beans and cowpeas and access to market information and credit.

3.2 DATA SURVEY AND RESEARCHES SITES

3.2.1 QUESTIONNAIRE

The questionnaires (Addendums 1 and 2) were designed for interviewing traders and consumers in Mozambique to gain information about their perceptions relating to market opportunities for beans and cowpeas, consumer preferences regarding the purchase of beans and cowpeas and how these preferences translate into purchase decisions, and how information flows among bean and cowpea supply chain members.

Interviews were conducted with transporters, formal wholesalers, informal wholesalers, formal retailers, informal retailers and roadside traders. Transporters are important facilitators in the marketing system for beans and cowpeas in Maputo and Nampula, as are formal and informal wholesalers. They are involved in buying and selling beans and cowpeas in large units and they are the first link between farmers and others intermediaries. Retailers generally buy beans and cowpeas from wholesalers and sell them in smaller quantities. Roadside traders are informal traders, selling their products at the roadside. The distinction between formal and informal wholesalers is related to official recognition of trading activities.

The questionnaires were divided into three sections. Section A relates to market location, trader identification and date of the interview. Section B relates to information on the flow of quantities of beans and cowpeas purchased in the markets. Traders and consumers were asked to identify sources of beans and cowpeas purchased, quantities and prices of beans and cowpeas purchased in the previous week and purchases made on the day of the interview. They were also asked to give their opinions on their preferences for beans and cowpeas. Section C provides socio-demographic characteristics of traders and consumers, namely gender, age, marital status, residence and education.

The study was subject to a time limitation and the survey took place between 19 July and 27 August 2004.

3.2.2 RESEARCH SITES AND SAMPLE SITES

Maputo, Nampula and Beira serve as the principal consumer markets in southern and northern Mozambique (Arlindo & Tschirley, 2003) (see Figure 3.1). For purposes of this study only Maputo and Nampula were chosen mainly because of budget and time constrains. The sample was stratified into two markets each in Maputo and Nampula. The markets are Bazuca and Xipamanine in Maputo, and

Faina and Muhala in Nampula. Bazuca and Faina are wholesale markets, while Xipamanine and Muhala are retail markets (Ministerio da Agricultura/Michigan State University, 1993). In total, 131 bean and cowpea traders and 169 consumers were randomly selected. In the Maputo market 4 transporters, 23 wholesalers, 36 retailers and 91 consumers were interviewed. In Nampula two transporters, 28 wholesalers, 38 retailers and 78 consumers were interviewed.

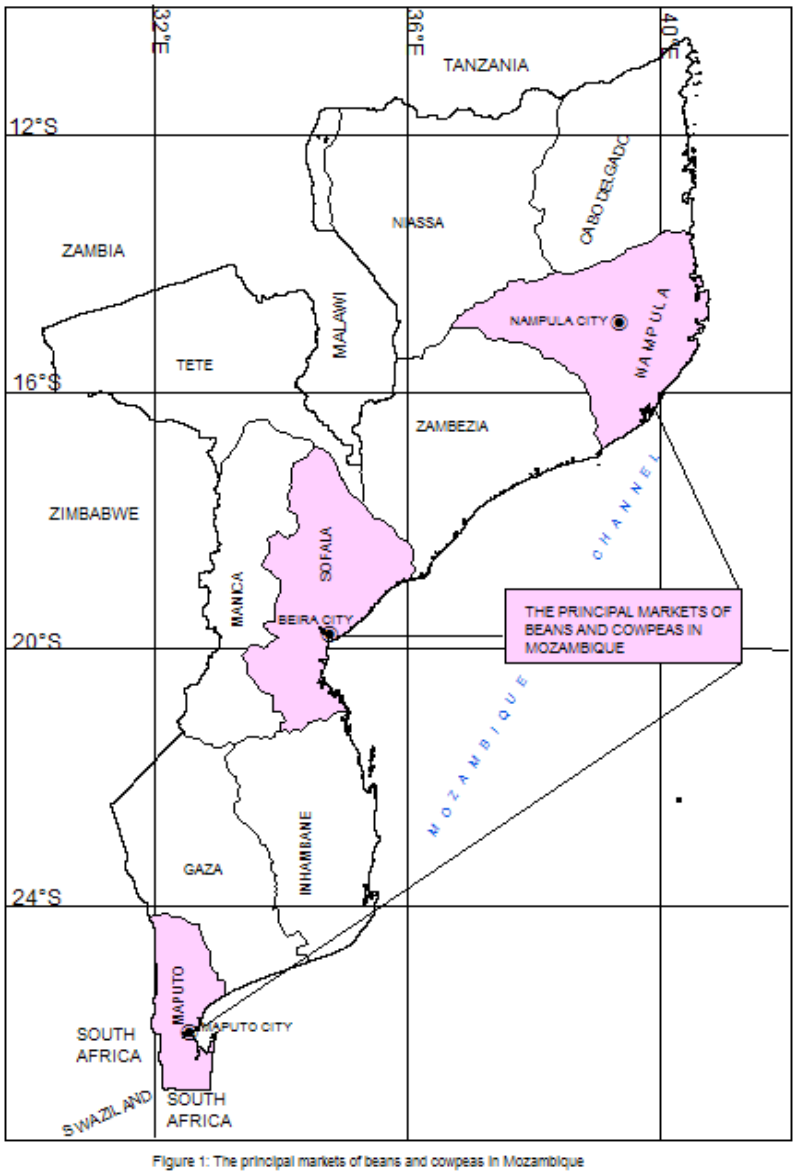

Figure 1: The principal markets of beans and cowpeas in Mozambique

Figure 3.1: The principal markets of beans and cowpeas in Mozambique

3.3 DISCUSSION AND RESULTS

3.3.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The characteristics of the respondents are presented in Tables 3.1, 3.2 and 3.3. The total number of 300 respondents was divided between traders and consumers in Maputo and Nampula markets. The number of traders and consumers in each market was almost equal; i.e. 63 and 68 traders in Maputo and Nampula respectively, and 91 and 78 consumers in Maputo and Nampula respectively.

3.3.1.1 Gender and age of the traders and consumers

Table 3.1 shows the gender and age of the traders and consumers who were interviewed. Of the sample, 56 percent of traders in Maputo were women, whereas only 26 percent of the traders were women in Nampula. In both markets the majority of consumers who were interviewed were women, i.e. 77 and 65 percent respectively in Maputo and Nampula.

The average age of respondents in the total sample was 35 years, with little variation between traders and consumers in Maputo and Nampula (see Table 3.1). The majority of traders were aged 21-35 years and 36-45 years respectively in Maputo and Nampula, while consumers were more diverse in terms of age in the two regions.

Table 3.1: Gender and age of traders and consumers

Characteristics	Traders				Consumers			
	Maputo		Nampula		Maputo		Nampula	
	n	%	n	%	n	%	n	%
Gender								
Male	28	44	50	74	21	23	27	35
Female	35	56	18	26	70	77	51	65
Total	**63**	**100**	**68**	**100**	**91**	**100**	**78**	**100**
Age								
Age below 20 years	2	3	1	1	6	7	6	8
Age 21-35 years	28	44	32	47	26	29	28	36
Age 36-45 years	20	32	18	26	38	42	23	29
Age 46-55 years	13	21	17	25	19	21	21	27
Age over 56 years	0	0	0	0	2	2	0	0
Total	**63**	**100**	**68**	**100**	**91**	**100**	**78**	**100**

3.3.1.2 Marital status and residence of the traders and consumers

Table 3.2 provides information about the characteristics of respondents in relation to their marital status and residence in Maputo and Nampula. Traders and consumers at Maputo and Nampula markets were relatively homogeneous regarding marital status and residence. Most traders and marketers at Maputo and Nampula markets are married. The number of single traders in Maputo are however relatively high. The majority of traders and consumers in Maputo and Nampula live in urban and suburban areas.

Table 3.2: Marital status and residence of the traders and consumers

Characteristics	Traders				Consumers			
	Maputo		Nampula		Maputo		Nampula	
	n	%	n	%	n	%	n	%
Marital status								
Single	22	35	10	15	22	24	13	17
Married	25	40	46	68	33	36	42	54
Separated	7	11	5	7	13	14	10	13
Divorced	3	5	7	10	11	12	7	9
Widower	6	10	0	0	12	13	6	8
Total	**63**	**100**	**68**	**100**	**91**	**100**	**78**	**100**
Residence								
Urban residence	8	13	11	16	18	20	32	41
Suburban residence	55	87	57	84	64	70	45	58
Rural residence	0	0	0	0	9	10	1	1
Total	**63**	**100**	**68**	**100**	**91**	**100**	**78**	**100**

3.3.1.3 Education of trades and consumers

Table 3.3 shows the level of education of respondents in Maputo and Nampula. The majority of traders and consumers have grade 5 and lower. Very few respondents have attended higher grades.

Table 3.3: Education patterns of the sample

Characteristics	Traders				Consumers			
	Maputo		Nampula		Maputo		Nampula	
	n	%	n	%	n	%	n	%
No education	25	40	27	40	56	62	46	59
Grades 5 and lower	26	41	29	43	29	32	22	28
Grades 6-7	12	19	7	10	6	7	6	8
Grades 8-10	0	0	3	4	0	0	2	3
Grades 11-12	0	0	2	3	0	0	2	3
Total	**63**	**100**	**68**	**100**	**91**	**100**	**78**	**100**

3.3.2 QUANTITY OF BEANS AND COWPEAS DEMANDED AND METHOD OF SALES AT MAPUTO AND NAMPULA MARKETS

The volumes of beans and cowpeas purchased are higher in Maputo and Nampula's wholesale markets than in retail markets. Wholesalers operate on a much larger scale than retailers. Wholesalers purchase an average of 10 000 kg of beans and cowpeas per week, while most retailers purchase small quantities, i.e. an average of 50-100 kg per week, as their storage capacity is minimal. The higher volumes sold by wholesalers could probably be explained by the fact that they handle large quantities of the product and hence can offer better prices when necessary. In addition, their price does not include a retail profit margin as would be the case for retailers.

Respondents at Maputo and Nampula markets were asked about the quantities of brown speckled beans, brown beans and cowpeas they usually purchased, how much they had purchased that day and how much they had purchased in the previous week. Figures 3.2 and 3.3 show the quantity of brown speckled beans, brown beans and cowpeas traders usually sold and customers usually purchased at Maputo and Nampula markets.

The majority of retailers at Maputo and Nampula markets usually sell brown speckled beans, brown beans and cowpeas in small quantities, such as 500 g and 1 kg tins. Retailers indicated that they sold 59, 25 and 45 percent of their brown speckled beans, brown beans and cowpeas respectively to consumers in Maputo in 1 kg tins, while sales of 1 kg tins of speckled beans, brown beans and cowpeas accounted for to 55, 54 and 49 percent respectively of total sales in Nampula (Figure 3.2). In Maputo and Nampula, informal wholesalers often sell brown speckled beans and brown beans in quantities of up to 20 kg (referred to as “other” in Figures 3.2) to buyers. The majority of buyers who purchase beans in quantities up to 20 kg sell it at retail markets or at the roadside.

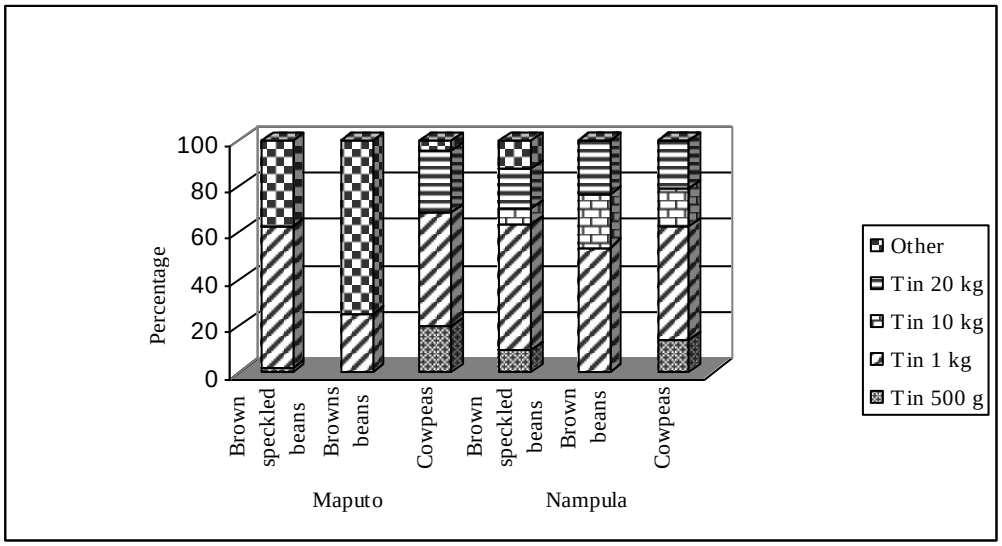

Figure 3.2: Quantity of beans and cowpeas traders usually sell in Maputo and Nampula

The majority of consumers (50 percent) in Maputo and Nampula indicated that they usually buy brown speckled beans, brown beans and cowpeas in quantities of 1 kg, as shown in Figure 3.3.

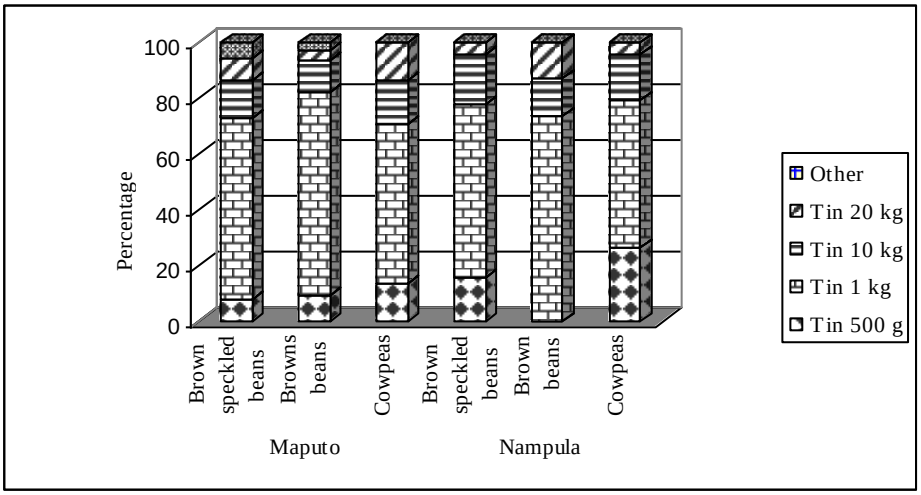

Figure 3.3: Quantity of beans and cowpeas consumers usually buy in Maputo and Nampula

3.3.3 PRICES OF BEANS AND COWPEAS AT MAPUTO AND NAMPULA MARKETS

The survey revealed that beans and cowpeas were more expensive in Maputo than in Nampula market. Differentials in inter-regional price variations are due to many factors. High food prices in Maputo region reflect the transportation costs of transferring the products from production areas (generally the northern and central regions of Mozambique), over long distances, under poor road conditions, to the consumption areas. In addition, high shipments costs and risks relative to the volumes of beans and cowpeas available at the location of production reduce advantages of using maritime transport to connect producing areas (bean and cowpea suppliers) and consumption areas (markets).

The prices of brown speckled beans and brown beans at wholesale and retail markets in Maputo and Nampula varied as follows: (PRB refer to different price brackets for easier reference in the text).

- PRB1 (Price 1) = 6 000- 8 000 MT/kg (Meticais/kilogram)
- PRB2 (Price 2) = 8 001-10 000 MT/kg
- PRB3 (Price 3) = 10 001-12 000 MT/kg
- PRB4 (Price 4) = 12 001-14 000 MT/kg
- PRB5 (Price 5) = 14 001-16 000 MT/kg
- PRB6 (Price 6) = 16 001-18 000 MT/kg

The prices of cowpeas at wholesale and retail markets in Maputo and Nampula varied as follows: (PRC refer to different price brackets for easier reference in the text).

- PRC1 (Price 1) = 2 000-3 500 MT/kg
- PRC2 (Price 2) = 3 501-4 500 MT/kg
- PRC3 (Price 3) = 4 501-5 500 MT/kg
- PRC4 (Price 4) = 5 501-6 500 MT/kg

- PRC5 (Price 5) = 6 501-7 500 MT/kg
- PRC6 (Price 6) = 7 501-8 500 MT/kg

Table 3.4 shows the variations in prices paid to and by traders for brown speckled beans in the quantities that traders usually purchased, sold on the day and sold in the previous week in Maputo and Nampula markets.

Table 3.4: Prices of brown speckled beans usually purchased and sold on the day of the interview and the previous week by traders in Maputo and Nampula

Price	Maputo			Nampula		
	Usually purchase	Selling today	Last week	Usually purchase	Selling today	Last week
PRB1	0	0	0	32	9	0
PRB2	5	0	0	35	40	10
PRB3	26	22	20	19	36	18
PRB4	30	30	35	14	15	26
PRB5	29	39	25	0	0	46
PRB6	10	9	20	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**

Thirty percent of traders indicated that the price of brown speckled beans they usually purchased was PRB4 (12 000-14 000 MT/kg) in Maputo markets, while 35 per cent indicated that the price of brown speckled beans usually purchased in Nampula market was PRB2 (8 000 – 10 000 MT/kg). Thirty-nine and 40 percent of respondents in Maputo and Nampula reported that the prices of brown speckled beans being sold at Maputo and Nampula markets on the day of the interview was PRB5 (14 000-16 000 MT/kg) and PRB2 (8 000 – 10 000 MT/kg) respectively. Regarding brown speckled beans purchased the previous week, 35 and 46 percent of traders indicated that the price was PRB4 (12 000 – 14 000 MT/kg) and PRB 5 (14 000-16 000MT/kg) respectively at Maputo and Nampula markets.

Table 3.5 shows the price variation of brown beans usually purchased sold on the day of the interview and sold the previous week by traders at Maputo and Nampula markets.

Table 3.5: Prices of brown beans usually purchased, sold on the day of the interview and sold the previous week by traders in Maputo and Nampula

Price	Maputo			Nampula		
	Usually purchase	Selling today	Last week	Usually purchase	Selling today	Last week
PRB1	0	0	0	31	23	0
PRB2	0	0	0	50	23	33
PRB3	40	20	20	19	31	53
PRB4	30	10	50	0	23	14
PRB5	20	30	30	0	0	0
PRB6	10	40	0	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**

Forty percent of respondents indicated that the price of the brown beans they usually purchased was PRB3 (10 000-12 000 MT/kg) in Maputo markets, while 50 percent indicated that the price of brown beans usually purchased was PRB2 (8 000-10 000 MT/kg) in Nampula. Forty percent of traders in Maputo indicated that the price of brown beans on sale on the day of the interview was PRB6 (16 000-18 000 MT/kg), while 31 percent in Nampula indicated that the price of brown beans on sale on the day of the interview was PRB3 (10 000-12 000 MT/kg). Regarding brown beans purchased the previous week, 50 percent of respondents in Maputo indicated that the price was PRB4 (12 000-14 000 MT/kg), while 53 percent of traders in Nampula indicated that the price of brown beans purchased the previous week was PRB3 (10 000 – 12 000 MT/kg)

Table 3.6 shows fluctuations in cowpea prices usually purchased, sold on the day of the interview and sold the previous week by and to traders in Maputo and Nampula markets.

Table 3.6: Prices of cowpeas usually purchased, sold on the day of the interview and purchased the previous week by traders in Maputo and Nampula

Price	Maputo			Nampula		
	Usually purchase	Selling today	Last week	Usually purchase	Selling today	Last week
PRC1	0	0	0	43	27	0
PRC2	0	6	0	45	26	17
PRC3	6	16	7	10	19	40
PRC4	26	29	31	2	23	33
PRC5	50	33	40	0	5	10
PRC6	18	16	22	0	0	0
Total	**100**	**100**	**100**	**100**	**100**	**100**

Of the respondents 50 percent indicated that the price of cowpeas usually purchased in Maputo markets was PRC5 (6 500-7 500 MT/kg), while 45 percent of traders indicated that the price of cowpeas usually purchased in Nampula markets was PRC2 (3 500-4 500 MT/kg). With regard to cowpeas on the day of the interview, 33 percent of respondents indicated that the price was PRC5 (6 500-7 500MT/kg) in Maputo, while 27 percent of respondents in Nampula indicated that the price of cowpeas selling that day was PRC1 (2 000-3 500 MT/kg). Forty percent of respondents in Maputo indicated that the price of cowpeas purchased the previous week was PRC5 (6 500-7 500 MT/kg), while 40 percent of respondents in Nampula indicated the price was PRC3 (4 500-5 500MT/kg).

Table 3.7 shows the price variations for brown speckled beans being bought on the day of the interview and bought the previous week by consumers at Maputo and Nampula markets.

Table 3.7: Prices of brown speckled beans purchased on the day of the interview and purchased the previous week by consumers in Maputo and Nampula

Price	Maputo		Nampula	
	Today	Previous week	Today	Previous week
PRB1	0	0	7	0
PRB2	5	0	27	0
PRB3	8	0	35	25
PRB4	29	40	31	40
PRB5	38	30	0	35
PRB6	20	30	0	0
Total	**100**	**100**	**100**	**100**

Thirty eight percent of consumers indicated that the price of brown speckled beans was PRB5 (14 000-16 000 MT/kg) on the day of the interview while 35 percent in Nampula reported a price of PRB3 (10 000-12 000 MT/kg) for that day. Of the respondents, 40 percent reported that the price of brown speckled beans was PRB4 (12 000-14 000 MT/kg) in Maputo and Nampula the previous week.

Table 3.8 shows the price variations in brown beans being bought by consumers in Maputo and Nampula on the day of the interview and the previous week.

Table 3.8: Prices of brown beans purchased by consumers in Maputo and Nampula on the day of the interview and the previous week

	Maputo	Nampula

Price	Today	Last week	Today	Last week
PRB1	0	0	0	0
PRB2	0	0	30	25
PRB3	7	12	44	35
PRB4	15	35	26	40
PRB5	42	28	0	0
PRB6	36	25	0	0
Total	**100**	**100**	**100**	**100**

The majority of respondents in Maputo reported that they paid more for brown beans on the day of the interview than it had been the previous week. In contrast, the price of brown beans had been higher the previous week than on the day of the interview in Nampula.

Table 3.9 shows the price variations for cowpeas purchased by consumers in Maputo and Nampula markets on the day of the interview and the previous week.

Table 3.9: Prices of cowpeas purchased by consumers in Maputo and Nampula today and last week

Price	Maputo		Nampula	
	Today	Last week	Today	Last week
PRC1	0	0	0	10
PRC2	5	0	15	20
PRC3	19	19	20	40
PRC4	29	28	40	20
PRC5	33	34	25	10
PRC6	14	19	0	0
Total	**100**	**100**	**100**	**100**

The prices of cowpeas purchased in Maputo on the day of the interview compared to the previous week remained more or less unchanged. The majority of respondents (33 and 34 percent respectively) reported that the price of cowpeas purchased fell in the PRC5 (6 500-7 500MT/kg) category.

The price of cowpeas in Nampula was higher on the day of the interview than the previous week.

In conclusion two observations emerge. The first is that prices of similar commodities differ quite substantially between the Maputo and Nampula markets and secondly, there is little variation in prices over the observed period, which could indicate relative stability in prices.

3.3.4 FREQUENCY OF PURCHASE OF BEANS AND COWPEAS AT MAPUTO AND NAMPULA

Figures 3.4 show the frequency by which traders purchase beans and cowpeas in Maputo and Nampula. For brown speckled beans and brown beans respectively, the majority of traders (43 and 60 percent) indicated that they purchased at markets in Maputo twice a month. In Nampula 42 percent of traders indicated that they purchase brown beans on a weekly basis, while 60 percent of traders purchase brown beans on a similar frequency. For cowpeas 30 percent of traders indicated that they purchased once a month in Maputo, while 51 percent indicated that they purchased once in six months at Nampula markets during the year.

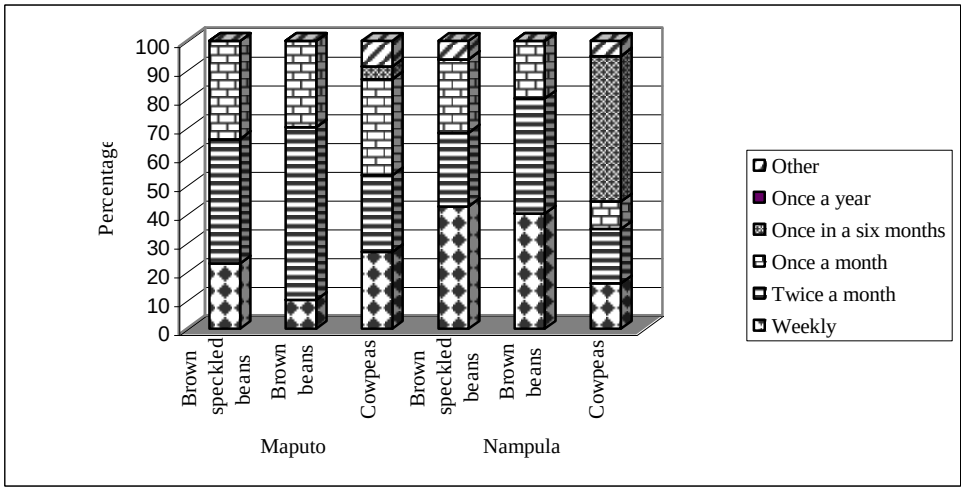

Figure 3.4: Frequency of purchases by traders of beans and cowpeas in Maputo and Nampula during the year

Figure 3.5 shows the frequency of purchases by consumers in Maputo and Nampula of brown speckled beans, brown beans and cowpeas during a month. Of the respondents, 53 percent of consumers in Maputo and 42 percent of consumers in Nampula indicated that they purchased brown speckled beans and brown beans twice a week. In Maputo while 54 percent of consumers indicated that they purchased cowpeas at the same frequency as beans. In Nampula, 46, 48 and 57 percent of respondents respectively indicated that they purchased brown speckled, brown beans and cowpeas twice a week.

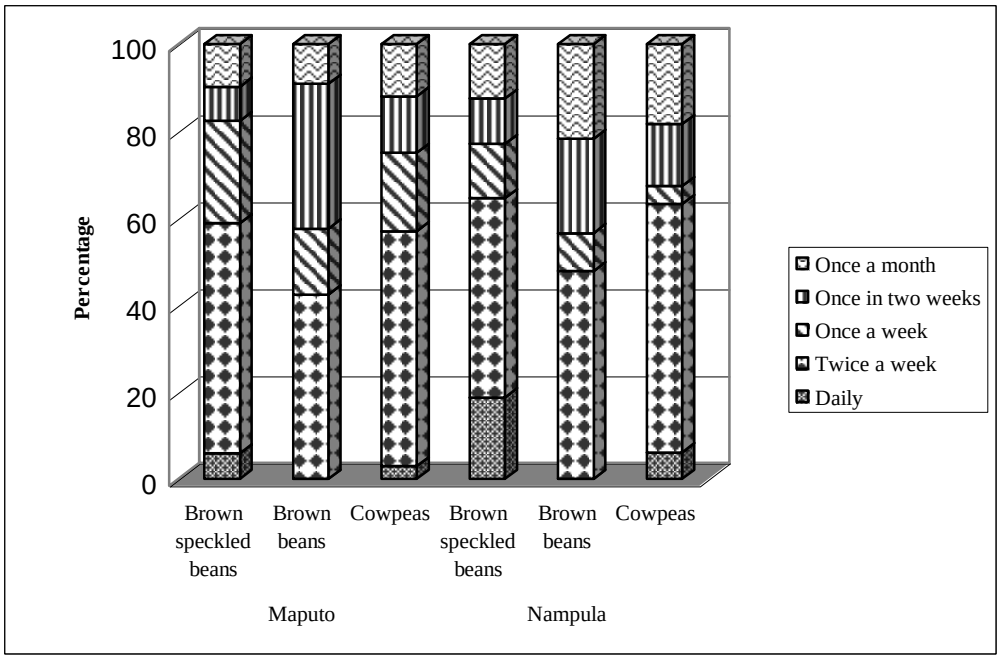

Figure 3.5: Frequency of purchase of beans and cowpeas by consumers in Maputo and Nampula during the month

3.3.5 SOURCES OF BEANS AND COWPEAS IN MAPUTO AND NAMPULA MARKETS

The sources of beans and cowpeas purchased in Maputo and Nampula markets by traders and consumers are shown in Tables 3.10 to 3.13. The study involved six categories of trading channels namely local wholesale (operating only in one city), national wholesale (operating on a much larger scale in the bean and

cowpea trade all over the country), transporters, rural markets, farm level and another category to be specified. None of the respondents indicated that the source of beans and cowpeas was national wholesalers in Maputo and Nampula. Tables 3.10 and 3.11 shows the sources of beans and cowpeas used by traders in Maputo and Nampula markets.

The results show that the majority of traders purchased beans and cowpeas from local wholesalers and to a lesser extent from rural markets and directly from farmers at Maputo markets (see Table 3.10).

Table 3.10: Sources of beans and cowpeas purchased by traders in Maputo

Source	n				%			
	Usually	**Often**	**Sometimes**	**Total**	**Usually**	**Often**	**Sometimes**	**Total**
Beans								
Local wholesalers	31	3	0	**34**	91	9	0	**100**
National wholesalers	0	0	0	**0**	0	0	0	**0**
Transporters	2	1	0	**3**	67	33	0	**100**
Rural markets	2	9	0	**11**	18	82	0	**100**
Direct from farmers	3	9	2	**14**	21	64	14	**100**
Cowpeas								
Local wholesalers	28	2	0	**30**	93	7	0	**100**
National wholesalers	0	0	0	**0**	0	0	0	**0**
Transporters	0	0	0	**0**	0	0	0	**0**
Rural markets	1	4	1	**6**	17	67	17	**100**
Direct from farmers	4	4	2	**10**	40	40	20	**100**

Table 3.11 shows that the majority of the traders in Nampula purchased beans mainly from 2 local wholesalers and transporters, which is different from the Maputo market. Moreover, transporters play a much more important role in the Nampula market.

Table 3.11: Sources of beans and cowpeas purchased by traders in Nampula

Source	n				%			
	Usually	**Often**	**Sometimes**	**Total**	**Usually**	**Often**	**Sometimes**	**Total**
Beans								
Local wholesalers	21	0	0	**21**	100	0	0	**100**
National wholesalers	0	0	0	**0**	0	0	0	**0**
Transporters	27	0	0	**27**	100	0	0	**100**
Rural markets	0	0	0	**0**	0	0	0	**0**
Direct from farmers	5	1	1	**7**	71	14	14	**100**
Cowpeas								
Local wholesalers	19	0	0	**19**	100	0	0	**100**
National wholesalers	0	0	0	**0**	0	0	0	**0**
Transporters	20	0	0	**20**	100	0	0	**100**
Rural markets	1	0	0	**1**	100	0	0	**100**
Direct from farmers	4	1	1	**6**	67	17	17	**100**

Tables 3.12 and 3.13 show the sources of beans and cowpeas purchase by consumers at Maputo and Nampula markets. Table 3.12 shows that the majority of respondents purchased brown speckled beans, brown beans and cowpeas from informal retailers, followed by informal wholesalers in Maputo markets. Few indicated that they purchased the three products from formal retail and roadside traders, while no respondents bought from formal wholesalers in Maputo.

Table 3.12: Sources of beans and cowpeas purchased by consumers in Maputo

Source	n			%		
	Brown speckled beans	**Brown beans**	**Cowpeas**	**Brown speckled beans**	**Brown beans**	**Cowpeas**
Informal retail	37	22	45	73	67	66
Formal retail	0	3	2	0	9	3
Roadside	1	2	2	2	6	3
Informal wholesalers	13	6	19	25	18	28
Formal wholesalers	0	0	0	0	0	0
Total	**51**	**33**	**68**	**100**	**100**	**100**

In Nampula, informal retailers and informal wholesalers were also the main sources of beans and cowpeas purchased by consumers (see Table 3.13).

Table 3.13: Sources of beans and cowpeas purchased by consumers in Nampula

Source	n			%		
	Brown speckled beans	**Brown beans**	**Cowpeas**	**Brown speckled beans**	**Brown beans**	**Cowpeas**
Informal retail	25	9	24	52	39	49
Formal retail	1	6	5	2	26	10
Roadside	9	0	8	19	0	16
Informal wholesaler	13	7	12	27	30	24
Formal wholesaler	0	1	0	0	4	0
Total	**48**	**23**	**49**	**100**	**100**	**100**

The results found little variation between markets and regions regarding the sources of beans and cowpeas purchased by traders and consumers. Although local wholesalers and transporters were the principal sources of beans and cowpeas purchased by traders in Maputo and Nampula, informal wholesalers

and informal retailers were the two main sources of beans and cowpeas for consumers in Maputo and Nampula. There was substantial evidence that large quantities of beans and cowpeas were marketed through informal trading agents at Maputo and Nampula markets. Wholesalers and trans-porters are the main intermediaries between farmers and other categories of trading agents and even consumers. They specialize in trading beans and cowpeas to a greater extent than retailers, and they operate on a medium and large scale and over the long distances between the northern and southern regions. Retailers generally buy beans and cowpeas from wholesalers and transporters to sell in small quantities in Maputo and Nampula.

3.3.6 TRADER AND CONSUMER PREFERENCES FOR BROWN SPECKLED BEANS AND BROWN BEANS AND COWPEAS IN MAPUTO AND NAMPULA MARKETS

Traders and consumers were asked a series of questions in order to gain an understanding of their preferences for beans and cowpeas and how these preferences translate to purchase decisions. Traders in Maputo and Nampula markets were asked about their preferences between different types of beans and cowpeas, while consumers were asked about thirteen characteristics of beans and cowpeas.

3.3.6.1 Traders' preferences for brown speckled beans, brown beans and cowpeas in Maputo and Nampula markets

Tables 3.13 and 3.14 present the traders' preferences for brown speckled beans, brown beans and cowpeas in Maputo and Nampula. (No one indicated red beans.) The majority of traders (61 percent) in Maputo who expressed a preference for brown speckled beans indicated that they found it very important. Only 7 and 11 percent reported that they never looked or they did not know, respectively.

Table 3.14: Traders' preferences for brown speckled beans, brown beans and cowpeas at Maputo market

Item	n			%		
	Brown speckled beans	**Brown beans**	**Cowpeas**	**Brown speckled beans**	**Brown beans**	**Cowpeas**
Extremely important	2	1	0	5	10	0
Very important	27	4	5	61	40	11
Medium important	0	0	8	0	0	18
Important	7	2	17	16	20	38
Not more important	0	0	2	0	0	4
Less important	0	0	0	0	0	0
Not important	0	0	0	0	0	0
Never look	3	1	2	7	10	4
I do not know	5	2	11	11	20	24
Total	**44**	**10**	**45**	**100**	**100**	**100**

In Nampula, 82 percent of traders reported that they regard brown speckled beans as important, to extremely important, while 3 and 15 percent indicated that they never looked or they did not know, respectively (See Table 3.14). For brown beans, the majority of respondents (47 percent) indicated that it was very important. Only 13 and 7 percent respectively indicated that they never looked or they did not know. Respondents who indicated that cowpeas were important and very important accounted for 38 and 32 percent respectively.

Table 3.15: Traders' preferences for brown speckled beans, brown beans and cowpeas in Nampula

Item	n			%		
	Brown speckled beans	**Brown beans**	**Cowpeas**	**Brown speckled beans**	**Brown beans**	**Cowpeas**
Extremely important	6	0	4	15	0	9
Very important	10	7	15	26	47	32
Medium important	0	0	2	0	0	4
Important	16	5	18	41	33	38
Not more important	0	0	0	0	0	0
Less important	0	0	0	0	0	0
Not important	0	0	0	0	0	0
Never look	1	2	2	3	13	4
I do not know	6	1	6	15	7	13
Total	**39**	**15**	**47**	**100**	**100**	**100**

Very few traders have considered the consumer's specific preferences for beans and cowpeas in the buying and selling strategies. This could indicate that consumer's specific preferences were considered in trading activities in Maputo and Nampula.

3.3.6.2 Consumers' preferences for brown speckled beans, brown beans at Maputo and Nampula markets

Consumers in Maputo and Nampula were asked about different quality attributes of beans and cowpeas that they considered before purchasing beans and cowpeas. The quality attributes were colour characteristics of beans and cowpeas (brown speckled beans, red beans, brown beans, dark black eyed cowpeas, and bright white testa cowpeas), damage levels for the beans and cowpeas (bruchid holes, discoloured beans and cowpeas, shriveled beans and cowpeas), and culinary characteristics for the beans and cowpeas (fast cooked

beans and cowpeas). The results of the analysis show that the majority of respondents indicated only colour and culinary characteristics as the most important quality attributes of beans and cowpeas.

3.3.7 CONSUMERS' WILLINGNESS TO PAY MORE FOR BEANS AND COWPEAS AT MAPUTO AND NAMPULA MARKETS

Tables 3.15 and 3.16 present information about consumers' willingness to pay more for specific grain characteristics of beans and cowpeas in Maputo and Nampula. The questions provided four possible responses, ranging from no premium to a willingness to pay a premium of more than 10 percent. Table 3.15 shows that the large majority of respondents are not willing to pay more than they are currently paying for different types of beans or for a bean that has a faster cooling time in Maputo. Similar results were obtained for cowpea characteristics listed. Similar results were also obtained for the Nampula market.

Table 3.16: Consumers' opinions regarding willingness to pay more for specific grain characteristics of beans and cowpeas in Maputo

Characteristic	n			%		
	I will not pay more	**Will pay up to 10% more**	**Total**	**I will not pay more**	**Will pay to 10% more**	**Total**
Beans						
Brown speckled beans	24	2	**26**	92	8	**100**
Brown beans	18	0	**18**	100	0	**100**
Fast cooking time	38	1	**39**	97	3	**100**
Cowpeas						
Dark black eye	0	0	**0**	0	0	**0**
Bright white testa	26	0	**26**	100	0	**100**
Fast cooking time	40	0	**40**	100	0	**100**

Table 3.17: Consumers' opinions regarding willingness to pay more for specific grain characteristics of beans and cowpeas in Nampula

Characteristic	n			%		
	I will not pay more	Up to 10% more	Total	I will not pay more	Up to 10% more	Total
Beans						
Brown speckled beans	21	2	**23**	91	9	**100**
Brown beans	14	2	**16**	88	13	**100**
Fast cooking time	29	3	**32**	91	9	**100**
Cowpeas						
Dark black eye	1	0	**1**	100	0	**100**
Bright white testa	25	0	**25**	100	0	**100**
Fast cooking time	23	0	**23**	100	0	**100**

3.3.8 DECISIONS MADE BY CONSUMERS BEFORE AND WHILE PURCHASING BEANS AND COWPEAS IN MAPUTO AND NAMPULA

Two questions were asked to understand the factors consumers considered before and while purchasing beans and cowpeas in Maputo and Nampula. The questions related to whether they planned beforehand what beans and cowpeas they wished to buy and, while buying, whether they looked for specific grain characteristics of beans and cowpeas (see Tables 3.17 and 3.18).

In response to the questions about planning what to buy before actually buying beans and cowpeas, 79 and 54 percent indicated that they planned before purchasing beans, while 21 and 46 percent indicated that they did not plan what beans to buy in Maputo and Nampula respectively. The same tendency was found for cowpeas, i.e. 72 and 45 percent of respondents indicated that they planned before purchasing cowpeas, while 28 and 55 percent reported that they did not plan their purchases in Maputo and Nampula, respectively (see Table 3.17).

Table 3.18: Decisions made by consumers before and while purchasing beans and cowpeas in Maputo and Nampula

Item	Maputo		Nampula	
	%		%	
	Beans	**Cowpeas**	**Beans**	**Cowpeas**
Yes	79	72	54	45
No	21	28	46	55
TOTAL	**100**	**100**	**100**	**100**

Regarding decisions made while selecting specific grain characteristics of beans and cowpeas, the majority of respondents (73 percent) reported that they always look for specific grain characteristics of beans while purchasing in Maputo. Of those who responded in Nampula, 42 percent indicated that they never looked for specific grain characteristics while purchasing beans.

For cowpeas, the majority of consumers who responded in Maputo (46 percent) always looked for specific grain characteristics of cowpeas while, in Nampula, 49 percent said that they never looked for specific characteristics when buying cowpeas (See Table 3.19). The results show little variation in consumers' decisions before and while purchasing beans and cowpeas for markets and regions. The majority of consumers reported that they planned before purchasing beans and cowpeas, as well as looking for specific grain characteristics.

Table 3.19: Decisions made by consumers while purchasing beans and cowpeas with specific characteristics in Maputo and Nampula

Item	Maputo		Nampula	
	%		%	
	Beans	**Cowpeas**	**Beans**	**Cowpeas**
Always	73	46	37	29
Occasionally	12	34	21	22
Never	15	21	42	49
TOTAL	100	**100**	**100**	**100**

3.3.9 MAPUTO AND NAMPULA TRADERS' OPINIONS REGARDING ACCESS TO CREDIT AND MARKET INFORMATION

Traders in Maputo and Nampula were asked to provide their opinions regarding access to credit and market information (see Table 3.19).

In response to the questions about access to credit, the majority of respondents (97 and 100 percent respectively) indicated that they did not have access to credit in Maputo and Nampula.

Table 3.20: Maputo and Nampula traders' opinions regarding access to credit and market information

Item	Maputo			Nampula		
	%			%		
	Yes	No	Total	Yes	No	Total
Access to credit						
Commercial bank	3	97	**100**	0	100	**100**
Credit cooperative	3	97	**100**	0	100	**100**
Other	0	100	**100**	1	99	**100**
Access to market information						
SIMA	40	60	**100**	0	100	**100**
Radio	21	79	**100**	63	37	**100**
Newspaper	5	95	**100**	1	99	**100**
Other	5	95	**100**	0	100	**100**

1) SIMA=Agricultural Market Information System

Regarding market information, the majority of respondents reported that they had no access to price and market information in Maputo and Nampula. A few traders (40, 21 and 5 percent respectively) indicated that they had access to prices via SIMA (Agricultural Market Information System), radio, newspapers, relatives and friends in Maputo, while 63 percent of the respondents indicated that they had access to market information via radio in Nampula.

3.4 CONCLUSION

The discussion in this chapter indicates that the quantity of beans and cowpeas demanded in Maputo and Nampula depended on the price and availability of the beans and cowpeas in the markets. The price of beans and cowpeas were higher in Maputo than in Nampula markets reflecting the distance between the two markets.

The bean and cowpea marketing system is also reflected in the limited information and credit. Most of traders obtained information regarding prices of beans and cowpeas from friends and relatives, some often listened to the radio in Maputo and Nampula. A credit constraint was reflected in their limited trading capacities and storage facilities. Holding stock of beans and cowpeas for more time is rare among informal traders particularly retailers in Maputo and Nampula.

CHAPTER 4
FACTORS INFLUENCING PURCHASE DECISIONS FOR BEANS AND COWPEAS IN SELECTED MOZAMBIQUE MARKETS

4.1 INTRODUCTION

Characteristics and/or attributes of the commodities play a significant role in the purchase decision of most consumers (Shepherd, 1989; and Lopez and Ramos, 1998). Langyintuo, Ntoukam, Murdock, Lowenberg-DeBoer and Miller (2004) in a study on cowpea characteristics in West Africa found that quality characteristics such as size of the grain and colour of the eye of cowpeas are important to consumers. Lowenberg-DeBoer (2004) observed that the main competitive advantage of Mozambican beans in Malawian markets is consumers' preferences for certain quality characteristics of beans, for instance, red beans are preferred in southern Malawi and khaki (sugar) beans are preferred in Lilongwe. It is clear that these preferences create market opportunities for beans in Mozambique and elsewhere.

In order to determine the factors that play an important role in consumer preferences regarding beans and cowpeas in selected markets in Mozambique, data gathered in Maputo and Nampula were analysed using a Logit model. The aim was to determine the probable effect of bean and cowpea attributes on consumers' decisions to purchase these products at the Maputo and Nampula markets.

4.2 REVIEW OF THE LITERATURE

Consumer preferences play a key role in the value chain. Producers and traders recognize that consumers' decisions to purchase influence their production and marketing decisions (Putnam & Allshouse, 2001). Consumer preferences are affected by several factors that are often difficult to predict, including cultural,

social, personal and psychological factors (Shepherd, 1989; Grunert *et al.,* 2000) (see Figure 4.1). It is clear that motivation to purchase depends on several individual and situational characteristics that affect different levels of the purchasing decision making process. Therefore individual socio-demographic and economic characteristics are commonly included as determinants of choice (Mowen, 1993; Alvensleben, 1997).

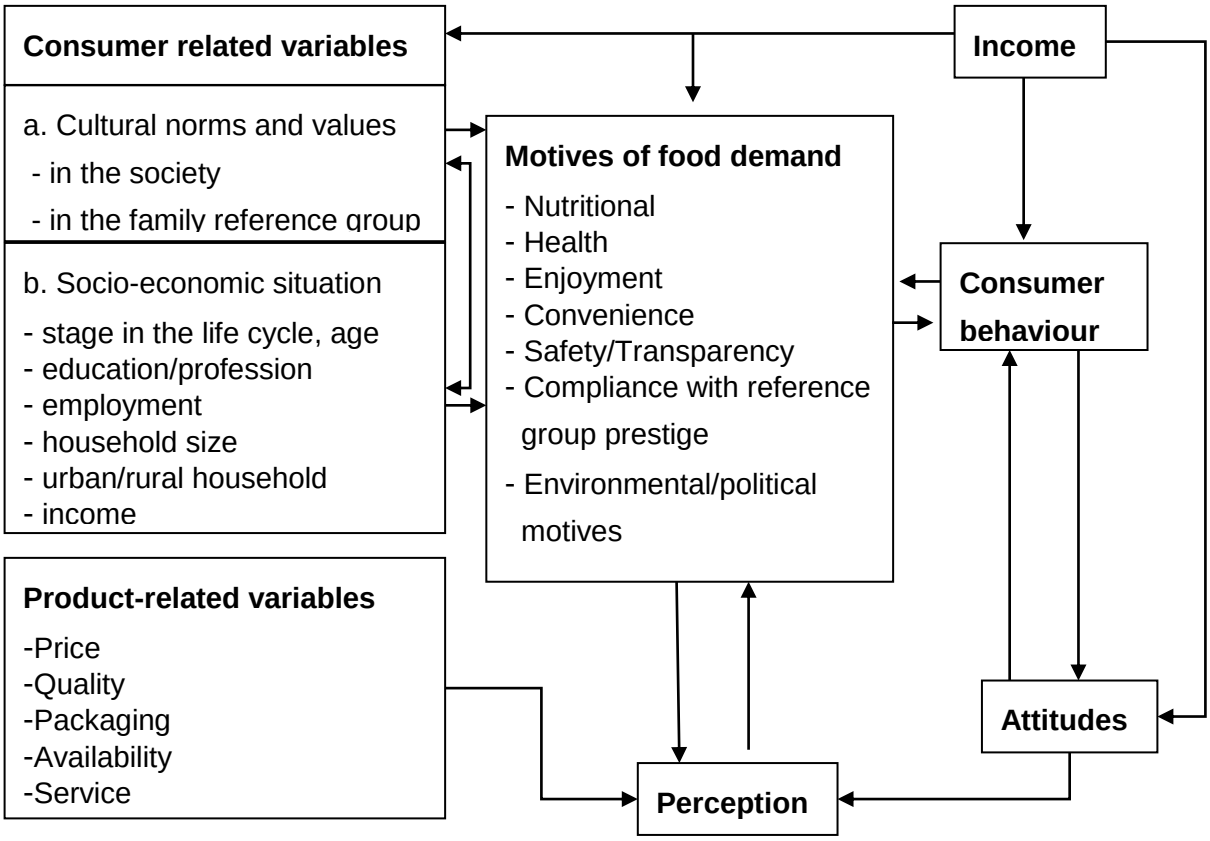

Figure 4.1: Some variables influencing food demand
Source: *Alvensleben (1997)*

According to Grunert, Hartvig-Larsen, Madsen and Baadsgaard (1996), a product is an aggregation of several characteristics and components referred to as product attributes, which consumers evaluate before making a decisions to purchase. Shepherd (1989) and Grunert *et al.* (2000) furthermore divide product attributes into intrinsic and extrinsic characteristics. The extended classification includes search attributes (price, colour and size of the grain), experience attributes (taste and flavour) and credence attributes (nutrition and health).

Monroe (1990), Rimal (2002) and Sibly (2002) argue that consumers judge the products on the basis of both price and quality characteristics to make their purchasing decisions. Sibly (2002) observes that consumer perceptions of price and quality are relative to preferred price and quality of the product. The preferred price and quality are compared to the actual price and quality to determine preference for the product.

Faye (2004) states that it is important, when analysing demand for a product, to bear in mind that consumers are not only purchasing the product, but that they are also purchasing the characteristics of the product that will provide utility. According to Sibly (2002), two kinds of utility can be associated with the purchase of a good. Firstly, “acquisition utility” represents the value of good relative to its price. Secondly, any purchase is also characterized by a “transaction utility”, which measures the “merits of deal”. It expected to be influenced by the preference of the consumer to purchase a product.

Spence (1975) assumes that consumers’ utility is based on not only the quantity and quality of the good consumed, but also on their preference for the good. When consumers’ utility depends on the level of preference, the consumer demand curve depends on price, characteristics of the good and preference. A decrease in preference means that consumers change the source of purchase, leave the market and purchase less (Sibly, 2002).

On the basis of theoretical utility model, demand for a product originates from the utility provided, which is as a function of its quality characteristics (Shepherd, 1989; Mowen, 1993; Balyamujura, 2001; Faye, 2004). The principle focuses on the utility of a product where a consumer tries to make choices maximizing his/her well-being. In other words, the utility function is a numerical representation of the consumer's preference to purchase a product (Grunert *et al.,* 2000).

The utility of an alternative is determined by a utility function, which consists of independent attributes characterizing the alternatives concerned and the relevant parameters (Misra, 2000). In accordance with this principle, it can be assumed that consumers of beans and cowpeas in Maputo and Nampula would be to maximise their expected utility. In line with Gensch and Recker (1979) and Sibly (2002), the utility maximisation function for the beans and cowpeas can be set as follows:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad (1)$$

$$P_{ij} = \frac{\exp^{(U_{ij})}}{\sum_{j=1}^{j=n} \exp^{(U_{ij})}} \qquad ((i = 1,.....,n) \quad (2)$$

where, U_{ij} is the utility expected to be maximised by the bean and cowpea consumer i in the market j, and n is the number of alternatives for the consumer to choose from. The utility function can be separated into a deterministic component V_{ij} (measured in terms of perceived value associated with attributes of the beans and cowpeas) and ε_{ij} (unobserved random component). The Logit model gives the probability P_{ij} that the bean and cowpea consumer will choose between a number of alternatives.

Several research studies have been conducted among farmers, traders and consumers into preferred market attributes of beans and cowpeas, and how these preferences are reflected in the market prices of different types of beans and cowpeas. Lowenberg-DeBoer and Filipe (2003) and Lowenberg-DeBoer (2004) observed that one of the opportunities in the bean market is consumers' preference for certain quality characteristics, particularly color and size of grains in Mozambique and Malawi. Faye, Ndiaye and Lowenberg-DeBoer (2000, quoted in Faye, 2004) indicate that size, colour and damage level of cowpeas are determinant attributes for consumer preferences for purchase in Senegal.

The consumer preferences relating to cowpeas that Langyintuo *et al. (*2003) refer to are seasonal supply (availability), size, color and damage to grains, which explains between 63 and 97 percent of price variability in selected markets in Cameroon, Ghana, Senegal and Nigeria. The authors also indicate that willingness to pay more for premium characteristics varied between 0.67 and 2.0 percent of the average price for each gram increase in 100 grain weight of cowpeas in the same markets.

Langyintuo *et al. (*2004) also concluded that quality characteristics of cowpeas (size and color of cowpeas, cowpea eye color and damage level) are significant in West Africa markets, particularly in Cameroon and Ghana. According to their results, most consumers in Cameroon and Ghana prefer large grain size cowpeas, and are willing to pay a premium of 1 to 2 percent of average cowpea price per gram increase in 100 grain weight. Besides cowpea eye color, consumers in Ghana paid premiums of up to 22 percent of the average cowpea price for black-eyed cowpeas, while consumers in Cameroon were discounted for black-eyed cowpeas

4.3 THE MODEL

As noted earlier, the main objective of this study is to estimate the probability that consumers will prefer a specific attribute of beans and cowpeas from a set of alternatives for their purchase decisions. Consumer preference for beans and cowpeas is an economic decision that involves choices among discrete alternatives. According to Sibly (2002) the Logit model will be appropriate for determining the probability of a consumer choosing an alternative from a set of alternatives to obtain maximum utility. It is assumed that a consumer of beans and cowpeas will choose an alternative with the highest utility from the set of alternatives (Gensch & Recker, 1979).

The Logit model is obtained by assuming that the maximization utility function is not totally deterministic, but contains a probabilistic term of a known statistical distribution (Gensch & Recker, 1979). This probabilistic term reflects the fact that part of the choice is not explainable by the analysis, for various reasons such as information availability, imperfect information on the options and lack of consumer confidence (Guadagni & Little, 1983; Hair, Anderson, Ronald & Black, 1998).

The following Logit model can be used to deal with aggregate data observed in the markets, such as characteristics and prices of beans and cowpeas (Long, 1997; Gensch, 1985; Guadagni & Little, 1983). According to Barnum and Squire (1979) (quoted in Haile, Alemu & Kudhlande, 2005) the common Logit model, in which the data sources will provide aggregate rather than individual observations, can be defined as follows.

$$\phi_i = \mathrm{E}(\gamma_i = 1/\mathrm{X}_i) = \frac{1}{1+\mathrm{l}^{-(\beta_i + \sum_i^k \beta_i \chi_i)}} \qquad (3)$$

Where ϕ_i stands for the probability of consumer i, γ_i is the observed consumer preference status of consumer i; χ_{ij} are factors determining the consume preference status for consumer i; and β_j stands for parameters to be estimated.

Denoting $\beta + \sum_{j=1}^{k=n} \beta_{ij}$ as Z, Equation (4) can be written to give the probability of preference of consumer i as:

$$\phi_i = \mathrm{E}(\gamma_i = 1/\mathrm{X}_i) = \frac{1}{1+e^{-\mathrm{Z}_i}} \qquad (4)$$

The Logit form also gives a plausible shape for the marginal effects. That is, for the continuous variable χ_{ij} at relatively high values, a marginal change will give a relatively smaller change in the probability of γ_i. From Equation (4), the probability of consumer preference is given by (1-ϕ_i), which gives Equation (5), which can be written as:

$$(1-\phi_i) = \frac{1}{1+e^{zi}} \tag{5}$$

Therefore the odds ratio, i.e., $\phi_i /(1-\phi_i)$ is given by Equation (6) as:

$$(\frac{\phi_i}{1-\phi_i}) = \frac{1+e^{zi}}{1+e^{-zi}} = e^{zi} \tag{6}$$

The natural logarithm of Equation (4) gives rise to Equation (7):

$$Ln(\frac{\phi_i}{1-\phi_i}) = \beta + \sum_{j=1}^{k=n} \beta_{ij} + \varepsilon_i \tag{7}$$

The dependent variable is the preference for beans and cowpeas. Like all regression methods, the resultant regression line is referred to as an ideal vector because the slope of the vector is the ratio of the preferences for the two dimensions. Rearranging Equation (7), with the dependent variable (consumer preference) in log odds, the logistic regression can be used to calculate conditional probabilities as:

$$\phi_i = \frac{e^{(\overline{\beta_o} + \sum_{i=1}^{k=n} \overline{\beta_j \chi_{ij}})}}{1+e^{(\overline{\beta_o} + \sum_{j=1}^{k=n} \overline{\beta_j \chi_{ij}})}} \tag{8}$$

Equation (8) gives the joint probabilities for each sample consumer. Thereafter "partial" effects of continuous individual variables on consumer preferences can be calculated by Equation (9).

$$\frac{\partial \phi_i}{\partial \chi_{ij}} = \phi_i (1-\phi_i)\beta_j \tag{9}$$

The partial effects of the discrete variables are calculated by taking the difference of the probabilities estimated when the value of the variable is set to 1 and 0, respectively where, $\chi_i = 1$ and $\chi_i = 0$.

4.4 DATA AND VARIABLES

The data set used in this study was part of a questionnaire survey of consumers conducted in Maputo (91 consumers) and Nampula (78 consumers). Only 60

questionnaires were usable due to a large number of respondents not showing any preference for certain characteristics.

This study analyzed principal factors affecting consumers' preferences for beans and cowpeas in Maputo and Nampula. Studies on consumer preferences pertaining to beans and cowpeas [e.g. Lowenberg-DeBoer & Filipe (2003), Lowenberg-DeBoer (2004), Faye, Ndiaye & Lowenberg-DeBoer (2000) (quoted in Faye, 2004), Langyintuo *et al. (*2003), and Langyintuo *et al. (*2004)] identified the various characteristics and/or attributes as determinants of purchasing beans and cowpeas. This study also include similar variables: damage levels (bruchid holes, discoloured and shriveled beans and cowpeas); and cooking time (rapid cooking beans and cowpeas). Furthermore, price, availability (supply) and quality (cleaned or no impurities) of beans and cowpeas were included in the analysis as other factors playing a key role in consumer preferences for beans and cowpeas. According to the descriptive analysis of the data in Maputo and Nampula and discussed in Chapter 4, most consumers in Maputo and Nampula markets distinguished five quality attributes of beans and cowpeas influencing their preferences. Consumers in Maputo (62 percent) and Nampula (62 percent) indicated strong preferences for brown speckled beans. Consumers in Maputo (53 percent) and Nampula (38 percent) reported that they preferred brown beans. Consumers in Maputo (44 percent) and Nampula (44 percent) reported preferences for bright white testa cowpeas, and consumers in Maputo (54 and 39 percent) and Nampula (41 and 39 percent) reported that they consider culinary characteristic (fast cooked beans and cowpeas, respectively).

In addition, consumers in Maputo (45 and 30 percent) and Nampula (100 and 90 percent) indicated that the price of beans and cowpeas, respectively, was the most important determinant for decisions to purchase beans and cowpeas, respectively. Furthermore, consumers in Maputo (86 and 92 percent) and Nampula (100 percent) reported that they considered availability of the product as an important determinant for their decisions to purchase beans and cowpeas,

respectively. Consumers in Maputo (63 and 75 percent) and Nampula (83 and 92 percent) paid considerable attention to the quality (cleaned or no impurities) of beans and cowpeas, respectively, when deciding whether to purchase.

The dependent variable for this study was consumers' decisions regarding the type of beans or cowpeas to purchase. Consumers who have preferences to purchase a specific type of bean and cowpea at a specific market were assigned a value of 1 and those who do not have preferences to purchase a specific type of beans and cowpeas at a specific market, were assigned a value of 0.

Due to the nature of the data obtained from the questionnaire characteristics such as colour, damage levels and cooking time were included in an aggregate manner. Price, availability (supply) and quality (cleaned or no impurities beans and cowpeas) were also included as explanatory variables of consumer preferences to purchase beans and cowpeas.

4.5 RESULTS AND DISCUSSION

4.5.1 PARAMETER ESTIMATES OF DETERMINANTS OF CONSUMER PREFERENCES

Table 4.1 shows the results of the logistic regression. Only two variables, price and quality characteristics were found to be significant and have the expected signs. Moreover, the results indicate that aggregate characteristics (colour and culinary characteristics of beans and cowpeas) and price will influence consumer decision to purchase beans and cowpeas at Maputo and Nampula markets.

Table 4.1: Parameter estimates of the logistic regression for the factor affecting consumer preferences for beans and cowpeas

Variables	Beans coefficients	Cowpeas coefficients
Constant	11.7060 ***	19.0175**
(Standard Error)	(6.3533)	(8.7253)
Characteristics	5.7675 *	6.5203*
(Standard Error)	(1.4098)	(2.2030)
Price	-.0010**	-.0030**
(Standard Error)	(.4938E-3)	(.001324)
Goodness of fit	88%	95%
Pesaran-Timmermann	5.9[.000]	6.6[.000]

** Significant at 1%; ** significant at 5%; *** significant at 10%*

4.5.1.1 Characteristics

Aggregate characteristics (colour and culinary characteristics of beans and cowpeas) are positively and significantly related to the probability of consumers' decisions to purchase beans and cowpeas. From this it can be postulated that the better informed consumers are about the quality characteristics of beans and cowpeas the higher is the probability that they will purchase these commodities. According to Haile *et al.* (2005), the change in the probability of consumer preferences due to a change in a significant discrete explanatory variable can be calculated by taking the difference of the mean probabilities estimated for the respective discrete variables $X_i = 0$ and $X_i = 1$. To calculate the partial effects $X_i = 0$ for consumers without information, while $X_i = 1$ for consumers that are well informed.

Table 4.2 shows that access to market information about the characteristics of beans and cowpeas defined by the shift from consumers without information about the characteristics of beans and cowpeas ($X_i = 0$) to consumers that are

well informed about the characteristics of beans and cowpeas ($X_i = 1$) increases the probability of consumers to purchase beans and cowpeas from 0.546 to 0.703 for beans and from 0.380 to 0.622 for cowpeas.

Table 4.2: Partial effects for characteristic determinants

	Beans		Cowpeas	
	Probabilities	Δ Probabilities	Probabilities	Δ Probabilities
Characteristics				
ϕ_0	0.546		0.380	
ϕ_1	0.703	0.157	0.622	0.242

ϕ_0 = Consumer without information about the characteristics of beans and cowpeas;

ϕ_1 = Consumer well informed about the characteristics of beans and cowpeas available in the markets

4.5.1.2 Price

Price has a negative and significant relationship with the probability of consumers to purchase beans and cowpeas.

Table 4.3 shows that a unit increase in price calculated in accordance with Haile *et al.* (2005), results in a decrease in the probability of consumer to purchase the selected commodities by 0.00024 for beans and 0.000045 for cowpeas.

Table 4.3: Partial effects for price determinants

Variable	Beans partial effect	Cowpeas partial effect
Price	-0.00024	-0.000045

4.6 CONCLUSION

Various previous studies on bean and cowpea markets in Africa showed that consumers are sensitive towards the attributes of beans and cowpeas when making a decision to purchase these commodities. In this chapter the factors that influence consumers' decisions to purchase beans and cowpeas in selected Mozambican markets was investigated with a Logit model. Factors included in the analysis were commodity attributes, price and availability. Due to the nature of the data characteristics of the commodities were aggregated into a characteristics variable.

The analysis yielded significant results for the characteristics and price variables. The results obtained for the characteristics variable suggest that should beans and cowpeas have the characteristics that consumers want it will increase the consumption thereof. The analysis also shows that if more information is available on characteristics the probability of consumers to purchase beans and cowpeas will increase.

As expected the price variable has a negative correlation with consumption, i.e. a price increase will result in lower consumption.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

Beans and cowpeas are cultivated by the majority of smallholders in Mozambique, traditionally for home consumption and increasingly for income by rural households, particularly in the northern part of the country. In Mozambique marketing systems for beans and cowpeas are limited and poorly organized. Improving the marketing of these products should promote production and trade in the country. Knowledge on consumers' preferences for specific grain characteristics of beans and cowpeas should create market opportunities on local and regional markets. Findings of several studies on beans and cowpeas in Africa indicate that systematic and adequate information about consumers' preferences for quality characteristics of beans and cowpeas is important, not only for trade, but also for improving bean and cowpea production and marketing systems. To ensure that varieties of beans and cowpeas produced in Mozambique meet the quality preferences of consumers, market information is essential. The flow of information about consumers' preferences back, through retailers or other trading agents, to farmers as well as research institutions, constitute a valuable input relating to improving the production of beans and cowpeas in Mozambique.

The primary objective of this study was to investigate the impact of different bean and cowpea characteristics on the probability of consumers to purchase these products. Hence the focus of the study is primarily on the demand chain for beans and cowpeas. A Logit model was used to estimate the probability that consumers will prefer a specific attribute of beans and cowpeas. In addition, price and volume variables are also considered.

5.2 CONCLUSIONS

5.2.1 BEANS AND COWPEA PRODUCTION IN MOZAMBIQUE

Beans and cowpeas are cultivated mainly by smallholder farmers, mostly during the rainy season under rain-fed conditions. Beans are grown as a sole crop or an intercrop with other crops like maize or cassava. Beans are adapted to sandy to dense soils, but perform best on deep loams which are well drained. Cowpeas, erect and prostrated varieties are grown as sole crop and/or intercropped with maize and cassava. It is grown throughout the country on a wide range of soils, but shows a preference for sandy soils.

Mozambican bean production has increased since the early 1990s and production reached 191 300 tons in 1997/1998, mainly in the northern and central regions, but experienced a large decline in the 1999/00 season, with lower production in the central and southern regions, probably due to drought and the disaster flooding in the region in 2000. Although the national average of bean production has increased, the yield is relatively low.

Problems experienced by producers and marketers, and which can be associated directly with the marketing of beans and cowpeas, are small and dispersed production units, inadequate crop varieties, low volumes and marketable surpluses subject to variability and fluctuations associated with rainfall, pests and diseases, poor quality of the crops and lack inputs.

5.2.2 BEAN AND COWPEA TRADE

The Mozambican marketing system handles relatively little of the total beans and cowpeas produced in the country, mainly because the marketing channels available to bring the product from farmers to consumers are limited. Trade is

conducted mainly by informal and formal traders who sell beans and cowpeas in rural and urban areas. The potential market for beans in Mozambique and its neighbouring countries in southern Africa could be improved by marketing organizations, which would allow alliances among producers, traders and consumers.

5.2.3 BEAN AND COWPEA PRICES

In general nominal prices for beans showed an increasing trend for both commodities. Interesting to note is that the price spread for cowpeas is a lot larger than for beans. The nominal retail price of beans followed a similar trend to that of the wholesale market. Poor infrastructure and road contributes to the gap between prices of beans in the north and the south. Similar trends were observed for cowpeas.

5.2.4 QUALITATIVE SURVEY RESULTS

The volumes of beans and cowpeas purchased are higher in Maputo and Nampula's wholesale markets than in retail markets. Wholesalers operate on a much larger scale than retailers. The higher volumes sold by wholesalers could probably be explained by the fact that they handle large quantities of the product and hence can offer better prices when necessary. In addition, their price does not include a retail profit margin as would be the case for retailers.

The majority of retailers at Maputo and Nampula markets usually sell brown speckled beans, brown beans and cowpeas in small quantities, such as 500 g and 1 kg tins. In Maputo and Nampula, informal wholesalers often sell brown speckled beans and brown beans in quantities of up to 20 kg.

The survey revealed that beans and cowpeas were more expensive in Maputo than in Nampula market. Differentials in inter-regional price variations are due to

many factors. High food prices in Maputo region reflect the transportation costs of transferring the products from production areas (generally the northern and central regions of Mozambique), over long distances, under poor road conditions, to the consumption areas.

The results of the survey show that the majority of respondents indicated only colour and culinary characteristics as the most important quality attributes of beans and cowpeas.

Access to credit and information by traders and consumers are very poor with compounds the problems to create an efficient marketing system.

5.2.5 FACTORS INFLUENCING PURCHASE DECISIONS FOR BEANS AND COWPEAS IN SELECTED MOZAMBIQUE MARKETS

The factors that influence consumers' decisions to purchase beans and cowpeas in selected Mozambican markets were investigated with a Logit model.

Aggregate characteristics (colour and culinary characteristics of beans and cowpeas) are positively and significantly related to the probability of consumers' decisions to purchase beans and cowpeas. From this it can be postulated that the better informed consumers are about the quality characteristics of beans and cowpeas the higher is the probability that they will purchase these commodities. Improved access to market information about the characteristics of beans and cowpeas will increases the probability of consumers to purchase beans and cowpeas from 0.546 to 0.703 for beans and from 0.380 to 0.622 for cowpeas.

Price has a negative and significant relationship with the probability of consumers to purchase beans and cowpeas.

5.3 RECOMMENDATIONS

5.3.1 MARKET INFRASTRUCTURE

Mozambique's geography constitutes the issue of market infrastructure particularly pertinent to the bean and cowpea market. The most productive areas for beans and cowpeas are the northern and central parts, but these regions are separated from the main consumption areas by long distances, poorly maintained roads and the high cost of transportation. This results in excessive costs for supplying beans and cowpeas to the central and southern parts of the country (key consumption centers), very low prices to producers and high transaction costs.

Rural roads, transportation and communication are crucial to small farmers' access to markets, especially those that reside in remote or inaccessible areas (Castano, 2004; Kherallah *et al.* 2001). Minten (1999) in an analysis linking the price variation to structural determinants, found that market infrastructure is an important determinant of producer price levels. He also found that the price levels decrease with distance to main roads and decrease significantly as the quality of infrastructure decreases. Hence, through public-private partnerships serious attention needs to be given to infrastructure deficiencies if the market it to operate in an efficient manner to play its right full role in economic growth and poverty alleviation.

5.3.2 MARKET INFORMATION

Traders and other participants in the bean and cowpea market in Mozambique have limited access to market information about prices and market demand. According to this survey, most traders in Maputo and Nampula indicated

personal contacts as the main source of information about prices and regulations affecting their businesses.

Accurate, appropriate and timely market information is important to all stakeholders in the bean and cowpea marketing chain (including input suppliers, producers, transporters and traders). Information helps farmers and traders balance supply and demand at markets and eliminate inaccurate calculation of marketing costs (Castano, 2004). If farmers can compare a price offered by one trader with another elsewhere, traders will tend to offer fair prices (Kluste, 2004). According to Kherallah *et al.* (2001), farmers need more and better market information for informed production and marketing decisions. Access to better information will enable traders to reduce their business risks and to operate profitability on lower margins. Consumers, in turn, can also be influenced by market information. Consumers must have reliable and accurate information in order to make their decisions to purchase beans and cowpeas. The study showed that improved access to information will increase the probability of consumers to purchase beans and cowpeas, which will have beneficial impacts on other role players in the respective chains.

In Mozambique, there are several official and non-official sources of market information that traders can consult, e.g. census, survey, experimental researchers and reports. However market information is not always accessible or systematic. Market information services need to be established at local, regional and national levels to gather, process and disseminate the information in the languages of intended beneficiaries. The effect of the lack of market information is twofold. On the one hand, it increases market imperfection, erratic price variations, and risk and uncertainly to producers and other participants in the market. On the other, it leads to ineffective decision-making and policies, and may cause a reverse effect on production and marketing of beans and cowpeas.

5.3.3 CREDIT AND FINANCIAL SERVICES

Credit constraints are common to all types of traders, both formal and informal, in Mozambique. Traders and other marketing participants in Mozambique don't have facilities to access credit for their marketing operations. Most commercial banks are reducing their lending to the agricultural sector, and those that are able to borrow money do so at high interest rates, aggravated by inflation and over short repayment periods (usually within a year). Few non-bank finance or micro finance institutions are active in the rural sector, because most of them have experienced poor recovery rates on agricultural loans and are reluctant to increase their risk exposure. The majority of traders rely on family and friends to secure credit for their businesses. The credit constraints are reflected by their limited purchasing and storage capacity. Government, together with the private sector, should investigate ways and means to increase access to credit by market intermediaries in the bean and cowpeas supply chains.

5.3.4 CREATION OF COLLECTIVE MARKETING ALLIANCES

In Mozambique, small-scale farmers are mainly subsistence farmers. They face many problems, including transport difficulties in the rural areas, small quantities of beans and cowpeas produce, lack of credit and inadequate storage facilities. Production units are dispersed with low levels of income, savings, and capital. Purchase of inputs and sales of outputs are in small quantities and vary widely by season (Cardoso, 2000; Bias & Donovan, 2003). These factors limit the access to markets and marketing systems of beans and cowpeas for farmers.

Collective marketing strategies and the creation of strategic alliances between traders and farmers could increase small-scale farmers' participation in the bean and cowpea markets in Mozambique. Abbott (1987) believes that farmers' associations enable small farmers to economize on transport to distant outlets,

undertake initial marketing strategies and increase their bargaining power. According to Abbott (1993) conditions favouring associations are:

- Specialized producing areas distant from their major markets;
- Concentration upon and homogeneity of farm production market;
- Groups of farmers dependent on one or few crops for their total income;
- Availability of local leadership and management;
- Motivated members.

The evidence suggests that there are benefits associated with collective organization that can be realized by farmers or/and traders. Collective marketing has many advantages, such as sharing of market risks and benefits (L'Hoir *et al.,* 2002; Abbott, 1993). Recently, the Co-operative League of the USA (CLUSA) and CARE International worked with farmers' associations to build partnerships and alliances to improve access to markets, particularly in northern Mozambique. The experience made it possible for farmers' associations to close commercial contracts for their produce at more competitive prices than would have been possible individually (CLUSA, 2004). Other relevant examples are the cases of coffee cooperatives in Kenya, India's dairy sector, and coffee and cotton processing cooperatives in Uganda (Abbott, 1993).

5.4 AREAS FOR FURTHER RESEARCH

- In this study commodity characteristics were considered on aggregate. Given that the aggregation variable was significant justifies that further analysis is conducted on specific attributes that will command a premium in the market place.
- Credit has been pointed out as limiting the ability of role players to participate efficiently in the market. Research is necessary to determine the most effective ways to provide access to credit.

REFERENCES

Abbott, J.C. 1987. Agricultural marketing enterprises for the developing world. Cambridge: Cambridge University Press.

Abbot, J. 1993. Agricultural and food marketing in developing countries: selected readings. Great Britain: C.A.B International

Allen, D.J., Dessert, M., Trutman, P. and Voss, J. 1989. Common beans in Africa and their constraints. In H.F. Schwartz & M.A. Pastor-Corrales (eds.). Bean production problems in the Tropics, 2nd ed. Cali, Columbia: CIAT.

Alvensleben, R. 1997. Consumer behavior. Agro-food marketing, pp.209-224. Wallingford: CAB Publishing.

Arlindo, P. and Tschirley, D. 2003. Regional trade in maize in Southern Africa: Examining the experience of northern Mozambique and Malawi. Policy Synthesis. Paper no.67. May 2003.

Arndt, C., Schiller, R. and Tarp, F. 2001. Grain transport and rural credit in Mozambique: Solving the space-time problem. *Agricultural Economics* 25: 59-70.

Balyamujura, H.N. 2001. Marketing tea for Uganda's smallholder sector. PhD Dissertation. Department of Agricultural Economics. University of the Free State.

Bias, C. and Donovan, C. 2003. Gaps and opportunities for agricultural sector development in Mozambique. Research paper No. 54. Ministry of Agricultural and Rural Development. Directorate of Economics. Republic of Mozambique.

Branson, R.E. and Douglas, G.N. 1983. Introduction to agricultural marketing. New York: INC.

Cardoso, M.J. 2000. Small-scale food processing sector in Mozambique. Imani Development & Austral. CTA Working Document No. 83013. Mozambique.

Castano, J. 2004. Agricultural marketing systems and sustainability: Study of small scale Andean Hillside farmers. Manshott Graduate School. Hollandseweg 16706 Wageningen. The Netherlands.

Carrilho, J., Benfica, R., Tschirly, D. and Boughton, D. 2003. Qual e o papel da agricultura familiar comercial no desenvolvimento rural e reducao da pobreza em Mocambique? Relatorio no. 53 P. 14 de Julho de 2003. MADER/MSU. Republica de Mocambique.

CLUSA (Cooperative League of the United State of America), 2004. Personnal communication. CLUSA, Nampula, Mozambique.

Cotteril, R.W. and Westgren, R.E. 1994. Strategic marketing in food industries. *Agribusinesses*, 10(5): 431-441.

Dinar, A. 1996. Extension commercialisation: How much to charge for extension services. *American Journal of Agricultural Economics* 78 (1996): 1-12.

DNC/MIC (Direccao Nacional de Comercio/Ministerio de Industria e Comercio). 2001. Feiras e mercados rurais na Zambezia e a sua promocao. Nota de pesquisa de DNC 19. Maputo. Mocambique.

Faye, M.D. 2004. Investigation of key aspects for the successful marketing of cowpeas in Senegal. PhD Thesis. Department of Agricultural economics. University of the Free State. Bloemfontein. South Africa.

Food and Agricultural Organization of the United Nations (FAO). 2004. FAO Statistical Data Base. http://apps.fao.org/

Gensch, D. H., 1985. Empirical testing a disaggregate choice model for segments. *Journal of Marketing Research*, Vol. 25: 462-467, 1985.

Gensch, D.H. and Recker, W.W. 1979. The multinomial multiattribute Logit Choice Model. *Journal of Marketing Research*, Vol. 16: 124-132 (1979).

Grunert, K.G., Hartvig-Larsen, H., Madsen, T.K., Baadsgaard, A. 1996. Market orientation in food and agriculture. Boston: Kluwer. USA.

Grunert, K.G., Bech-Larsen, T., T., Bredahl, L. 2000. Three issues in consumer quality perception and acceptance of dairy products. *International Dairy Journal*, 10, 575-584.

Guadagni, P. and Little, J.D.C. 1983. A Logit Model of brand choice calibrated on scanner data. Marketing Science, Vol. 2: 203-238, 1983.

Barnum, H.H. and Squire, L. 1980. Predicting agricultural output response. *Oxford Economic Papers*, New Series, Vol. 32, No. 2, 284-295

Haile, H.K., Alemu, Z.G., and Kudhlande, G. 2005. Causes of household food insecurity in Koredegaga peasant association, Oromiya Zone, Ethiopia. University of the Free State. South Africa.

Hair, J. F., Anderson, R.E., Ronald, L.T., and Black, W.C. 1998. Multivariate analysis. 5th ed., Prentice-Hall, 1998.

INE/MADER (Instuto Nacional de Estatistica e Ministerio da Agricultura e Desenvolvimento Rural). 2001. Censo agro-pecuario (CAP), 1999-2000: Apresentacao sumaria dos resultados: quadros e graficos. Maputo.

Ismail, A.M. and Hall, A.E. 1998. Positive and potential negative effects of heat-tolerance genes in cowpea. *Crop Science,* 38:381-390.

Jooste, A. 2004. Bean study. External Market Task Force Paper. February 2004.

Kherallah, M., Minot, N., Kachule, R., Soule, B.G., and Berry, P. 2001. Impact of agricultural market reforms on smallholders farmers in Benin and Malawi. IFPRI Collaborative Research project. Project No. 97.7860. 6-001.00. Final Report submitted to GTZ.

Langyintuo, A.S., Lowenberg-DeBoer, J., Faye, M., Lambert, D., Ibro, G., Moussa, B., Kergna, A., Kushwaha, S., Musa, S., and Ntoukam, G. 2003. Cowpea supply and demand in West and Central Africa. *Field Crop Research,* 82 (2003): 215-231.

Langyintuo, A.S., Ntoukam, G., Murdock, L., Lowenberg-DeBoer, J. and Miller, D.J. 2004. Consumer preferences for cowpea in Cameroon and Ghana. www.elsier.com/locate/agecon.

L'Hoir, C., Goddard, E., Ng, D. and Lerohl, M. 2002. Preferences about marketing organic grain in Alberta. Project report: 02-05. Department of Rural Economy. Faculty of Agriculture & Forestry and Home Economics. University of Alberta. Edmonton, Canada.

Long, J.L. 1997. Regression models for categorical and limited dependent variables. Sage Publications: Advanced Quantitative Techniques in the Social Science Series 7.

Lopez, R.A. and Ramos, H.H. 1998. Supply response and demand for basic grains in El Salvador. *Agribusiness*, Vol.14, No. 6 (1998), 475-481.

Lowenberg-DeBoer, J. 2004. Estimating supply and demand for beans and cowpeas in Africa. Bean/Cowpea Collaborative Research Support Program-funded by USAID. Bean/Cowpea CRSP Paper.

Lowenberg-DeBoer, J. and Filipe, M.D. 2003. Trip report Malawi and Mozambique, May30-June 14, 2003. Bean/Cowpeas CRSP. Purdue University. Department of Agricultural Economics.

MacDonald, J.M. 2000. Concentration in agribusiness. Agricultural Outlook Forum 2000. Economic Research Service. US Department of Agriculture.

MAP (Ministerio da Agricultura e Pescas). 1996. Inqueritos agricolas ao sector familiar: 1993 e 1994. Resultados definitivos. Republica de Mocambique, Ministerio da Agricultura e Pescas, DEA/Departamento de Estatistica.

Minten, B. 1999. Infrastructure, market access, and agricultural prices: Evidence from Madagascar. Market and Structural Studies Division. IFPRI.

Misra, S.K. 2000. The role of product and market characteristics in determining Cottonseed prices. *Agribusiness*. Vol.16. No. 3, 357-366.

Ministerio da Agricultura / Michigan State University. 1993. Mini-SIMA e Analise Especificas: Um ensaio aplicado aos mercados de Maputo. Relatorio Preliminar de Pesquisa No. 15, 15 de Julho de 1993.

Monroe, K.B. 1990. Pricing: Making profitable decisions. Second edition: McGraw-Hill, Boston, Massachussetts.

Mowen, J.C. 1993. Consumer behavior. New York: MacMillan Publishing.

Okamoto, I. 2004. Agricultural marketing reform and rural economy in Myanmar: The successful side of the reform. Institute of Developing Economies, JETRO. Paper presented at the Parallel Session II, “Reform in Agriculture : Country Experiences from Asia”. GDN the 5th Conference, 28th, January, 2004.

Paton, J. 2002. Aspects of developing pulse production in Mozambique (Pigeon pea in Nampula and Zambezia districts). A report for Africa Technical Families (Private Sector Development and SME Departments), World Bank and Technoserve, Mozambique.

Penzhorn, N. and Arndt, C. 2002. Maize markets in Mozambique: Testing for market integration. *Agrekon*, Vol 41, No 2 (June 2002).

Putnam, J. and Allshouse, J.L. 2001. Food consumption, prices, and expenditures, 1970-97. Food and Rural Economics Division, US. Department of Agriculture. Statistical Bulletin N0. 965.

Rimal, A.P. 2002. Factors affecting meat preferences among American consumers. *Family Economics and Nutrition Review*. Vol.14 No.2, pp.36-43.

Santos, A.P., Paulo, A., Miguel, A., Abdula, D., Arlindo, P. and Nhane, S. 2001. Confirmada baixa producao de cereais e feijoes no norte de Mocambique e no Malawi: Implicacoes sobre as exportacoes para Malawi e os precos ao produtor. Flas 26p. MADER/DE/DEST. 9 de Augusto. Mocambique.

Shepherd, R. 1989. Factors influencing food preferences and choice. In R.Shepherd (Ed.), Handbook of psychophysiology of human eating (pp. 1-30).

Shirkhantha, 2004. Personnal communication. Marketing manager, Export Marketing Enterprise, Nampula, Mozambique.

Sibly, H. 2002. Loss averse customers and price inflexibility. Journal of Economic Phsychology, 23, pp. 521-538.

SIMA (Sistema de Informacao de Mercados Agricolas). 2004. Monthly price information of beans and cowpeas. SIMA-MSU/MADER, Mozambique.

SNAP (Sistema Nacional de Aviso Previo). 2002. Relatorio: Situacao da campanha agricola 2001/2002, estimativas da superficie cultivada e producao das culturas alimentares, e areas perdidas e familias afectadas pela estiagem. Sistema Nacional de Aviso Previo para Seguranca Alimentar SNAP)/DINA/ MADER. Maputo. Mocambique.

Spence, A.M. 1975. Monopoly, quality and regulation. *Journal of Agricultural Economics*, pp. 417-429.

Tickner, V. 1997. Rural trade in Mozambique: Pre-feasibility study central and northern provinces. Publications on Agriculture and Rural Development No. 5, Dept. for Natural Resources and the Environment. SIDA, Stockholm.

Timmer, C.P. and Alderman, H. 1979. Estimating consumption parameters for food policy analysis. *American Journal of Agricultural Economics* 61(1979): 984-87.

Tschirley, D., and Santos, A.P. 1998. Desafios para garantir a concorrencia e reduzir os custos no sistema alimentar de Mocambique. MAP/MSU Relatorio de pesquisa No. 28. Direccao de Economia, Ministerio de Agricultura e Pescas, Maputo.

Tschirley, D., Thom, J., Mukumbu, M., Chisvo, M., Weber, M.T, Zulu, B., Johansson, R., Santos, P. and Soroko, D. 2000. Successes and challenges of food market reform: Experiences from Kenya, Mozambique, Zambia, and Zimbabwe. Policy Synthesis 39. East Lansing. Michigan State University, February.

World Bank. 2002. World Bank Development Indicators, 2001. Washington, DC. World Bank.

ADDENDUMS

ALL INFORMATION PROVIDED WILL BE TREATED AS STRICTLY CONFIDENTIAL

"AN INVESTIGATION INTO THE DEMAND CHAIN FOR BEANS IN MOZAMBIQUE": QUESTIONNAIRE FOR CONSUMERS

PART A: GENERAL INFORMATION

A1. LOCATION			
Put the **[code]** in the appropriate box for location.	Maputo	1	
	Nampula	2	

A2. MARKET	***Market***				
Put the **[code]** in the appropriate box for the market.	Maputo		Bazuca	1	
			Xipamanine	2	
	Nampula		Faina	3	
			Muhala	4	

A3. DATE							
Put the date in the appropriate boxes.	Date of interview						

PART B: PRODUCT FLOW

	B1.What quantity of beans/cowpeas do you usually buy? **Quantity Code:** Tin 500 g =1 Tin 1 kg =2 Tin 10 kg =3 Tin 20 kg =4 Other =5 Put the **[CODE]** in the appropriate **BOX** for each crop FOR THE MOST IMPORTANT ITEMS.			B2. What price did you pay for beans/cowpeas today? **Quantity code:** Tin 500 g = 1 Tin 1 kg = 2 Tin 10 kg = 3 Tin 20 kg = 4 Other = 5 Put the **[CODE]** in the appropriate **BOX** for each crop. And the **[PRICE]** FOR THE MOST IMPORTANT ITEMS.		
B.1.1.a	***Beans***	Code	***B.2.1.a***	***Beans***	Code	**B.2.1.b** Price (MT)
G	Brown speckled beans			Brown speckled beans		□□□□□□□□
H	Red beans			Red beans		□□□□□□□□
I	Brown beans			Brown beans		□□□□□□□□
J	Other, specify:			Other, specify:		□□□□□□□□
B.2.2.a	***Cowpeas***	Code	***B.2.2.b***	***Cowpeas***	Code	**B.2.2.b** Price (MT)
L	Cowpeas			Cowpeas		□□□□□□□□

	B3.What price did you pay for beans/cowpeas last week? **Quantity Code:** Tin 500 g =1 Tin 1 kg =2 Tin 10 kg =3 Tin 20 kg =4 Other =5 Put the **[CODE**] in the appropriate **BOX** for each crop. And the **[PRICE]** FOR THE MOST IMPORTANT ITEMS.				B4. How often do you buy beans/cowpeas during the month? **Frequency code:** Daily = 1 Twice a week =2 Once a week =3 Once in two weeks = 4 Once a month =5 Put the **[CODE**] in the appropriate **BOX** for each crop. And the **[QUANTITY PURHASED]** FOR THE MOST IMPORTANT ITEMS.		
B.3.1.a	***Beans***	Code	**B.3.1.b** Price (MT)	***B.4.1.a***	***Beans***	Code	**B.4.1.b** Quantity
G	Brown speckled beans		□□□□□□□□	G	Brown speckled beans		□□□□□
H	Red beans		□□□□□□□□	H	Red beans		□□□□□
I	Brown beans		□□□□□□□□	I	Brown beans		□□□□□
J	Other, specify:		□□□□□□□□	J	Other, specify:		□□□□□
B.3.2.a	***Cowpeas***	Code	**B.2.2.b** Price (MT)	***B.4.2.a***	***Cowpeas***	Code	**B.4.2.b** Quantity
L	Cowpeas		□□□□□□□□	L	Cowpeas		□□□□□

	B5. How often do you buy beans/cowpeas during the season? **Frequency code:** Weekly = 1 Once in a month = 2 Once in three months = 3 Once in six months = 4 Once in the season = 5 Put the **[CODE]** in the appropriate **BOX** for each crop FOR THE MOST IMPORTANT ITEMS.			B6. Where do you buy beans/cowpeas most often during the past month? **Item code:** Informal retail = 1 Formal retail = 2 Roadside = 3 Informal wholesaler =4 Formal wholesaler =5 Put the **[CODE]** in the appropriate **BOX** for each crop FOR THE MOST IMPORTANT ITEMS.		
B.5.1.a	***Beans***	Code	**B.6.1.a**	***Beans***	Code	
G	Brown speckled beans	G		Brown speckled beans		
H	Red beans	H		Red beans		
I	Brown beans	I		Brown beans		
J	Other, specify:	J		Other, specify:		
B.5.2.a	***Cowpeas***	Code	**B.6.2.a**	***Cowpeas***	Code	
L	Cowpeas	L		Cowpeas		

	B7a. Before purchasing do you plan what beans/cowpeas you want buy? **Item code:** Yes = 1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____			B7b. While buying for beans/cowpeas do you look for specific grain characteristics? **Item code:** Always = 1 Occasionally = 2 Never =3 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____	
B.7.a.1	***Crops***	Code	***B.7.b.1***	***Crops***	Code
Zc	Beans		Zc	Beans	
B.7.a.2			***B.7.b.2***		
L	Cowpeas		L	Cowpeas	

	B8a. How important are your specific preferences for beans in the market? **Item code:** Much very important = 9 Very important = 8 Medium important = 7 Important = 6 Not more important = 5 Less important = 4 Not important = 3 Never look =2 I do now = 1 Put the **[CODE]** in the appropriate **BOX** FOR THE MOST IMPORTANT CHARCTERISTICS.				B8b. How important are your specific preferences for cowpeas in the market? **Item code:** Much very important = 9 Very important = 8 Medium important = 7 Important = 6 Not more important = 5 Less important = 4 Not important = 3 Never look =2 I do now = 1 Put the **[CODE]** in the appropriate **BOX** FOR THE MOST IMPORTANT CHARCTERISTICS.		
B.8.a	***Characteristics of beans***		Code	***B.8.b***	***Characteristics of cowpeas***		Code
G	Colour	Brown speckled beans		Zh	Colour	Dark black eye	
H		Red beans		Zi		Bight white testa	
I		Brown beans					
Zd	Damage levels	Bruchid holes		Zj	Damage levels	Bruchid holes	
Ze		Discoloured beans		Zl		Discoloured cowpeas	
Zf		Shrivelled beans		Zm		Shrivelled cowpeas	
Zg	Cooking time	Fast cooking time		Zn	Cooking time	Fast cooking time	

	B9a. How much more over the current price would you be wiling to pay for beans that have your favourite characteristics? **Item code:** I will not pay more = 1 1% to 10% more = 2 11% to 20% = 3 More than 20% = 4 Put the **[CODE]** in the appropriate **BOX f**or the most important characteristic of beans.				B9b. How much more over the current price would you be wiling to pay for cowpeas that have your favourite characteristics? **Item code:** I will not pay more = 1 1% to 10% more = 2 11% to 20% = 3 More than 20% = 4 Put the **[CODE]** in the appropriate **BOX** for the most important characteristic of cowpeas.		
B.9.a	***Characteristics of beans***		Code	***B.9.b***	***Characteristics of cowpeas***		Code
G	Colour	Brown speckled beans		Zh	Colour	Dark black eye	
H		Red beans		Zi		Bright white testa	
I		Brown beans					
Zd	Damage levels	Bruchid holes		Zj	Damage levels	Bruchid holes	
Ze		Discoloured beans		Zl		Discoloured cowpeas	
Zf		Shrivelled		Zm		Shrivelled cowpeas	
Zg	Cooking time	Fast cooking time		Zn	*Cooking time*	Fast cooking time	

	B10a. What is your opinion about the beans sold in the market? **Frequency code:** Very good = 1 Good = 2 Poor = 3 Very poor = 4 I do not know = 5 Put the **[CODE**] in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____			B10b. What is your opinion about the cowpeas sold in the market? **Frequency code:** Very good = 1 Good = 2 Poor = 3 Very poor = 4 I do not now = 5 Put the **[CODE**] in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____	
B.10.a		Code	***B.10.b***		Code
Q	Price of beans		Zo	Price of cowpeas	
R	Availability of beans		Zp	Availability of cowpeas	
S	Quality of beans		Zq	Quality of cowpeas	
U	Other, specify:		Zr	Other, specify:	

PART C: CHARACTERISTICS OF THE CONSUMER

C.1	*Put the [code] in the appropriate box for gender.*		***GENDER***		
			Female	1	
			Male	2	

C.2	*Put the [code] in the appropriate box for age.*		***AGE***		
			Less 20 years	1	
			21-35 years	2	
			36-45 years	3	
			46-55 years	4	
			Over 56 years		

C.3	*Put the [code] in the appropriate box for marital status.*		***MARITAL STATUS***		
			Single	1	
			Married	2	
			Separated	3	
			Divorced	4	
			Widower	5	
			Other	6	

C.4	*Put the [code] in the appropriate box for residence.*		***RESIDENCE***		
			Urban	1	
			Suburban	2	
			Rural	3	

C.5	*Put the [code] in the appropriate box for education.*		***EDUCATION***		
			None	1	
			Grades 5 and lower	2	
			Grades 6-7	3	
			Grades 8-10	4	
			Grades 11-12	5	

ALL INFORMATION PROVIDED WILL BE TREATED AS STRICTLY CONFIDENTIAL

"AN INVESTIGATION INTO THE DEMAND CHAIN FOR BEANS IN MOZAMBIQUE": QUESTIONNAIRE FOR TRADERS

PART A: GENERAL INFORMATION

A.1. LOCAION			
Put the [code] in the appropriate box for location.	Maputo	1	
	Nampula	2	

A.2. MARKET					
Put the [code] in the appropriate box for the market.	Maputo		Bazuca	1	
			Xipamanine	2	
	Nampula		Faina	3	
			Muhala	4	

A.3. TYPES OF TRADERS				
Put the [code] in the appropriate box for type of trader.		Wholesaler formal	1	
		Wholesaler informal	2	
		Retailer	3	
		Road side	4	

A.4. DATE							
Put the date in the appropriate boxes.	Date of interview						

PART B: PRODUCT FLOW

	B1. From whom do you usually purchase your beans and cowpeas? **Frequency Code:** Usually (51-100%) =1 Often (26-50%) =2 Sometimes (1-25%) =3 Never (0%) =4 Put the **[CODE]** in the appropriate **BOX** FOR THE MOST IMPORTANT ITEMS for each crop.			B2. How often do you purchase beans and cowpeas during the year and how much? **Frequency code:** Weekly = 1 Twice a month =2 Once a month = 3 Once in six months = 4 Once a year = 5 Other =6 Put the **[CODE]** in the appropriate **BOX** and the **[QUANTITY PURCHASED]** FOR THE MOST IMPORTANT ITEMS for each crop.		
B.1.1.a	***Beans***	Code	***B.2.1.a***	***Beans***	Code	**B.2.1.b** Quantity
A	Local Wholesaler		G	Brown speckled beans		□□□□□□
B	National Wholesaler		H	Red beans		□□□□□□
C	Transporters		I	Brown beans		□□□□□□
D	Rural markets (e.g. Faires)		J	Other, specify:		□□□□□□
E	Direct from farmers at their farmers					
F	Other, specify:					
B.1.2.a	***Cowpeas***	Code	***B.2.2.a***	***Cowpeas***	Code	**B.2.2.b** Quantity
A	Local Wholesaler		L	Cowpeas		□□□□□□
B	National Wholesaler					
C	Transporters					
D	Rural markets (e.g. Fairs)					
E	Direct from farmers at their farmers					
F	Other, Please specify:					

	B3.What price do you pay for the beans and cowpeas purchased? **Quantity Code:** Tin 500 g =1 Tin 1 kg =2 Tin 10 kg =3 Tin 20 kg =4 Other =5 Put the **[CODE**] in the appropriate **BOX a**nd the **[PRICE]** FOR THE MOST IMPORTANT ITEMS for each crop.				B4. What quantity of beans do customers usually buy? **Quantity code:** Tin 500 g = 1 Tin 1 kg = 2 Tin 10 kg = 3 Tin 20 kg = 4 Other = 5 Put the **[CODE**] in the appropriate **BOX** FOR THE MOST IMPORTANT ITEMS for each crop.		
B.3.1.a	***Beans***	Code	**B.3.1.b** Price (MT)	***B.4.1.a***	***Beans***	Code	
G	Brown speckled beans		□□□□□□□□	G	Brown speckled beans		
H	Red beans		□□□□□□□□	H	Red beans		
I	Brown beans		□□□□□□□□	I	Brown beans		
J	Other, specify:		□□□□□□□□	J	Other, specify:		
B.3.2.a	***Cowpeas***	Code	**B.3.2.b** Price (MT)	***B.4.2.a***	***Cowpeas***	Code	
L	Cowpeas		□□□□□□□□	L	Cowpeas		

	B5.What is the price of beans and cowpeas you are selling today? **Quantity Code:** Tin 500 g =1 Tin 1 kg =2 Tin 10 kg =3 Tin 20 kg =4 Other =5 Put the **[CODE**] in the appropriate **BOX a**nd the **[PRICE]** FOR THE MOST IMPORTANT ITEMS for each crop.				B6. Do you regularly purchase adequate beans and cowpeas for the market demand? C**ode:** Yes = 1 No = 2 Put the **[CODE**] in the appropriate **BOX** FOR THE MOST IMPORTANT ITEMS for each crop. PROVIDE REASON FOR EACH ANSWER.		
B.5.1.a	***Beans***	Code	**B.5.1.b** Price (MT)	***B.6.1.a***	***Beans***	Code	
G	Brown speckled beans		□□□□□□□□	G	Brown speckled beans		
H	Red beans		□□□□□□□□	H	Red beans		
I	Brown beans		□□□□□□□□	I	Brown beans		
J	Other, specify:		□□□□□□□□	J	Other, specify:		
B.5.2.a	***Cowpeas***	Code	**B.5.2.b** Price (MT)	***B.6.2.b***	***Cowpeas***	Code	
L	Cowpeas		□□□□□□□□	L	Cowpeas		

	B7. What is the price you sold beans . and cowpeas last week? **Quantity code:** Tin 500 g = 1 Tin 1 kg = 2 Tin 10 kg = 3 Tin 20 kg = 4 Other = 5 Put the **[CODE**] in the appropriate **BOX a**nd the **[PRICE]** FOR THE MOST IMPORTANT ITEMS for each crop.				B8. How do you get the beans you buy to the market? **Item code:** Lorry = 1 Pickup (LDV) = 2 Delivered at the market = 3 Other =4 Put the **[CODE**] in the appropriate **BOX** FOR THE MOST IMPORTANT ITEMS for each crop.		
B.7.1.a	***Beans***	Code	**B.7.1.b** Price(MT)	***B.8.1.a***	***Beans***	Code	
G	Brown speckled beans		□□□□□□□□	G	Brown speckled beans		
H	Red beans		□□□□□□□□	H	Red beans		
I	Brown beans		□□□□□□□□	I	Brown beans		
J	Other, specify:		□□□□□□□□	J	Other, specify:		
B.7.2.a	***Cowpeas***	Code	**B.7.2.b** Price(MT)	***B.8.2.a***	***Cowpeas***	Code	
L	Cowpeas		□□□□□□□□	L	Cowpeas		

	B9a. How important are the consumer's specific preferences for beans in the market? **Item code:** Much very important = 9 Very important = 8 Medium important = 7 Important = 6 Not more important = 5 Less important = 4 Not important = 3 Never look =2 I do now = 1 Put the **[CODE**] in the appropriate **BOX** FOR THE MOST IMPORTANT CHARACTERISTICS of beans.			B 9b. How important are the consumer's specific preferences for cowpeas in the market? **Item code:** Much very important = 9 Very important = 8 Medium important = 7 Important = 6 Not more important = 5 Less important = 4 Not important = 3 Never look =2 I do now = 1 Put the **[CODE**] in the appropriate **BOX** for the cowpeas.		
B.10.a	***Characteristics of beans***	Code	***B.10.b***	***Characteristics of cowpeas***		Code
G	Brown speckled beans		L	Cowpeas		
H	Red beans					
I	Brown beans					
J	Other, specify:					

B10. What is your opinion about the transportation conditions from beans/cowpeas purchase point to the market?

Frequency code:

Very good = 1
Good = 2
Poor = 3
Very poor = 4
I do not know = 5

Put the **[CODE**] in the appropriate **BOX** for each item.
PROVIDE REASON FOR EACH ANSWER.

_____

_____

_____

B11. What is your opinion about the beans or cowpeas are you selling?

Frequency code:

Very good = 1
Good = 2
Poor = 3
Very poor = 4
I do not now = 5

Put the **[CODE**] in the appropriate **BOX** for each item.
PROVIDE REASON FOR EACH ANSWER.

_____

_____

_____

B.11		Code	***B.12***		Code
M	Conditions of beans when they arrive		Q	Price of beans	
N	Cost of transport		R	Availability of beans	
O	Distance of place of purchase		S	Quality of beans	
P	Other, specify:		T	Package of beans	
			U	Other, specify:	

	B12a. In your opinion are there a large enough variety of beans available from the source you buy from? **Item code:** Yes = 1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____			B12b. In your opinion are there a large enough variety of cowpeas available from the source you buy from? **Item code:** Yes = 1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____	
B.13.a	***Beans***	Code	***B.13.b***	***Cowpeas***	Code
G	Brown speckled beans		L	Cowpeas	
H	Red beans				
I	Brown beans				
J	Other, specify:				

	B13a. Would you consider increase the quantity of beans you sell in the market? **Item code:** Yes = 1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____			B13b. Would you consider to increase the quantity of cowpeas you sell in the market? **Item code:** Yes =1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____	
B.14.a	***Beans***	Code	***B.14.b***	***Cowpeas***	Code
G	Brown speckled beans		L	Cowpeas	
H	Red beans				
I	Brown beans				
J	Other, specify:				

	B14a. Do you wish to expand your beans business to new market? **Item code:** Yes = 1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____			B14b. Do you wish to expand your beans business to new market? **Item code:** Yes =1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. PROVIDE REASON FOR EACH ANSWER. _____ _____ _____	
B.15.a	***Beans***	Code	***B.15.b***	***Cowpeas***	Code
G	Brown speckled beans		L	Cowpeas	
H	Red beans				
I	Brown beans				
J	Other, specify:				

	B15. Do you use any credit to purchase beans/cowpeas? **Item code:** Yes = 1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. IF "YES", NAME THE SOURCE.			B16. Have you heard or read any news report about beans/cowpeas price or other market information in last week/month? **Item code:** Yes =1 No = 2 Put the **[CODE]** in the appropriate **BOX** for each item. IF "YES", NAME THE SOURCE.	
B.16	***Credit Source***	Code	***B.17***	***Information source***	Code
V	Commercial Bank		Y	SIMA (Agricultural Market Information)	
W	Credit Cooperative		Z	Radio	
X	Other, specify:		Za	Newspapers	
			Zb	Other, specify:	

PART C: CHRACTERISTICS OF THE TRADER

C.1	*Put the **[code]** in the appropriate box for gender.*		***GENDER***		
			Female	1	
			Male	2	

C.2	*Put the **[code**] in the appropriate box for age.*		***AGE***		
			Less 20 years	1	
			21-35 years	2	
			36-45 years	3	
			46-55 years	4	
			Over 56 years		

C.3	*Put the **[code]** in the appropriate box for marital status.*		***MARITAL STATUS***		
			Single	1	
			Married	2	
			Separated	3	
			Divorced	4	
			Widower	5	
			Other	6	

C.4	*Put the **[code]** in the appropriate box for residence.*		***RESIDENCE***		
			Urban	1	
			Suburban	2	
			Rural	3	

C.5	*Put the **[code]** in the appropriate box for education.*		***EDUCATION***		
			None	1	
			Grades 5 and lower	2	
			Grades 6-7	3	
			Grades 8-10	4	
			Grades 11-12	5	