# DRIVERS OF TRADER PARTICIPATION IN BEAN AND COWPEA MARKETING

by

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## ABSTRACT

Beans and cowpeas are considered nutritionally dense and good sources of protein. In this sense, they are considered excellent food in poor households, especially in those that exhibit high levels of malnutrition or under-nutrition. To address food security and nutrition security in poor countries, there has been an increasing interest in encouraging farmers to grow beans and cowpeas. This has spurred research in value chains for these crops in many countries, especially those that do not traditionally grow them as primary staples. Most of these research efforts have focused on the producer and consumer issues, with little or no attention paid to traders who operated between these two players in the value chain. The objective of this study, therefore, is to contribute to the literature on the bean and cowpea value chain research by identifying the factors influencing the participation decisions of traders in this segment of the agricultural economy in Zambia. Using data collected by the Pulse Value Chain Initiative – Zambia in 2011, a probit model was used to analyze data. The dependent variable trader participation in wholesale marketing of beans and cowpeas in Lusaka and its principal food markets. The explanatory variables encompass trader demographic characteristics and available assets or resources. The research explored the effect of the assets or resources on the choice to trade cowpeas or beans at the wholesale level in Lusaka with and without controlling for traders' demographic characteristics.

Three procurement sources are identified in the study: the local market within which the traders operate; producers/suppliers within Lusaka District; and producers/suppliers outside Lusaka District. The results indicate that the procurement

source for beans and cowpeas influenced trader decision to operate at the wholesale level. For example, traders who purchased their produce from locations outside Lusaka District were about 37% more likely to participate in wholesale trade compared to those sourcing their produce within the market in which they operate when demographic characteristics of traders are not controlled for in the model. When the demographic factors are controlled, the likelihood of those procuring from outside Lusaka District participating in the wholesale trade declines slightly to about 34%. These coefficients were both statistically significant at the 1 percent level. The results also showed that traders using credit from friends and family were nearly 18% less likely to participate in wholesale trade than those borrowing from other traders, significant at the 5% level. Controlling for demographic characteristics led to a reduction of this likelihood to about 16.7%, significant only at the 10% level.

There were no statistical differences between traders for all education levels and those without any education except for respondents with lower primary and lower secondary education. Traders with lower primary and lower secondary education had a 31% higher likelihood of operating at the wholesale level compared to those without any formal education while those with upper secondary education had about 26.7% higher likelihood of operating at the wholesale level compared to those without any formal education. Marital status was not a discriminant in the decision to operate at the wholesale level. However, males had about a 9% higher probability than females in operating at the wholesale level.

Wholesalers tend to move larger volumes of produce and, hence, create wealth much quickly than retailers.  Wholesalers are also more likely to be engaging processors when these exist in the supply chain.  Given that traders sourcing their produce from outside Lusaka District are more likely to engage in wholesale trading, it recommended that further research into the intricate characteristics of these traders are explored.  This future research will do well to explore the factors that specifically differentiate these traders from the others.  Understanding these and their potential effects could allow policymakers to provide support and services to this class of traders to engage in structured relationships with larger organizations such as processors and exporters.

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**CHAPTER I: INTRODUCTION**

**1.1 Background**

Agriculture accounts for about 20.2% of Zambia's GDP (Factbook 2012).

However, the proportion of the population aged 12 years or older working in the

agricultural sector is about 66.5% (Census of Population National Analytical Report,

2013). Agriculture encompasses crops and livestock production and crops include the

production of food crops cereals such as maize and rice, root crops such as cassava, and

pulses such as groundnuts, beans and cowpeas, as well as cash crops such as tobacco and

cotton. Maize is by far the most important crop in Zambia. It was cultivated by more than

86% of Zambian households in 2011/2012 agricultural year (Central Statistics Office,

2011). This compares to only 15.7% of households growing mixed beans.

The large proportion of households growing maize is not an accident. The crop is a

major staple in Zambia. As a result, it has benefitted from policy initiatives that have

supported its cultivation as a way to minimize the risk of famine and enhance food security.

For example, maize has received significant government subsidies (Chiwele, Muyatwa

Pumulo and Kalinda 1998). In recent years, there has been policy redirection with a focus

on liberalizing the agricultural sector. These reforms have contributed to the removal of

maize subsidies and the possibility of market forces influencing farmers' resource

allocation decisions. These new policies, unlike the previous ones that did not embrace

private sector participation, thereby failing to foster sustainable agricultural development

(FNDP, 2006-10), may actually contribute to the development of sustainable production in

Zambian agriculture.

A potential beneficiary of the changing agricultural policy environment is the pulse and legume industry.  Pulses are produced in all parts of Zambia, although about 83% are produced in four of the ten Provinces (PVCI, 2010). Pulses are an area of interest because they are an excellent source of proteins and good nutrition. In fact, dry beans are the most important legume for direct food consumption (Jones, 2007). In 2006, according to the Zambia Demographic Health Survey (CSO 2007), the prevalence of malnutrition was high, with 28% of under-five children being underweight and 45% of them stunted. According to the "Nutrition at a Glance" program for Zambia, stunting is 45% (WorldBank 2013). The nutritional and other characteristics of dry beans, cowpeas and other pulses have supported the development of a strong consumer market in Zambia.  For many poor families, understanding the nutritional qualities of pulses provide a strong rationale for their consumption given that it is a good protein sources and becomes "the poor man's meat." The strengthening demand has led to an increasing production of the crop; from 5.6% to 6% from 1998 to 2008 (PVCI, 2011).  Farmers are also becoming more aware of the nitrogen fixing capability of pulses and are incorporating them into their traditional cropping activities to boost production of other crops, such as maize.

The foregoing explain the increasing importance of these crops in Zambia over the past several decades.  Cowpeas, for example, are an important food legume in Zambia due to their adaptability to drier regions like Southern Province, where they are widely produced. Besides their significance in providing food for the household, cowpeas are also shade tolerant and, thus, play a significant role in inter-cropping with crops like maize and cotton for subsistence farmers. Unlike cowpeas, beans have been historically important

constituent in Zambian diets, often incorporated into maize meals to enhance palatability and improve nutritional quality. These crops also provide a risk management option for many producers who plant them because they provide nitrogen to support other crops when producers have difficulty supplying the requisite quantity of nitrogen fertilizer needed.

## 1.2 Statement of the problem

Agricultural producers depend extensively on traders in getting their produce to market. Unfortunately, these traders are often seen as taking advantage of producers because of the high levels of market information asymmetry that often exists between producers and traders. Despite this, the important role these traders play in getting produce to market in the service of both producers and consumers cannot be overemphasized. Traders may choose to operate at the retail level, thus purchasing produce in smaller quantities and selling them directly to consumers and such customers as small restaurants, or choose to operate at the wholesale level, purchasing in larger quantities from numerous producers and marketing to retailers as well as larger restaurants, processors, institutions and exporters. Understanding the factors that influence a trader's decision to operate at the wholesale level is important because of the embedded advantages of scale economies that wholesale traders have in the marketplace. They are, for example, able to negotiate better transportation services and costs because they offer transporters larger volumes of business. They are also able to secure storage facilities in the rural areas from where they procure their produce and in the urban areas where they sell. Because of their size, wholesalers are also able to perform retailing role sometimes when it becomes necessary for them to operate in the retail market.

Modernization of value chains is inevitable due to the increase in demand with increased income and population growth over the years, which have induced modern marketing channels and distribution systems (Narayanan and Walker 2010). Studies by Nkonya (2002) in Uganda focused on characteristics of traders and the crop market, determining why traders produce a particular crop compared to coffee. This study gave a good overview of trader characteristics yet it did not explore specific value chain constraints and opportunities of each crop. Focusing on a particular crop will inform decision makers about its value chain, its constraints and existing opportunities, including the players involved. For example since liberalization in Zambia, there is more focus on the maize market whose value chain characteristics are significantly different from those of beans and cowpeas because it has a well-developed value chain. Therefore, the need to categorize such research according to crop type is very important.

To inform policy reforms about agricultural value chains, studies have been done to determine significance of smallholder participation in various crops. For example, there have been research determining beans and cowpeas producers' characteristics, their marketing channels and some of the factors influencing their marketing choices in Zambia (Zulu 2011; Samboko 2011; Mzyece 2011; and Ngoma, 2011). The distribution of value along the bean supply chain has been studied by Mwansa (2013) but he did not differentiate traders into their different classes. Increasing our knowledge about traders will increase understanding about current demand and supply issues, help discover more market options that will benefit producers and traders, as well as provide in-depth information on consumer satisfaction.

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**1.3 Objectives**

The overall objective of this study is to identify drivers of trader participation in wholesale trading of beans and cowpeas.  The specific objectives are as follows:

1) To determine the influence of trader assets and resources on their choice to operate exclusively at the wholesale level in the bean and cowpea supply chain

2) To determine the influence of trader demographic characteristics on their decision to participate exclusively at the wholesale level in the bean and cowpea supply chain.

**1.4 Justification**

The world's poorest people live in Sub-Saharan Africa which Zambia is a part of (Jones 2013). Zambia's agricultural industry accounts for 66.5% (Census of Population National Analytical Report, 2013) and 72% of the people employed (FAO 2013). However, the employment of resources, such as land, has been very inefficient because of the fragmented nature of agricultural production resulting from the smallholder ownership characteristics of producers.  Additionally, road and other infrastructure needed to move products from production centers – in rural communities – that are significantly far from urban areas where consumption centers – in urban communities – are poor.  Tis increases transportation costs for moving products to market, sometimes leading to loss of significant proportion of total agricultural production in these poor countries. Smallholder farmers are among the world's poorest people especially those with low productivity and low market participation (Rios, Masters and Shively 2008). According to Rios et al (2008), increasing either productivity or market participation will increase the other and boost the standard of

living for farmers. Increasing market participation will increase opportunities for improved access to market information and incentives for farmers to in turn use for production and improve their livelihoods.

Research on market participation of key supply chain players is critical for the Zambian economy particularly in the pulse industry where information is very scanty (Laan 1999). In particular, research on trader participation is important for providing more insight on existing specialty markets, opportunities for exports and also challenges faced beyond the farm along the bean and cowpea supply chains. Results of this study will contribute to the body of knowledge that currently exists on supply chain participation, profitability and challenges in the pulse industry. In addition, these results may have bearing on the public regulation of the pulse industry by informing policy makers of the critical role that bean and cowpea traders play in this industry. As a result, more attention will be given to the pulse value chain so that the industry is developed as much as the maize value chain, thereby being beneficial to supply chain players as well as the economy as a whole.

## 1.5 Outline of the Thesis

This thesis will review literature done by different scholars, including the theoretical framework of trader market participation. It will then outline the methods and procedures taken to collect data, identify outliers and analyze it. Next, the thesis will discuss the findings and finally conclude and give recommendations.

**CHAPTER II: LITERATURE REVIEW**

This chapter will review literature about underlying marketing of crops, including pulse crops, following studies that have been done by different scholars in the past. The review will detail findings on marketing of beans and cowpeas as the focus of the study, and issues that have been identified. It will further review the factors that influence producers and traders to participate in crop marketing, also highlighting the characteristics of these key players. Finally, the theory underlying the decision to participate in marketing of a crop and utility maximization will be reviewed.

## 2.1 Definition of terminologies

According to Wikipedia (2013), a supply chain is a system of organizations, people, activities, information, and resources involved in moving a product or service from the supplier to the consumer. Supply chains are an important aspect of the marketing process because they are composed of processes that transform raw material into finished products that the end user/customer makes use of. The Zambia Ministry of Agriculture has defined two supply chains in their simplistic forms; (i) farmer-trader-consumer; and (ii) farmer-consumer. In the former, the trader travels to the farm to purchase a product and travels back to the urban area to sell it to the consumer (MACO 2004). In the latter, the consumer travels to the farm or the farmer travels to sell directly to the consumer in a physical market location. These supply chains can get more sophisticated with involvement of processors, and traders who are wholesalers selling to retailers.

According to Porter (1989), a value chain is a set of activities that an organization carries out to create value for its customers. Porter's value chain focuses on systems and how inputs are transformed into outputs that customers purchase. In looking at these

various activities, Porter relates them to the overall competitive advantage of the organization rather than simply looking at it as a combination of machinery, people and money. In this vein, it evaluates which value each activity adds to each organization's products and services (Recklies 2001).

## 2.2 Cowpea and bean marketing

According to Jari (2009), the actors in many crop value chains in Africa are smallholder producers, consumers, farm gate retailers, local retailers, middlemen/brokers, urban consumers, foreign traders and foreign consumers. Smallholder producers sell directly to rural consumers or to farm gate traders who sell to local traders who also sell to middlemen who sell to urban consumers or to foreign traders (Jari 2009)**.** Adejobi (2005), in Nigeria where cowpeas are an important food reserve crop for the government, that the key players in the cowpea chain are producers, trans-border farmers, rural retailers, urban wholesalers, urban retailers and consumers. Wholesalers and retailers bought cowpea either directly from producers (who form the largest group) or from the Northern region where their conditions were met (Adejobi 2005).

According to an assessment of the profitability of smallholder cowpea producers in Zambia, a paper that examined cowpea profitability in Zambia and some of the factors that influence its profitability, average gross margin was found to be positive. Data were obtained from the Central Statistics Office (CSO) and the Food Security Research Project (FSRP) and it showed that yield, production costs, land tenure systems and size of area planted, affect cowpea profitability (Zulu 2011). The report shows that even though the effect of transaction costs is negative, yields and farm gate price have a positive influence on cowpea profitability and more farmers should be encouraged to produce them.

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A productivity and profitability analysis of cowpea was done in the Kaduna State in Nigeria, where input and output data of cowpeas was collected. The analysis shows that the cowpea in Nigeria is profitable and the various inputs used are significant to influencing cowpea output except fertilizer application (Adeola et al 2011). In addition, the combined input effect also had a positive effect on cowpea profitability. It was discovered, however, that these inputs were being under-utilized and if put to proper use can further widen gross margins of cowpeas.

Gross margins for beans are usually positive and actually obtain higher prices compared to some pulses such as soybeans. Higher returns have worked even better for producers who have contracts to sell their beans than those engaged in direct marketing. Beans have economic costs such as transportation, cost of seed, spraying and post-harvest costs, as compared to soybeans for example (Myers 2012).

Research shows mixed results in evaluations of factors influencing bean profitability of bean production in Zambia. Samboko (2011) showed that the level of producer profitability is determined by the type of buyer of the beans. The analysis shows that those producers who sold to private traders and consumers outside their district made profit, while those that sold to neighbors or those that did not sell made losses. In fact, the most profitable producers were those who sold their beans to private traders, who in turn managed to sell at larger markets at higher prices where demand is high (Samboko 2011). The paper however focused more on the producer's profitability as influenced by yield, the price at which they sell their produce, land ownership, size of the household, tillage methods used, power source etc. The study did not consider traders' activities.

**2.3 Factors influencing traders' participation in crop marketing**

A number of factors influence trader participation in crop marketing: gender; age; education; availability of contracts; capital source; pricing and prices; trader associations; market information availability; and assets owned by the trader. These factors are discussed briefly in the following sections.

- *Gender:* A good proportion of traders involved in selling foodstuffs for home consumption are women (FAO 1993). In Uganda, it was found that women actively participate in crop marketing but most notably among some crops than others. For example, most cassava produced is traded by women and yet their number in coffee trading is low compared to males (Nkonya 2002). Furthermore, female traders are more likely to trade crops that do not require them to travel long distances and travel often because of their responsibilities to their families. In Kenya, just as in Uganda, studies show that if the trading business requires substantial amounts of travel, most of the traders are usually male, relatively young, fairly well educated and have alternative income sources (Muhammad, et al. 2003). In another study conducted by Chiwele et al. (1998) following liberalization of market, it was discovered that females actively participated in trading crops such as maize, beans, groundnuts and cotton. However, the study showed that their participation was on mainly at small scale levels, and as scale increased, female participation declined. Moreover, men take over production and marketing of traditional subsistence crops that women prefer to participate in when those products become more lucrative (Vargas and Vegneri 2011).

- *Age:* Studies have shown that age has an influence of decision to participate in trader crop marketing (Chiwele et al., 1998).  They found that for crop traders in Zambia's Eastern Province, small scale trading was done by females and males aged between 15 and 25 years and medium scale trading was done mostly by men and fewer women aged

between 25 and 35 years. Often these groups had little knowledge about the crops they marketed as well as marketing itself and often traded in one or two products only. Large scale traders were much older, with more knowledge on the market and the crops they marketed, as well as a diverse set of products they marketed.

- *Education:* According to Nkonya (2002), the level of education of a crop trader influenced their decision to market a particular crop. According to his study, the number of years spent in school varied among different traders as well as the crops they chose to market. For example, coffee marketing seemed to have a good number of traders with many years of schooling compared to cassava traders.

- *Contracts:* The availability of contracts between buyers and suppliers reduces the risk of loss for the supplier and is regarded a good measure of crop marketing (Janzen et al., 2006). In Latin America and the Caribbean, where exporters chose to produce agricultural products on their own, they often linked to already existing producers and used contractual arrangements so that they could focus on doing the selling – where their competitive advantage laid – instead of producing (Santacoloma, Suarez and Riveros 2007). These contracts are binding for both producers and traders, which resulted in producers being guaranteed their money because these traders bought all their produce and the traders were guaranteed of produce.

- *Source of capital:* According to Nkonya (2000), most of the crop traders in Uganda used their own savings to start up and run their businesses. Most of these traders had surplus funds that they decided to use to purchase the tradable quantities of the crop they chose to market. Farmers and traders do not have easy access to credit and so those with small savings have difficulty participating in crop marketing. A

few traders had access to credit and used these funds to start up and expand their businesses, especially for crops that require high amounts of working capital.

- *Price:* Crop traders are motivated to participate in crop marketing by the market price of the crop and their perceptions about farm gate price and other costs involved with getting the crop to market. When they have confidence of turning a profit from their efforts, they are more likely to make the necessary investments to engage in trading. Generally traders are drawn towards marketing crops that have higher returns compared to alternative crops that provide lower returns (Boughton 2007).

- *Trader associations:* The existence of trader associations may contribute to traders' confidence to engage in trading. Generally, producers and traders who belong to industry associations tend to know about the market and other conditions affecting their performance because of shared information among members of the association. Furthermore, these associations often provide traders the opportunity to build collective capital and negotiate prices (Nkonya 2002).

- *Access to market information:* Research shows that learning about new technologies – how to use them and their benefits from networks within their community – is an important determinant of the adoption decision (Morrison, Raju and Sinha 2007). This includes learning from fellow farmers, extension service agents, and gender groups. For individuals with poor quality networks, information transfer is generally impaired, reducing its value. On the other hand, those with high quality networks are more likely to of was more likely benefit from their networks and utilize the information in enhancing their performance.

- *Ownership of assets:* According to Vargas et al. (2011), men tend to have higher asset levels than women, providing then the potential for greater market access. Although this has a non-trivial impact on production and marketing of cash crops, these inequalities in resources result in different levels of participation in crop markets. Furthermore, there is a clear distinction in methods of production and modes of marketing as women's potential outcome in marketing of these crops will be low.

## 2.4 Conceptual framework

At the core of this study is the assumption of traders' optimization behavior in which they attempt to maximize profit. Profit maximization is the rational outcome from market equilibrium assumption. Any firm aiming at maximization profit will increase its output till it reaches maximum profit output (Business Property 2009). Profit is defined as total revenue minus total cost;

$$\pi = TR - TC$$

Total revenue is the total amount of money that a firm receives from sales, while total cost is the cost of all factors of production. The main constraints faced by the firm are technology; prices of factors of production; and demand for goods traded. A trader will use marginal revenue (MR) and marginal cost (MC) to decide how much to produce. If $TR = pq$ then $MR = \Delta TR / \Delta q$ depicting the change in total revenue from increasing quantity by one unit. Even though it makes sense for a firm to produce where $MR > MC$, a firm is satisfied at the point where $MR = MC$. Figure 2.1 shows that a firm will produce quantity, $q^*$ and more (ECON600 2013).

**Figure 2.1: The Profit-Maximizing Decision**
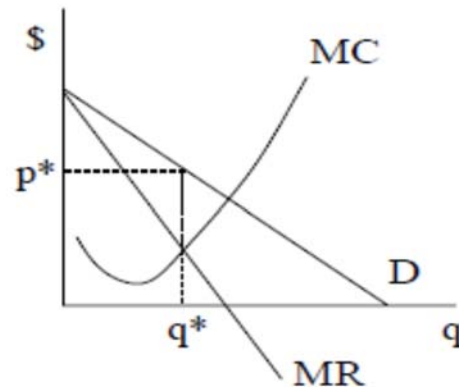


A number of factors are assumed to drive this optimization behavior. They include social networks and organizations, education status, gender, asset ownership, transaction costs, access to funds and market information, and possibly geographic location of the business. These variables may influence profitability and, hence, one's decision to participate in the market as a trader.

It is expected that traders who have access to funds, such as own savings and credit; and traders who are affiliated to a trader association are more likely participate in crop marketing than those without access to funds or trader associations (Nkonya 2002). In many cases, traders who belong to associations are exposed to market information which contribute to their effectiveness. In addition, traders who own assets are more likely to participate in trader marketing because these assets offer them the capacity to invest in purchasing of produce, incur transportation and related costs and bear these costs until the product is sold. In fact, it has been observed that because men tend to own more assets, they also tend to have larger businesses than females (Vargas and Vegneri 2011).

According to (Morrison, Raju and Sinha 2007) information about prevailing prices, modern ways of marketing, shortages and surpluses in varying markets, is more likely to influence market participation. Furthermore, the existence of niche markets often results in contract marketing which is a good hedge against any risk that could potentially leave any market player in a bad position (Janzen et al 2006). One's marital status may influence market participation: Sometimes marriage plays a big role on participation because tradable volumes are more especially for those who market the crops they grow.

Unmarried market participants are more likely to be engaged as wholesalers given the fact that this requires them to travel longer distances for longer durations. Married traders would more likely operate as retailers in order to remain closer to their homes to fulfil their family obligations. This is usually important when the traders are females. Chiwele (1998) and FAO (2013) both observe that males can be expected to participate more in large scale crop marketing operations (wholesaling) than females despite the larger proportion of female participation in agricultural marketing. Finally, Nkonya (2002) argues that traders with higher levels of formal education are more likely to engage in wholesale trade. This may be because education has the potential of increasing individuals' assets and capital access.

**CHAPTER III: METHODS AND PROCEDURES**

This chapter discusses the model and its specification as well as the analyses that were conducted. This study uses trader survey data collected in 2012 by the Pulse Value Chain Initiative – Zambia (PVCI-Z), a USAID-funded collaborative research project between the University of Zambia (UNZA) and Kansas State University (KSU). The data were collected from wholesale and retail traders in three main markets namely: Soweto, Mtendere, and Chilenje, all in Lusaka Province. The survey instrument is presented in Appendix 1.

## 3.1 Model specification and data analysis

When the endogenous variable is binary, as in the case of whether a trader chooses to operate as a wholesaler or at some other level in the chain, two models are available for the analysis: logit and the probit. While the use of either method seems to make no difference in most applications (Green, 1997), Chambers and Cox (1967) noted that discriminating between the two was possible when sample sizes were large and certain extreme patterns were observed in the data. In general, logit models have been found to be well suited for observational data while probit models have been found to work better with experimental data (Rahm and Huffman 1984).

For purposes of this study, the probit model was used. The dependent variable is defined as whether a trader is a wholesaler ($= 1$) or not a wholesaler ($= 0$). The generic presentation of the model is as follows:

$$Y_i = \alpha + \beta X_i + e_i, \tag{1}$$

Where $Y_i = 0$ if $Y^* \leq 0$ and $Y_i = 1$ if $Y_i^* > 0$, it follows that;

$$\Pr ob(Y_i = 1) = P\left(Y_i^* > 0\right) = \Pr ob(\alpha + \beta_1 X_i + e_i > 0)$$

Prob($Y_i=1$) = P($Y_i^*>0$) = Prob($\alpha + \beta_L X_i + e_i > 0$)

$$Y_i = 1\left(Y^* > 0\right) = \left\{1 \, if \, Y_i^* > 0, otherwise\right\}$$

Where, $i = 1, 2, 3, 4....,$ n denoting the sample size, $\beta$ is the set of parameters that are to

be estimated, $X_i$ is a vector of independent variables that affect the type of trader

(wholesaler or not wholesaler), and $e$ is a normally distributed error term that has a zero

mean and a constant variance.

The binary decision generates a non-linear response, hence the use of a probability

model based on a Cumulative Distribution Function (CDF). This displays a sigmoid

relation, rather than linear relationship. The marginal effect of any variable depends on the

value of the probability density function, $f(Y)$, and on the values of each exogenous

variable in the model. To obtain the marginal effects of $X_i$, the $Y$ for the mean values of

the exogenous/independent variables are first calculated, then $f(Y)$ and finally $f(Y)\beta_i$

(Boughton 2007).

Two specific models were specified and their structures were based on the findings

from the literature. The first model (Equation 2) shows the choice of being a wholesaler as

a function of the assets and resources available to the trader. It is presented as:

$$Y_i = \alpha + \beta_1 market + \beta_2 capitalsource + \beta_3 sourcecrop + \beta_4 ownassets + \beta_5 market +$$
$$\beta_6 contract + \beta_7 registration + \beta_8 growingcrop \qquad (2)$$

The variables are defined as follows:

- *Market:* the location where the product is traded. There are three markets in the

  Lusaka city area that traders indicated selling their wares: Soweto, Chilenje and

  Mtendere. Mtendere is used as the reference market to which the other two are

compared.  This is because it is the smallest of the three markets, and hence with the least likelihood of operating with wholesalers.

- *Capitalsource:* is source of capital. The sources of capital considered in this study are borrowing from fellow traders; capital from friends and family; capital from financial institution; and capital from own savings. The reference capital source is borrowed from fellow traders because this is expected to be the most unlikely approach to financing the business given the low capital situation of the majority of traders.  Traders who borrow from fellow traders, are therefore, highly unlikely to have enough to create opportunity for trading at the wholesale level.

- *Ownassets:* is ownership of assets including.  Assets are defined to include storage shed, house, shop for trading, large tonnage truck, pick-up vehicle, bicycle, TV, and car. Ownership of storage facilities is treated as the reference variable against which other assets are compared. Wholesalers need storage if they are going to succeed since they often purchase more than they can effectively dispose of in a short time and require some storage.

- *Contract:* refers to having a contract with either a seller of buyer. This is a binary variable of those indicating a contractual arrangement with suppliers.   Traders who develop contractual arrangements with producers tend to be bigger and have downstream customers whose needs they have to meet.  Therefore, it is expected that traders with contracts will more likely be involved in wholesaling than those without.

- *Registration:* is affiliation to a trader organization. It is expected that traders who are affiliated with a trader organization are more likely to participate in wholesale

trading than those who are not because such organizations provided support for larger traders.

- *Growingcrop:* refers to the trader producing the crop being marketed. It is expected that a trader who produces his or her own beans and cowpeas is highly likely to participate in the market as a wholesaler.

- *Market:* is access to market information. Traders who have access to market information are more likely to participate in wholesale trading than those without. This is because, they are expected to understand the risk involved in terms of demand and supply of their produce and also opportunities existing for them.

While Equation (1) did not control for the demographic characteristics of the trader, the trader's demographic characteristics are explicitly included in Equation (2). This allows for an assessment of the effect of these variables on being a wholesaler. The demographic variables included as level of education, gender and marital status. The model was specified as follows:

$$Y_i = \alpha + \beta_1 market + \beta_2 capitalsource + \beta_3 sourcecrop + \beta_4 ownassets + \beta_5 Marketing + \beta_6 contract + \beta_7 registration + \beta_8 growingcrop + \beta education + \beta gender + \beta maritals \tag{3}$$

- *Education:* refers to a trader's level of education. Five levels of education were identified, including "no education", which was used as the reference against which the other education levels were compared. The expectation is that the higher the level of education of the trader, the greater the likelihood of being a wholesaler.

- *Gender:* is the gender of a trader where males are expected to participate in wholesale trading more than females.

- *Maritals*: is the marital status of the trader. An unmarried trader is more likely to be a wholesaler because of the lack of familial responsibilities that confront him or her. However, a married trader may be expected to have greater access to resources that would allow him or her to also participate as a wholesaler. Therefore, the effect of marital status is expected to be ineffective of discriminating between being a wholesaler and not being a wholesaler.

# CHAPTER IV: RESULTS AND DISCUSSION

This chapter discusses the study's main findings as provided by the data that was analyzed. Descriptive statistics of trader characteristics are discussed first, followed by probit regression results.

## 4.1 Trader characteristics

The characteristics of the trader include age; family size; acreage; yield; education status; marital status; and gender of traders. Continuous variables are presented first followed by discrete variables

### 4.1.1 Socio-economic characteristics

Table 4.1 shows the average age of a trader as 39 years old, with the youngest being 18 years and the oldest being 65 years old. The average size of a trader's family is 2 people per household. For traders that are also farmers, the average size of the land planted to beans or cowpeas was 0.04 hectares, and out of this, the mean yield was 5.89kg/ha. Not all traders are farmers and in fact, some of those who are farmers still buy some of the beans or cowpeas they market because their farm produce alone cannot make marketable volumes.

**Table 4.1: Socio-economic characteristics of traders**

| Variable | N | Mean | Std. Dev | Min | Max |
|----------|-----|-------|-----------|-----|------|
| Age | 246 | 38.80 | 8.856931 | 18 | 65 |
| Family size | 246 | 2.00 | 1.368976 | 1 | 11 |
| Acreage(ha) | 246 | .04 | .3615407 | 0 | 6 |
| Yield(kg/ha) | 246 | 5.89 | 66.49840 | 0 | 1406 |

### 4.1.2 Gender distribution of traders

Cowpea and bean trading, like virtually all agricultural product trading in Zambia, is dominated by females. About 81.1% of traders are female while 18.9% are male. This is

consistent with the FAO's findings that women participate more in marketing agricultural products to sell and make money to purchase household food consumption. In Uganda, females were more involved in trading crops like cassava and the males prefer to trade more of crops like coffee, where sales were higher. It is common for males to participate actively in maize marketing because sales are considered very high compared to most crops grown in Zambia including beans and cowpeas. However, since the study engaged trader participating in both retail and wholesale trading, this may explain this result. Women seem to participate more in small scale trading where men prefer large scale trading. In this study, only 36% of respondents participated in wholesale trading.

*4.1.3 Age distribution of traders*

According to Figure 4.1, the majority of traders (57%) are between 20 and 40 years old. Only 1% of traders are in the less than 20 years group. About 42% is older than 40 years. It is important to note that about 30% of Zambia's population is between 25 and 54 years while only 5.3% is older than 55 years (CIA World Factbook, 2013). This would seem to suggest that, as expected, traders tend to have a higher proportion of older people than are present in the total population.

According to Chiwele (1998), traders aged between 15 and 35 years have a tendency to engage in small to medium scale trading of crops while those aged above 35 years engage in large scale trading. Similarly, in this study, the majority of traders participated in retail trading which is small to medium scale trading.

**Figure 4.1: Age Distribution of bean and cowpea traders**
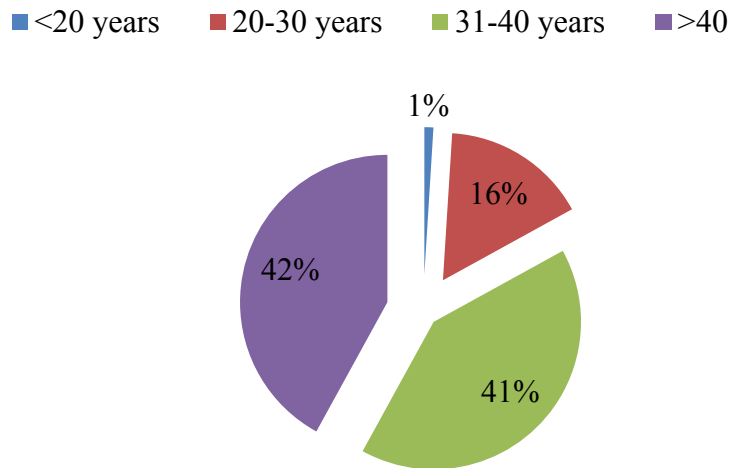


4.1.4 *Education level of traders*

Most of the traders have spent some years attending school except about 6%, who never attended school. In Zambia, an individual must complete the first seven years of schooling to complete primary school. The eighth to the twelfth year is secondary school and beyond that is considered tertiary education. This will include universities, technical colleges and similar institutions. According to Figure 4.2, 7% of traders have completed lower primary (four years) and 28% have completed lower secondary (9 years). Finally, a very small proportion (0.4%) completed tertiary education. This distribution is not very surprising because as people move up in education, more secure job opportunities become available and trading becomes less attractive.

**Figure 4.2: Education level of traders**
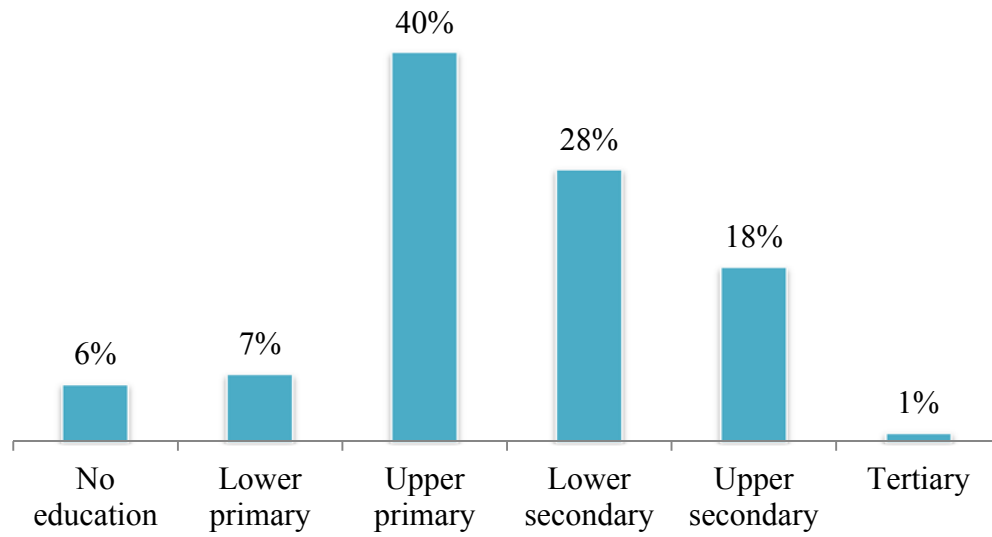


*4.1.5 Marital Status of Traders*

A trader's marital status is one important characteristic to consider. Given the age distribution of the respondents, it is unsurprising that the majority of them (67%) are married or cohabiting. This is somewhat not surprising considering that the majority of them are in their over 20 years, and most people are married by their mid to late 20s. About one in five respondents indicated that they were divorced or separated while only 15% indicated being single.

**Figure 4.3: Marital status of traders**
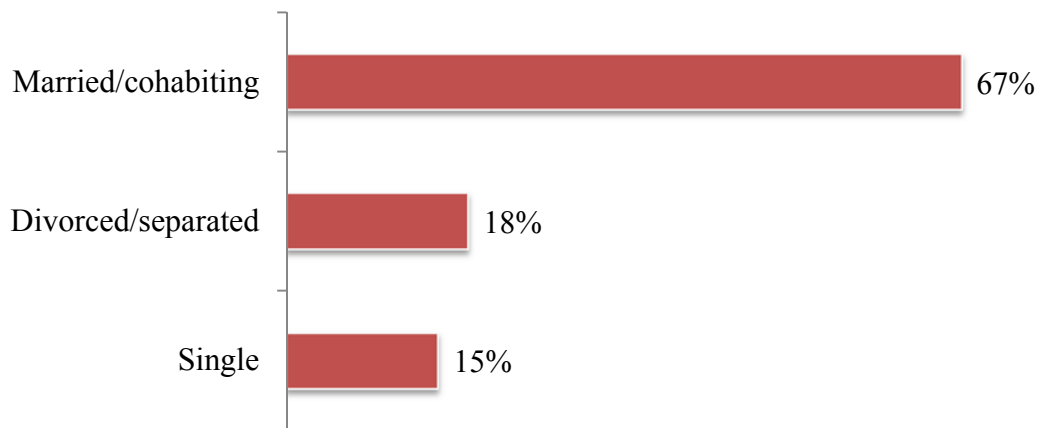


4.2 Trader participation by trader affiliation and farmer

The pulses industry in not as organized in Zambia as maize is.  Therefore, it is not surprising that only a few (about 1%) traders are members of a trader association. We have argued that trader associations provide value to their members in the form of information about market conditions and also offer the potential to provide them with credit when they need them.  The legal constraints that may be in place in Zambia with respect to the formation of these associations may explain the low participation.  The data also shows that only 13% of respondents grew crops that they sold.  This would suggest that most traders are real traders who are procuring produce for sale.  Those who produce the produce they sell may be seen as adding value to their agricultural products through the embeddedness of the trading (distribution) service in the production process. About 22% of respondents who were wholesale traders did not grow any crops while 39% were neither wholesale traders nor growers.  There may be seen as the non-wholesalers in the sample.  It is interesting to note that about 26% of respondents indicated being bean and cowpea growers but did not operate as wholesalers.  This may be explained as those who operated as retailers in data.

**Table 4.2: Distribution of traders who grew their traded product**

| Grew traded Crop | Participation in wholesale trading | | Frequency |
|---|---|---|---|
| | Yes | No | |
| Yes | 13% | 26% | 96 |
| No | 22% | 39% | 150 |
| Total | 100% | | 246 |

## 4.3 Distribution of traders by trader category

The nature of the supply chain would suggest that there should be a higher proportion of traders operating at the retail end than at the wholesale end. This is confirmed by the data. About 64% of respondents are retailers, 14% indicated operating in both the retail and wholesale stages in the chain. The research includes the 14% of respondents operating in both retail and wholesale in the wholesale group, yielding about 36% or 88 of the 246 respondents in the group of interest for the econometric analysis.

## 4.4 Frequency distribution of independent variables

In order to put the results of the econometric analysis into perspective, it is important to develop another perspective on the independent variables. The frequency and proportion of respondents providing information on the key variable are presented in Table 4.3. Recall that the reference market in the model is Mtendere and the table shows that of the 246 respondents, only 31 (13%) trade in this market. Also, the reference for assets was ownership of storage facility and only nine respondents indicated owning this asset. Furthermore, only three respondents indicated borrowing from other traders. The principal source of capital for traders is their own savings (60% indicating), which is what is found in most entrepreneurial ventures. Nkonya (2002) showed that in Nigeria most traders used

their own savings with only a few borrowing from financial institutions. Friends and family are the second-most important source of capital and that is reflected in this data too, with that category of capital source accounting for about 30% of respondents. These low frequencies of reference variables in the model may affect the estimated coefficients. Therefore, it is important that significant care is employed in interpreting the results.

**Table 4.3: Frequency distribution of independent variables**

| Variable | Frequency | Percent |
|---|---|---|
| Traders with access to market information | 189 | 77 |
| Traders with existing contracts with buyer/seller | 15 | 6 |
| Traders who sell produce in Chilenje market | 29 | 12 |
| Traders who sell produce in Mtendere market | 31 | 13 |
| Traders who sell produce in Soweto market | 183 | 75 |
| Traders who purchase their produce within their market | 131 | 53 |
| Traders who purchase their produce within Lusaka District | 51 | 21 |
| Traders who purchase their produce outside Lusaka District | 73 | 30 |
| Traders who obtain their capital from fellow traders | 3 | 1 |
| Traders who obtain their capital from friends and family | 72 | 30 |
| Traders who obtain their capital from own savings | 147 | 60 |
| Traders who obtain their capital from financial institutions | 7 | 3 |
| Traders who own a storage shed | 9 | 4 |
| Traders who own a house | 172 | 70 |
| Traders who won a shop for trading | 227 | 92 |
| Traders who own a bicycle | 20 | 8 |
| Traders who own a large tonnage truck | 221 | 90 |
| Traders who own a pick-up vehicle | 211 | 86 |
| Traders who own a car | 207 | 84 |
| Traders who own a TV | 109 | 44 |

## 4.5 Factors influencing trader participation

The results for ownership of assets in the Table 4.4 are compared with ownership of a storage shed. The default variable for the source of capital was any capital that was

obtained from fellow traders. The influence of the source of the crop was compared with sourcing a crop from within the market. The default case for the market where the crop is marketed is Mtendere market. The base variable for education variables was traders with no schooling. All base variables were not included in the regression to avoid a dummy variable trap, but are used to interpret the findings.

When demographic characteristics of respondents are not controlled for in the model, the coefficient of variation is 0.497, with a Prob > Chi(square) = 0.00. The log likelihood is -68.91. The column labelled ME in Table 4.4 presents the calculated marginal effects for each of the explanatory variables on the dependent variable, i.e., whether the respondent is a wholesale trader. The standard error associated with the marginal effect coefficient is presented next to the marginal effect column. The MEC column presents the marginal effect coefficients controlled for demographic characteristics of the respondent. Their standard errors are presented in the last column next to the MEC column. Thus, Table 4.4 presents the results of the two models that were estimated.

In the first model (where demographic characteristics are not controlled), it is found that there was significant difference between traders who purchased their produce outside Lusaka District and those who purchased their produce in the market in which they traded. The traders purchasing outside Lusaka District were about 37% more likely to be wholesale traders than those who purchased in the market in which they operated. This likelihood was significant at the 1% level. This result did not change in statistical significance when demographic characteristics were controlled for. There was a slightly lower probability (34.3%) that traders buying outside Lusaka District were wholesalers compared to those buying in their operating markets.

**Table 4.4: trader characteristic influencing trader participation**

| Variables | ME | S.E. | MEC | S.E. |
|---|---|---|---|---|
| Trading in Chilenje Market | -0.191 | -0.256 | -0.078 | -0.230 |
| Trading in Soweto Market | -0.210 | -0.221 | -0.084 | -0.169 |
| Have contracts with buyers/sellers | 0.115 | -0.114 | 0.077 | -0.117 |
| Buy produce in Lusaka District | 0.069 | -0.225 | -0.101 | -0.183 |
| Buy produce outside Lusaka District | 0.371*** | -0.033 | 0.343*** | -0.039 |
| Producing their own crop | 0.009 | -0.062 | -0.020 | -0.063 |
| Have price information | 0.049 | -0.058 | 0.073 | -0.061 |
| Own a house | -0.103* | -0.061 | -0.103 | -0.063 |
| Own a pick-up vehicle | 0.040 | -0.082 | 0.054 | -0.088 |
| Own a larger tonnage Truck | 0.082 | -0.112 | 0.085 | -0.109 |
| Own a bicycle | 0.393** | -0.171 | 0.368** | -0.180 |
| Own a shop | 0.188* | -0.104 | 0.253** | -0.111 |
| Own a TV | -0.046 | -0.068 | -0.044 | -0.073 |
| Own a car | 0.003 | -0.079 | 0.042 | -0.082 |
| Borrow from friends & family | -0.178** | -0.089 | -0.167* | -0.085 |
| Borrow from financial institutions | -0.121 | -0.187 | -0.121 | -0.200 |
| Use their own savings | -0.038 | -0.082 | 0.009 | -0.083 |
| Traders who are also farmers | 0.008 | -0.092 | -0.037 | -0.092 |
| Gender | | | 0.091 | 0.051 |
| Lower primary education | | | 0.307** | -0.151 |
| Upper primary education | | | 0.172 | -0.121 |
| Lower secondary education | | | 0.309** | -0.126 |
| Upper secondary education | | | 0.267** | -0.135 |
| Married | | | 0.047 | -0.069 |
| Divorced/separated | | | -0.035 | -0.120 |
| Widowed | | | 0.084 | -0.109 |
| Observations | 201 | | 198 | |

*** p<0.01, ** p<0.05, * p<0.1

Ownership of a bicycle compared to ownership of a storage facility was more likely to influence being a wholesaler. There was nearly a 40% higher probability that someone owning a bicycle would be a wholesaler instead of a retailer. This positive effect on being a wholesaler remained true when respondent demographic characteristics were controlled. However, it declined slightly to 36.8%. Traders who owned a shop had about 18.8% higher probability of being wholesalers than retailers. However, when demographics were controlled, this probability increased to 25.3%, but the statistical significance declined from

5% to 10%.  It was interesting to note that owning a house reduced the probability of being a wholesaler by about 10% compared to owning a storage facility, but this was only significant at the 10% level. When controlled for respondent demographics, house ownership was not significantly different from the storage ownership.  No other variable was statistically significant in explaining whether an individual is a wholesaler under the model where demographic variables are not controlled for.

It is interesting to note that respondents with lower primary education are about 31% more likely to be wholesalers compared to those without any education.  What is interesting is that this probability is not very different from traders with lower secondary education.  However, those with upper secondary education have about 26.7% higher probability than those without any education to be wholesalers.  This estimate was statistically significant at the 5% level.  Nkonya (2002) shows that traders with higher levels of education are likely to participate more than those with lower levels. This may be because, in general, assets and other factors that influence ability to operate at the wholesale level are correlated with education level.

Males were about 9% more likely than females to be wholesalers.  This was only significant at the 10% level, suggesting that below 10% level of significance, there was no difference between the genders in being wholesalers given the model that was estimated in this study.  It is possible that the trades are not large enough for males to take them over, as suggested by Chiwele (1998).

# CHAPTER V: CONCLUSION AND RECOMMENDATIONS

The objectives of this thesis were to determine the influence of traders' resource and asset situation as well as their demographic characteristics on operating in the wholesale level for beans and cowpeas instead of at the retail level. The study showed that purchasing produce outside Lusaka District had the most significant impact on whether they operated as wholesalers in comparison to purchasing their produce in their operating market. The study also found that owning a bicycle and a shop increased the probability of being a wholesaler over owning a storage facility. However, borrowing from friends and family reduced this probability compared to borrowing from other traders. As expected, males are more likely to be operating at the wholesale level than females. However, this was only barely in this dataset.

## 5.1 Recommendations

The results from this thesis can be looked into further and possibly be improved by including economic variables such as quantities traded, price of commodity, and profitability of product. Incorporating the economic and transaction costs could illuminate the gender challenges that may influence participation at the wholesale level. The incorporation of these variable would also provide stronger direction for policymakers in determining how different policy instruments may be utilized to cultivate and nurture wholesaler in the bean and cowpea industry in Zambia.

More studies may also be done to determine the effect of education and the effect of asset ownership given the small number of respondents in the reference group. This will strengthen the hypothesis that traders with more years of schooling are more likely to participate in wholesale trading than those without.

There is need to foster increased understanding of the significance of pulse crops, especially beans and cowpeas that are already being produced and traded by some key players Zambia.  This is even more important today as the Government has reduced subsidies on maize, the most commonly grown crop.  There is an opportunity for the Government to invest in increasing awareness about supply chain in this industry and working with its participants to improve efficiency and, potentially, the growth of the small businesses in the space. It is imperative to recognize that beans and cowpeas not only generate income for those who sell them but also add nutritional value to the diets of many Zambians, thereby contributing to reducing the levels of under nutrition.

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**Bean and Cowpea Trader Survey Questionnaire**

| 1. District name and code | **dist** | | | |
|---|---|---|---|---|

2. Market from which trader operates (1=Soweto; 2=Chilenje; 3=Mtendere; 4=Buseko; 5= Ng'ombe; 6=Mandevu)     **mkt**

| 3a. Trader name and code | **trader** | |
|---|---|---|
| 3b. Respondent relationship (1= owner; 2= Employee; 3= Family/friend; 4=spouse; 5 =other (specify)) **resp** | | |
| 3c. Category of trader (1=Retail trader; 2=Wholesale trader; 3=Both wholesale and retail) | **tcat** | |

| 4.     Trader     date     of     birth     (dd/mm/yyyy) **dob** | | |
|---|---|---|
| 5. Sex of trader (1=male; 2=female) | | |

6. Education level of trader (0=none; 1=lower primary; 2=upper primary; 3=junior secondary; 4=senior secondary; 5=tertiary)     **tedu**

6b. Trader's marital status (1= never married; 2=married; 4=divorced; 5= widowed; 6=separated; 7=cohabiting)     **mast**

| 7. Demographics of trader's household | Number of members | | Number chronically ill | |
|---|---|---|---|---|
| | Male | Female | Male | Female |
| 7.1 Children under 5 years | | | | |
| 7.2 Children 5-14.99 years | | | | |
| 7.3 Prime-age adults 15-59.9 years | | | | |

| | 7.4 Elderly members 60 years or older | | | | |

## SECTION 1: INCOME GENERATING ACTIVITIES from the 1st May 2011 to the 30th April 2012.

We would now like to ask about the earnings from each business activity that you have been involved in between 1st May 2011 and 30th April 2012.

**Table 1.1. All Business Activities** *Key Variables: DIST, MKT, TRADER, BACT* **Reference Period: 1st May 2011 to 30th April 2012**

| Please list all economic activities that you were involved in at any time from 1 May 2011 to 30 April 2012. *See codes below* | Where did You carry out this activity? *Put all that apply separated by a comma* *See codes below* | For which months was revenue ….. (*ask none first, low second and high last*) **1= None; 2 = Low; 3 = High** **If earnings are constant for all months, probe further.** | | | | | | | | | | | | | In a typical high revenue month, how much did you receive/spend on …? | | In a typical low revenue month, how much did you receive/spend on …? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2011 | | | | | | | | 2012 | | | | Total **Gross Income** *(ZMK)* | Total **Expenses** *(ZMK)* | Total **Gross Income** *(ZMK)* | Total **Expenses** *(ZMK)* |
| | | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | | | | |
| **BACT** | **B1** | **B2** | **B3** | **B4** | **B5** | **B6** | **B7** | **B8** | **B9** | **B10** | **B11** | **B12** | **B13** | **B14** | **B15** | **B16** | **B17** |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

**Economic Activities (BACT)**

41 = selling own beans
42 = selling own cowpeas
43=Bean trading
44=Cowpea trading

45=Maize trading
46=Vegetables and fruits

1=agricultural trading (other crops)
2=livestock trading
3=retailer/shop owner

4=marketeer/hawker/vender
5=firewood/charcoal production and selling
6=carpentry
7=builder / construction

8=local brewing and selling
9=butchery (including game, cooked or uncooked)
10=agricultural services (e.g., ploughing, planting)
11=milling
12=cooking oil processing and selling

13=agro-processing
14=tailoring
15=bicycle repairing
16=weaving (cloth and reed/basketry) and selling
17=blacksmithing
18=traditional healing
19=fishing and selling
20=precious stone mining (small scale)
21=gathering ants and caterpillars and selling

22=collecting mushroom and selling
23=collecting wild honey and selling
24=beekeeping and honey selling
25=curio business

26=hair salon / barbershop business
27=Employment

28=other (specify) _____

**Location of activity (B01)**

0=at market
1=within Lusaka
2=other district in LP
4=other province

5=other country

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## SECTION 2: SOURCES OF BEANS AND COWPEAS from the 1st May 2011 to the 30th April 2012.

We would like now to know the sources of beans and cowpeas between 1st May 2011 and 30th April 2012.

**Table 2.1.  Sources of Beans and Cowpeas Only**  *Key Variables: DIST, MKT, TRADER, MONTH* *Reference Period: 1st May 2011 to 30th April 2012*

| Month/Year | Did you order beans in ....? 1=yes 2=no--> PS07 | How many times did you order beans in ...? | Where did you order your beans from in…? See codes below If 1→PS05 If | If within Lusaka, where in …? See codes below | Which source district supplied beans in …? Use district codes at the back Enter all that apply separated | What was the size of a typical order of beans in ...? | | Did you order cowpeas in ....? 1=yes 2=no--> next month | How many times did you order cowpeas in ...? | Where did you order cowpeas from in…? See codes below If 1→PS11 If | If within Lusaka, where in …? See codes below | Which source district supplied cowpeas in ...? Use district codes Enter all that apply separated with a comma | What was the size of a typical order of cowpeas in ...? | |
| | | | | | | Quantity | Unit (see units below) | | | | | | Quantity | Unit (see units below) |
| **MONTH** | **PS01** | **PS02** | **PS03** | **PS03b** | **PS04** | **PS05** | **PS06** | **PS07** | **PS08** | **PS09** | **PS09b** | **PS10** | **PS11** | **PS12** |
| 1=May 2011 | | | | | | | | | | | | | | |
| 2=June 2011 | | | | | | | | | | | | | | |
| 3=July | | | | | | | | | | | | | | |
| 4=Aug | | | | | | | | | | | | | | |
| 5=Sep 2011 | | | | | | | | | | | | | | |
| 6=Oct 2011 | | | | | | | | | | | | | | |
| 7=Nov | | | | | | | | | | | | | | |
| 8=Dec 2011 | | | | | | | | | | | | | | |
| 9=Jan 2012 | | | | | | | | | | | | | | |
| 10=Feb | | | | | | | | | | | | | | |
| 11=Mar | | | | | | | | | | | | | | |
| 12=Apr | | | | | | | | | | | | | | |

**Table 2.2 Beans/cowpeas contracts**

| Crop | | Did you have a contract with any of the supplier/buyer of …? 1=yes; 2=no; 96=N/A➔*next category/section 3* | How long was the contract? | | | | Was the contract verbal or written? 1=Written 2=verbal |
|---|---|---|---|---|---|---|---|
| | | | Start month (mm) | Start year (yyyy) | End month (mm) | End year (yyyy) | |
| **CROP** | **BUY** | **C01** | **C02** | **C03** | **C04** | **C05** | **C06** |
| 12=Beans | 1=Suppliers | | | | | | |
| | 2=Buyers | | | | | | |
| 14=Cowpeas | 1=Suppliers | | | | | | |
| | 2=Buyers | | | | | | |

**Source of beans (PS03, PS09)**

1= Within the market (farmers bring)

2= Within Lusaka but not market

3=Outside Lusaka

**Sources within Lusaka (PS03b; PS09b)**

1=Soweto

2=Libala

3=Other (speficy)

**Unit codes (PS06, PS12)**

| | | |
|---|---|---|
| 1=90kg bag | 4=10kg bag | 12=Meda |
| 2=50kg bag | 10=Tin/bucket (16-20 kg) | 17=tonnes |
| 3=25kg bag | 11=5lt gallon | 20=kilogram |

**SECTION 3: COST OF PROCURING BEANS AND COWPEAS (1$^{st}$ May 2011 to 30$^{th}$ April 2012 Marketing Season)**

| Crop | Category of months by volume of business | Did you have to go out in the field to buy the majority of …(crop) in this period? 1=yes 2=no→next month | How much did you pay for your own transport to the location from which you procured beans/cowpeas as in a typical … month? (ZMK) | Did you pay for crop during the low/high volume on cash or by barter? 1=Cash 2=Barter→ indicate cost in VB02/VC02 by calculating value of exchanged goods | How long did you stay at source during a typical … month? (Days) | What was the cost of upkeep and other costs per trip during…? (ZMK) | How much did you pay to transport the crop from the source (village) to the district centre (Boma) *Enter 0 if they did not stop at Boma, and enter entire cost in PC08* | | How much did you pay to transport the crop from the source district centre to Lusaka | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | ZMK | Unit (*see codes below*) | Charge (ZMK) | Per (Unit) *See codes* |
| **CROP** | **MONC** | **PC01** | **PC02** | **PC03** | **PC04** | **PC05** | **PC0** | **PC07** | **PC08** | **PC09** |
| 12=Beans | 2=Low | | | | | | | | | |
| | 3=Hig | | | | | | | | | |
| 14=Cowpeas | 2=Low | | | | | | | | | |
| | 3=Hig | | | | | | | | | |

**Table 3.1 Beans and Cowpeas** *Key Variables: DIST, MKT, TRADER, CROP, MONCAT*  **Reference Period: 1$^{st}$ May 2011 to 30$^{th}$ April 2012**

3.1 Did you incur any extra cost/charges at the point of procurement other than that of the crop itself? (1=yes; 2=no→*Section 4A*)

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**Table 3.2 Other Costs Incurred** *Key Variables: DIST, MKT, TRADER, CROP, MONCAT* ***Reference Period: 1ˢᵗ May 2011 to 30ᵗʰ April 2012***

| Category of months by volume of business | | Fixed Storage charge (*Ya Kabende*) | | Wheelbarrow charges to and from stand per day | Cost of sorting per unit | | Charge for empty bags | | Other costs (specify) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Charge (ZMK) | Unit (*See codes below)* | Charge (ZMK) | Charge (ZMK) | Unit (*See codes below* | Charge (ZMK) | Unit (*See codes below)* | Name of cost | Charge (ZMK) | Unit (*See codes below)* |
| **CROP** | **MONCAT** | **EC01** | **EC02** | **EC03** | **EC04** | **EC05** | **EC06** | **EC07** | **EC08** | **EC09** | **EC10** |
| 12=Beans | 2=Low volume | | | | | | | | | | |
| | 3=High volume | | | | | | | | | | |
| 14=Cowpeas | 2=Low volume | | | | | | | | | | |
| | 3=High volume | | | | | | | | | | |

**Unit codes (PC07, PC09, PC11, EC05, EC07, EC10 )**

| | | |
|---|---|---|
| 1=90kg bag | 4=10kg bag | 12=Meda |
| 2=50kg bag | 10=Tin/bucket (16-20 kg) | 17=tonnes |
| 3=25kg bag | 11=5lt gallon | 20=kilogram |

## SECTION 4A:  B E A N / C O W P E A STOCKS AND SALES (1st May 2011 to 30th April 2012 Marketing Season)

**Enumerator**: *Tell respondent that we would like to know more information about bean and cowpea sales.*

### Table 4.1 Sales to individual and institutional buyers     Key Variables: *DIST, MKT, TRADER, CROP, MONCAT*
### Reference Period: 1st May 2011 to 30th April 2012

| Crop | Category of months by volume of business | Did you sell this crop to individual consumers during…? 1=yes 2=no→SL05 96=N/A | In a typical … month, what quantity do you sell to individual consumers? | | What proportion of these individual buyers were buying for reselling? (See codes below) Enter 0 if none | Did you sell this crop to any institutional buyers during …? 1=yes 2=no→ next crop/month | Who was your major institutional buyer of …? (see codes below) | How far is this institutional buyer from your market? (km) (1 mile=1.6 kilometre) Enter 0 if at | Did you deliver to any of these buyers? 1=Yes 2=No → SL10 | If yes, how much did you pay for transportation (ZMK) Enter zero if none (buyer paid) | Did you sell on cash basis or credit to the institutional buyer? 1=Cash →SL12 | If you sold on credit, how long did it take for the institutional buyer to pay you? (weeks) Enter 0 if it took less | In a typical … month, what quantity do you sell to institutional consumers? | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Quantity | Unit (See codes below) | | | | | | | | | Quantity | Unit (See codes below) |
| **CROP** | **MONCAT** | **SL01** | **SL02** | **SL03** | **SL04** | **SL05** | **SL06** | **SL07** | **SL08** | **SL09** | **SL10** | **SL11** | **SL12** | **SL13** |
| 12=Beans | 2=Low volume | | | | | | | | | | | | | |
| | 3=High volume | | | | | | | | | | | | | |
| 14=Cowpeas | 2=Low volume | | | | | | | | | | | | | |
| | 3=High volume | | | | | | | | | | | | | |

**Proportion (SL04)**

1=Less than a ¼                    4=More than ¾
2=Between a ¼ and ½         5=All of them
3=Between ½ and ¾

**Unit codes (SL03, SL13)**

1=90kg bag          4=10kg bag                         11=5lt gallon
2=50kg bag          10=Tin/bucket (16-20 kg)     12=MEDA
3=25kg bag          20=kilogram                         17=tonnes
                                                                        21= ka BP

**Buyer codes (SL06)**

1=Construction companies      4= Lodges
2=Churches                               5=Schools
3=Hospitals                               6=other (specify)

## SECTION 4B: BEAN/COWPEA STOCKS AND STORAGE

**Table 4.2 Bean/cowpea storage costs**    *Key Variables:* DIST, MKT, TRADER, CROP, MONCAT    **Reference Period: 1ˢᵗ May 2011 to 30ᵗʰ April 2012**

| Crop | Category of months by volume of business | What is the typical quantity of your stock per order…? | | How long did it take you to sell/clear this stock during…? *See codes below* | Are you charged to store your stock? 1=yes 2=no→WT09 | What was the storage charge? | | | Did you consider storage costs when pricing the …(crop) during the … period? 1=yes 2=no | Did you use any chemicals/ measures to protect your stock that had stayed long to protect it from pests? 1=yes 2=no→*next row* | What chemicals/measures did you use and their cost? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Quantity | Units (*See codes below*) | | | Charge | Unit (*See codes below*) | Per (Period) (*See codes below*) | | | Chemicals/ measures (*See codes below*) | Quantity | Units | Cost per unit (ZMK) |
| **CROP** | **MONCAT** | **WT01** | **WT02** | **WT03** | **WT04** | **WT05** | **WT06** | **WT07** | **WT08** | **WT09** | **WT10** | **WT11** | **WT12** | **WT13** |
| 12=Beans | 2=Low | | | | | | | | | | | | | |
| | 3=High | | | | | | | | | | | | | |
| 14=Cowpeas | 2=Low | | | | | | | | | | | | | |
| | 3=High | | | | | | | | | | | | | |

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4.7. Did/do you own a storage shed?     (1=yes; 2= no➔*section 4C*)                          |_____|

4.8. Is the storage exclusively yours or shared? (1=exclusive owner; 2= shared)

| 4.9 How much did other pay to rent the shed to store their beans/cowpeas? | Charge | Quantity (*See codes (*WT02)) | Period (*See codes below)* |
|---|---|---|---|
| | | | |

4.10. What is the structure     **Roof/lid:**  1=Iron sheets/asbestos 2= Grass thatched 3= plastic cover 4= metal  5=other (specify)  [____]

**Walls :** 1= burnt bricks 2= Wood 3= Block 4= open wall 5=Other (specify)  [____]

**Floor:** 1= concrete 2= earth 3= wooden 4= Mud 5= other (specify)  [____]

| **WT02, WT06** | | **Length of storage (WT03)** | **Period** | **Chemicals (WT08)** |
|---|---|---|---|---|
| 1=90kg bag | 11=5lt gallon | 1=Less than a week | 1= Per day | 1=Chilindamatula dust |
| 2=50kg bag | 12=MEDA | 2=1-2 weeks | 2= Per week | |
| 3=25kg bag | 17=tonnes | 3=2-3 weeks | 4=Per month | |
| 4=10kg bag | 20=kilogram | 4= 3-4 weeks | 5=Until stock is cleared (indefinite) | |
| 10=Tin/bucket | 16-20 kg | 5=More than one month | | 4=Other (specify) |

## SECTION 4C: BEAN VARIETIES AND PRICES (1ˢᵗ May 2011 to 30ᵗʰ April 2012 Marketing Season)

We would now like to know about the varieties that you dealt in and their prices

**Table 4.3 Bean varieties and prices**   *Key Variables: DIST, MKT, TRADER, CROP, MONCAT***Reference Period: 1ˢᵗ May 2011 to 30ᵗʰ April 2012**

| Crop | Category of months by volume of business | What varieties of beans did you sell during …months? *Enter the codes below* | What was the farm level price of the … variety during the …month? (*For trader who goes* | | What was the wholesale price for ….variety during ..? (*order price for* | | Retail price (*Selling price for wholesale trader*) | | Did you sell this crop variety to institutional buyers? 1=Yes; 2=No→next row | What was the price of this variety to institutional buyers? | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Price (ZMK) | Unit (*See codes WT02*) | Price (ZMK) | Unit (*See codes WT02*) | Price (ZMK) | Unit (*See codes WT02*) | | Price (ZMK) | Unit (*See codes WT02*) |
| **CROP** | **MONCAT** | **VB01** | **VB02** | **VB03** | **VB04** | **VB05** | **VB06** | **VB07** | **VB08** | **VB09** | **VB10** |
| 12=Beans | 2=Low volume | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | 3=High Volume | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**Table 4.4 Cowpea varieties and prices**

| Crop | Category of months by volume of business | What varieties of cowpeas did you sell during …months? *Enter the codes below* | What was the farm level price of the … variety during the …month? *(For trader who goes with by)* | | What was the wholesale price for ….variety during ..? *(order price for wholesale trader)* | | Retail price (*Selling price for wholesale trader*) | | Did you sell this crop variety to institutional buyers? 1=Yes; 2=No→next row | What was the price of this variety to institutional buyers? | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Price (ZMK) | Unit (*See codes* | Price (ZMK) | Unit (*See codes* | Price (ZMK) | Unit (*See codes* | | Price (ZMK) | Unit (*See codes* |
| **CROP** | **MONCA** | **VC01** | **VC02** | **VC03** | **VC04** | **VC05** | **VC06** | **VC07** | **VC08** | **VC09** | **VC10** |
| 14=Cowpea | 2=Low volume | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | 3=High Volume | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| Beans Varieties (VB01) | | Cowpeas varieties (VC01) | | | |
|---|---|---|---|---|---|
| 1=Kabulangeti | 4=Solwezi | 1=Local Maroon | 4=Local speckled brown black | 7= Local speckled brown white | 10=Local light brown |
| 2=White and Yellow | 5=Lundazi (Red beans) | 2=Local purple | 5=Local speckled purple grey | 8=Local white | 11=Musandile |
| 3=Lusaka (yellow) | 6= | 3=Bubebe | 6=Local speckled brown grey | 9= Luntembwe | |

## SECTION 4D: QUESTIONS ON IMPORT AND EXPORT OF CROPS *from 1st May 2011 to 30th April 2012*

Beans ☐   Cowpeas ☐

4.16 Did you import beans/cowpeas between 1st May 2011 and 30th April 2012? Yes=1 No=2→*4.17*

**Table 4.4 Questions on importation of crops**

| Crop | Which months did you import [crop]? *(mm/yyyy)* | Which countries did you import from? *(see codes below)* | Which varieties did you import? *(see codes VB01/VC01)* | How much [crop] did you import? | | What was the order price in the country? | | What was the transport cost of [crop]? | | What were the border fees incurred? | | What were other fees you incurred? *(insert 96 if none incurred)* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Quantity | Unit *(see codes WT02)* | Price (ZMK) | Unit *(see codes WT02)* | Price (ZMK) *(insert 0 if none paid)* | Unit *(see codes WT02)* | Price (ZMK) *(Insert 0 if n/a)* | Unit *(see codes WT02)* | Cost name | Price (ZMK) | Unit *(see codes WT02)* |
| CROP | IMP01 | IMP02 | IMP03 | IMP04 | IMP05 | IMP06 | IMP07 | IMP08 | IMP09 | IMP10 | IMP11 | IMP12 | IMP13 | IMP14 |
| 12=Beans | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| 14=Cowpea | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |

Beans ☐   Cowpeas ☐

4.17 Did you export beans/cowpeas between 1st May 2011 and 30th April 2012? Yes=1 No=2→*skip to Section 5*

**Table 4.5 Questions on exportation of crops**

| Crop | Which months did you export [crop]? *(mm/yyyy)* | Which countries did you export to? *(see codes below)* | Which varieties did you export? *(see codes VB01/VC01)* | Did you sell to individual or institutional buyers? *Enter 1=institutional 2=individual 3=both* | How much [crop] did you export? | | What was the export price? | | What was the transport cost of [crop]? | | What were other fees you incurred? *(insert 96 if none incurred)* | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Quantity | Unit *(see codes WT02)* | Price (ZMK) | Unit *(see codes WT02)* | Price (ZMK) *(insert 0 if none paid)* | Unit *(see codesWT02)* | Cost name | Price (ZMK) | Unit *(see codes WT02)* |
| **CROP** | **EXP01** | **EXP02** | **EXP03** | **EXP04** | **EXP05** | **EXP06** | **EXP07** | **EXP08** | **EXP09** | **EXP10** | **EXP11** | **EXP12** | **EXP13** |
| 12=Beans | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 14=Cowpea | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

Country codes (IMP02) (EXP02)
1=Angola        2=Zimbabwe        3=Malawi        4=Tanzania        5=Namibia        6=Congo D. R.        7=Other (specify)

|                                                                                                      | **Beans** | **Cowpeas** |
|------------------------------------------------------------------------------------------------------|-----------|-------------|

4.11 To what extent do you trust the people you procure beans/cowpeas from? (1=Not at all; 2=Somewhat; 3=A lot; 96=N/A)

4.12 To what extent do you trust the people to whom you sell beans/cowpeas? (1=Not at all; 2=Somewhat; 3=A lot; 96=N/A)

|                        | **Beans** | **Cowpeas** |
|------------------------|-----------|-------------|
| Individual buyers      |           |             |
| Institutional buyers   |           |             |

|                                                                                    | **Beans** | **Cowpeas** |
|------------------------------------------------------------------------------------|-----------|-------------|
| 4.13. Do you sell beans/cowpeas on credit? (1=Yes; 2=No➔*4.15)*                     |           |             |

4.14. If a buyer does not pay you, do other traders get to know about it? (1=Yes; 2=No)

4.15 What is your main source of capital?
               1. Other traders
               2. Friends and family
               3. Financial institution
               4. Own capital            |_____|
               5. Other (specify)_____

## SECTION 5: QUESTIONS ABOUT AGRICULTURAL INFORMATION, DISTANCES TO AND COST OF AGRICULTURAL SERVICES

5.1 Access to information about prices

| Crop | Do you get access to information about …(crop) prices? 1=Yes 2=No→next row | What is your main source of information? See codes below | What is your second most important source of information (See codes below) |
|---|---|---|---|
| | **IP01** | **IP02** | **IP03** |
| 12=Beans | | | |
| 14=Cowpeas | | | |
| 1=Maize | | | |

**IP02; IP03**

| | | | | | |
|---|---|---|---|---|---|
| 1 = Extension Agent | 4 = Pamphlet/Newspaper | 7 = ZNFU SMS | 12 = Outgrowers | 15 = Television | 18 = Other (specify) |
| 2 = Farmer/neighbor | 5 = Workshop | 8 = NGO | 13 = Shops | 16 = Market place | |
| 3 = Radio Program | 6 = Field Day | 11 = Trader / Marketeer | 14 = Headman | 17 = Farmer group – cooperative | |

5.2. Which varieties are most popular among your customers (list by order of preference, starting with the most preferred)?

| 12=Beans | |
|---|---|
| 14=Cowpeas | |

|  | **Beans** | | **Cowpeas** | |
|---|---|---|---|---|
| 5.3. How long have you been selling beans/cowpeas? (*Unit codes: 1=Months; 2=Years*) | Length | Unit | Length | Unit |
| | | | | |

5.4. How do you determine the price for beans and cowpeas you sell in the market? (1=yes; 2=no; 96=N/A)

| | **Beans** | **Cowpea** |
|---|---|---|
| 1=Whatever other traders are selling at | | |
| 2=Looking at the cost of ordering the stock | | |
| 3=Availability of the crop | | |
| 4=Seed variety | | |
| 5 = Quality and buyer willingness to pay | | |
| 6=Other (specify) | | |

5.5. Do you keep any business records?(1=yes; 2=no→5.7)    |_____|

5.6 If yes, which of the following business records do you keep?
(1=yes; 2=no)

5.6a. Sales and purchases records

5.6b. Cashflow records

5.6c. Operations records

5.6d. Inventory records

5.7. If no to 5.5 above, would you like to keep business records?    (1=yes; 2=no)

5.8. Are you a crop farmer?    (1=yes; 2= no→*Section 6*)

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**Table 5.1 Information about growing of beans/cowpeas**

| Crop | Season | Did you grow beans/cowpeas that you sold between 1st May 2011 and 30th April 2012? 1=yes; 2=no→*next season/crop* | What was the size of the beans/cowpeas field? | | What was the yield for beans/cowpeas? | |
|---|---|---|---|---|---|---|
| | | | Quantity | Unit *(see codes below)* | Quantity | Unit *(for units refer to WT02 on page 6)* |
| **CROP** | **SEASON** | **CG01** | **CG02** | **CG03** | **CG04** | **CG05** |
| 12=Beans | 1=2010-2011 | | | | | |
| | 2=2011-2012 | | | | | |
| 14=Cowpeas | 1=2010-2011 | | | | | |
| | 2=2011-2012 | | | | | |

**CGO3**

| | |
|---|---|
| 1=Lima | 3=Hectare |
| 2=Acre | 4=Meter square |

**SECTION 6: HOUSEHOLD MARKETING ASSETS/IMPLEMENTS**

Please tell us about the type and number of assets in working condition owned by the household.

**Table 6. Traders selling beans/cowpeas**   *Key Variables:* DIST, MKT, TRADER, CROP, MONCAT   ***Reference Period: 1 May 2011 to 30 April 2012***

| Type of Assets *Enumerator: Please ask AST01* | | During the period between 1st May 2011-30th April 2012 did you own.......? *1 = Yes* *2 = No –> go to AST03* | How many......did you have in working condition on 1st May 2011? *(Enter 0 if none)* | Do you own any ............ in working condition now? *1 = Yes* *2 = No –> go to next asset* | How many ......... do you have in working condition now? *(Enter the number)* |
|---|---|---|---|---|---|
| | **ASSET** | **AST01** | **AST02** | **AST03** | **AST04** |
| Storage Shed | 1 | | | | |
| House | 2 | | | | |
| Pick up vehicle | 3 | | | | |
| Truck | 4 | | | | |
| Bicycle | 5 | | | | |
| Wheelbarrow | 6 | | | | |
| Shop | 7 | | | | |
| Cell phone | 8 | | | | |
| Market stand | 9 | | | | |
| Radio | 10 | | | | |
| TV | 11 | | | | |
| Weighing scale | 12 | | | | |
| Car | 13 | | | | |
| Farmland* | 14 | | | | |

*for farmland, put size in Hectares (ha) in AST02

| | ZMK | Per (Unit) |
|---|---|---|
| 6.1 **[If trader owns a stand]** How much were rentals for your stand? (*Unit codes: 1=per day; 2=week; 3=Month; 4=Year*) | | |

6.2 Are you a member of a traders association? (1=yes; 2=no➔*Section 7*)

6.3 Is it mandatory to be a member? (1=yes; 2= no)

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| ZMK | Per (Unit) |
|---|---|
|  |  |

6.4 What is the membership fee in the association? (*Unit codes: 1=per day; 2=week; 3=Month; 4=Year*)

## SECTION 7: TRADER PERCEPTIONS OF THE TRADING ENVIRONMENT

7.1 Constraints faced at different stages and solutions suggested

| Stage | Did you face any constraints at any of the following stages?<br>1=Yes<br>2=No→*next row* | Constraint | What can be done? | By who? |
|---|---|---|---|---|
| 1=Procurement |  |  |  |  |
| 2=Transportation |  |  |  |  |
| 3=Storage |  |  |  |  |
| 4=Actual selling |  |  |  |  |
| 5=Other (specify) |  |  |  |  |

7.2 How important do you consider the following when ordering beans/cowpeas (1=very important; 2=important; 3=not important)?

|  | Beans | Cowpeas |
|---|---|---|
| 7.2a. Insect, pest, disease free |  |  |
| 7.2b. Variety |  |  |
| 7.2c. minimal damage/breakage |  |  |
| 7.2d. Price |  |  |
| 7.2e. Colour |  |  |
| 7.2f. Size of grains |  |  |
| 7.3 Do you think that there are major entry barriers in the beans/cowpeas trade?  (1=yes; 2= no) |  |  |

| 7.4 If yes, what are the major entry barriers? | |
|---|---|
| 12=Beans |  |
|  |  |
| 14=Cowpeas |  |
|  |  |