

**ASHESI UNIVERSITY COLLEGE**

**DETERMINING THE TECHNICAL FEASIBILITY OF AN AGRICULTURAL  
COMMODITY EXCHANGE IN GHANA**

By

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Thesis submitted to the Department of Business Administration/ Computer  
Science/Management Information Systems,

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In partial fulfilment of Bachelor of Science degree in /Business Administration

**MAY 2012**

## **CHAPTER ONE**

### Acronyms:

*WRS- Warehouse Receipt System*

*GCX- Ghanaian Commodities Exchange*

*ECX-Ethiopian Commodities Exchange*

## **INTRODUCTION**

This paper seeks to explain the concept of an agricultural commodity exchange and provides the reader with a practical understanding of the concept. The focus of the study is Ghana. The paper also seeks to highlight the conditions that will enable the Ghanaian economy operate under such a system. The paper's main objective is to determine the technical feasibility of such a system in Ghana, given various constraints this economy faces.

### **1.1 Background**

First of all, a market is defined as a place which serves as a medium for the exchange of goods for consideration, which are mostly monetary gains. In this global age, transactions between buyers and sellers are done mainly through electronic means. For this reason, the physical marketplace is not mandatory for the exchange. ("Commodities Market", 2011)

Commodities are defined as products which have some commercial value, which can be either manufactured, purchased, sold or consumed. Commodities are mainly those products which belong to the primary sector of the economy including agriculture (for example wheat, corn, barley) and

extractable raw materials, for example, crude oil, gas. These products usually serve as major inputs for the secondary sector of the economy. (Santos, 2010)

According to Gideon Onumah, a commodity exchange essentially serves as a medium, which is usually either physical or electronic, through which buyers and sellers are brought together, mainly through a group of registered brokers. This market deals mainly in physical commodities or in derivatives. The essence of an agricultural commodity exchange is to manage the risks of unexpected reductions in the value of the underlying asset. (Onumah, 2009)

The agricultural commodity exchange system evolved in the nineteenth century when Chicago became a commercial centre, connecting the state officially to the United States of America. (Singh et al, 2011) The connection attracted the Midwest farmers, who hoped they could sell their produce, mainly wheat, for reasonable prices. There was very minimal storage capacity in this city so farmers usually were exploited by the dealers. However, in the latter part of the nineteenth century, an immediate system of trade, also known as the spot or cash exchange, evolved which enabled the sellers deliver commodities to the buyer immediately after a transaction however sometimes at a specified later date. (Hieronymus, 1977)

Slowly, farmers and buyers entered into contracts for future exchanges of grains for cash in the future so that farmers could avoid transportation and storage costs if the price was not acceptable. This system served well for both parties because the farmer knew how much he would be

paid and the dealer also was aware of procurement much earlier. Eventually these future contracts became very popular and were used as collateral in some banks. (Santos, 2010)

Eventually, all the contracts became standardized based on the quantity and quality of the commodities being traded. The contracts also began to change hands before the delivery date. Dealers could trade their contracts, whenever they decided they did not want wheat, with other interested people. The farmer could also pass on his contractual obligation to another farmer if he did want to deliver his wheat. The price of the contract would go up and down depending on what was happening in the wheat market. If the weather was bad, there would be a lesser supply of wheat and all the people who had contracted to sell wheat would hold on to their contracts expecting to fetch a better price. On the other hand, if the harvest was better, the seller's contract would be less valuable since wheat supply is abundant. ("Commodities Market", 2011)

## **1.2 Problem Statement**

Trade in agricultural commodities has been liberalized in Ghana since the latter part of the twentieth century. (Khor, 2006) This has created an avenue for private trade to flourish but commodity trade is guarded by a number of factors, which increase transaction costs, leading to lower profit margins for producers, higher costs for processors and high retail commodity pricing. (Onumah, 2010)

Most agricultural commodities in Ghana have several intermediaries in their marketing chains and this makes the chain very lengthy. The maize marketing chain is used here to serve as a graphical representation for many of the commodities in Ghana (See Table 1) The individuals included in the marketing chain include small scale aggregators and handlers at the rural level who transact business with middlemen so they can bulk supply to major wholesale markets in the country. Typically, the aggregators are severely under-capitalized but they operate in rural markets where transactions are predominantly cash-based, due to lack of trust between farmers and traders. Quite often, these aggregators are expected to provide cash advances to farmers as a means of securing commodities.

Furthermore, they tend to extend trade credit, ranging between 1 to 2 weeks to traders in the urban wholesale markets. The inability of the traders to gain access to formal finance contributes to the acute liquidity constraints in commodity marketing and reduces the capacity of the trade to absorb significant surpluses, hence reducing farm gate prices, especially during harvest. ("Marketing Conditions", 2011)

The situation described above is one reason why distribution margins – between farm gate and wholesale/retail prices – tend to be very wide. Though this is often blamed on "unscrupulous" middlemen extracting super profits from producers, various studies suggest that the underlying causes include the inefficiencies in the marketing chain. (Onumah, 2010) Other factors that increase transaction costs in the trade and widen distribution

margins include the high transportation costs and the time and related cost in assembling small volumes of produce, particularly where supply is uncertain. Indeed, the bulking process tends to be very slow and costly, because of the small volumes produced by the widely-dispersed smallholder farmers and uncertainty and/or lack of information about available supplies. Another factor contributing to high transaction cost in the agricultural commodity trade is poor contract enforcement. Partly due to this problem, trust between farmers and traders has been eroded, leading to the situation where the rural trade is predominantly cash-based. ("Marketing Conditions, 2011)

The bargaining position of farmers is often very weak, especially at harvest because there are few alternative buyers with sufficient capital to absorb the large surplus available at the time. They are also under pressure to sell because of household cash needs – to pay off production credit and to meet household consumption needs – but they lack access to finance which will allow them to defer sale. Their inability to access finance is partly due to lack of suitable collateral. Lacking suitable on-farm storage facilities, farmers are unable to defer sale without significant post-harvest losses. Their bargaining position is further weakened by limited access to price-sensitive market information. The itinerant aggregators, who trade between rural and urban markets, tend to be better informed and exploit their information advantage. (Shahidur, 2010)

For most domestic food commodities, no quality differentiation occurs in the markets, and no quality premium is paid, especially at the farm gate.

The emerging market for premium quality grains in Ghana, particularly for produce supplied to major processors such as Nestle, GAFCO Ltd. and the breweries is generally expected to grow in the medium term, but remains small relative to the informal trade which offers no quality premiums.

As a result of agricultural trading; farmers, traders and processors are fully exposed to price risks with minimal opportunities to hedge against such risks. The uncertainty created discourages long-term planning by farmers, as they often respond on ad hoc basis to price signals. It also discourages sellers and wholesalers, distributors from investing into this sector, which could lead to an improved efficiency in trade. (Onumah, 2010)

In markets such as Mali and Niger, trade in agricultural commodities is informal and faces similar challenges as the domestic trade. Also, ad hoc agricultural trade policies often challenge the development of formal regional trade, and this may lead to a decline of the overall competitiveness of the Ghanaian farmers. This is despite the growing recognition that the value of regional trade in agricultural commodities between African countries could potentially dwarf export revenues from traditional agricultural exports. (Garcia, 2010)

Many of the aforementioned problems can be dwarfed with the successful introduction of an agricultural commodity exchange, which will serve as physical or electronic means of trading in agricultural products. The essence of an agricultural commodity exchange is to manage the risks of unexpected reductions in the values of underlying assets. (Onumah, 2010) This GCX will serve as a means of centralizing the trading of commodities.

The coordination of trading activities through an agricultural commodity exchange will help reduce costs which are usually related with identifying market outlets and physically inspecting all tradable commodities. Through the centralization of trading activities in the GCX, transfers will be easily facilitated. Market transparency is also a potential benefit of this system as all parties will be made aware of the various trading parties will be knowledgeable of the commodity prices before trading. Commodity exchange systems depend largely on warehouse receipts.

Warehouse receipts are mainly documents which have been issued by warehouse operators in order to certify the quality and quantity of a specific commodity. Warehouse receipts serve as trading instruments used to increase efficiency in agricultural trade. They serve as a means of transferring ownership without physical delivery of commodities. Warehouse receipt systems also serve as financing instruments when they gain credibility in the market. When the WRS is backed by a suitable legal framework, these receipts can be used as secure collateral for inventory financing.

With this background, the objectives of this study will be mentioned subsequently.

### **1.3 Objectives**

The objectives of the study include:

- Determining if Ghana has the adequate capacity, good quality of warehouses to store grains and if these warehouses are located in easily mobile areas
- Determining what will make the Banks accept receipts from farmers
- Determining the capacity of existing institutions to conduct certification of the quality of grains
- Determining the feasibility of commodities exchange in Ghana

### **1.4 Research Questions**

- i) What are the conditions which need to be satisfied in order to implement such a system?
- ii) Is it feasible to implement this model at all?

The main aim of this study is to determine if it is feasible to develop an agricultural commodity exchange in Ghana. In order to determine the feasibility, the research paper needed to investigate the enabling conditions of such a system.

## **1.5 Significance of the study**

Essentially, the dissertation is concerned with the technical feasibility of such a system in the Ghanaian economy considering all the conditions which will have to be satisfied and the duration it will take to ensure all these conditions are met before the system can be implemented.

This research topic was chosen in order to throw light on the Ghanaian agricultural sector, which is usually neglected, and make people aware of commodity exchanges, which serves as an efficient system for the development of an efficient agricultural sector in the country.

## **1.6 Methodology**

This study was conducted in the Greater Accra region where there are a significant number of commodity exchange experts. The study is qualitative and descriptive. The sample was chosen using the purposive sampling procedure. Interviews with select representatives from 6 banks aided in the in data collection. Also, responses from experts from the Ghana Standards Board, Ministry of Agriculture and the Ghana Statistical Service were used in data collection. The data analysis was mostly done by using Microsoft Excel. Secondary sources of data were also used in this study. United Nations Council for Trade and Development (UNCTAD) papers and other internet sources were also used in gathering data.

## **1.7 Scope of study**

The study examines the importance of commodity exchanges and whether such a system can be implemented in Ghana. The paper is determined to review part of the agricultural sector and come up with a solid basis for determining the technical feasibility of the exchange. The paper looks at all the conditions which need to be met in order to ensure the system can be implemented.

## **Chapter Organization**

### **The study is presented in five chapters:**

Chapter One gives a general introduction to the study and provides a brief background of the study. The chapter also informs the reader of the objectives of the study, significance and scope of the study as well as the problem statement and research questions.

Chapter Two reviews the related literature concerning the study and theoretical framework used.

Chapter Three explains the methodology employed for the research. This includes the study design, sampling, data collection methods.

Chapter Four illustrates and explain the data collected from the preceding chapter.

Chapter Five presents a summary of the findings, conclusions and recommendations.

## **CHAPTER TWO**

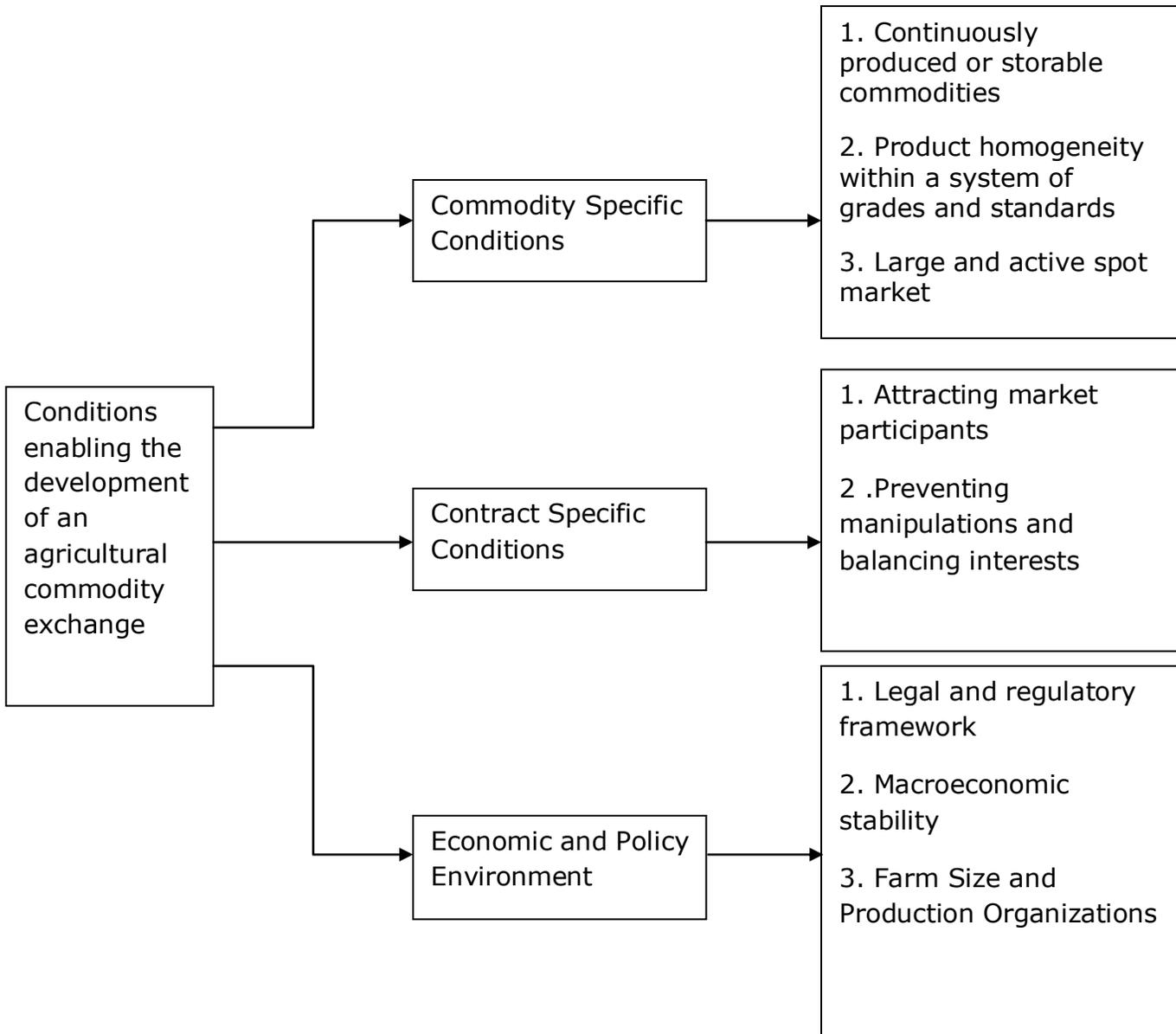
### **Literature Review**

#### **2.1 Introduction**

This chapter focuses on the conditions that are needed to ensure the exchange is implemented efficiently. The chapter dwells on literature which was obtained from UNCTAD papers, individual and collective papers as well as from the internet. This literature is intended to give the reader a deeper insight in relation to the topic and provide a standpoint as well.

According to literature proposed by Shahidur et al, D Black and Jayne et al, in order for a commodity exchange to function efficiently, the exchange must attract significant volumes of trade in order to enable it spread the costs of its services over a sufficient base of users. The literature proposes that commodity exchanges will only succeed if three main categories are met. Firstly, the commodities should meet specific conditions. Secondly, all commodities should meet particular contract conditions. Thirdly, there should be a strong macroeconomic environment to facilitate the exchange.

## 2.2 Theoretical Framework



Source: Gideon Onumah, 2010

The specific conditions for commodities to aid and ensure the smooth facilitating of the GCX are mentioned in the subsequent paragraphs.

### **1.1. Continuously Produced or Storable Commodities**

All commodities in an agricultural commodity exchange system should be constantly produced in order to serve on this exchange. According to Shahidur, in recent years, there have been certain advancements in technology which enable the storage of certain agricultural produce.

Foods such as frozen fish and meat, which were previously excluded from the exchange in other countries, have been added because they can be stored efficiently. These fragile goods can now be used in the agricultural commodities exchange. Also, the recent advancements in technology have enabled farmers to extend the production period for many of these commodities. These recent advancements in technology have increased the number and variety of major commodities in the agricultural commodity exchange marketplace. (Black, 1986)

### **1.2 Product Homogeneity within a System of Grades and Standards**

According to the literature, single commodities each have different characteristics in terms of the level of contamination, the moisture content and also their varying measures of purity. In order to trade commodities in an exchange, there has to be the existence of a standard measure based on the basic characteristics these commodities should possess. Through this standardized categorization, commodities will gain some form of similarity.

The main exports in Ghana, mainly wheat and cocoa, have standardized grades and standards. However, commodities consumed locally do not really have this. This makes it hard to trade with such commodities grades and standards. The cereal market is lacking in this standardization and grading sector. Very few cereals have been able to be graded and standardized in order to easily facilitate the agricultural commodity exchange. The South African Commodity Exchange is one of the few exchanges which have been able to differentiate themselves by developing an efficient standardization and grading for their cereals. (Shahidur, 2010)

### **1.3 Large and active cash market**

Commodities traded on exchanges depend largely on the size of the cash market, in relation to the worth and quantity of market participants. Usually, if an exchange is considered valuable, more people will be interested in trading. Through this high interest, trade will be more successful and this will add more value to the exchange. Also, because large volumes of trade help in improving the agricultural commodities exchange, there will be increases in revenue which will help cover the start-up charges of the exchange. Also, active spot markets help provide information on the different preferences of the traders and this will help form contracts and aid in bidding for the tradable commodities. (Black, 1986)

## **2. Contract-Specific Conditions**

Agricultural Commodity Exchanges can effectively function if the contracts being traded are attractive to the market participants. In countries where commodities exchanges have gained maturity, some contracts still fail as a result of the low attraction rate people have for them. This means that few people are interested in trading in these contracts. According to Leuthold (2004), from the mid twentieth century to the late twentieth century, 100 out of 341 contracts were given approval by the Agricultural Trading Commission. In his study, he raises the issue that successful agricultural commodity exchanges, with a high number of tradable contracts, can easily take in ineffective contracts.

### **2.1. Attracting Market Participants**

The attractiveness of market participants to an agricultural commodity exchange should be high in order to increase the number of buyers, sellers and brokers. As mentioned the preceding discussion (see 1.3), large cash markets increase the value of agricultural exchanges and increase the number of participants in the agricultural commodity exchange. This helps create an attraction for market participants. (Shahidur, 2010)

However, when the economy of a country is not stable, people are less attracted to trade. When the infrastructure costs and interest rates continuously change, hedgers and other participants are no longer attracted

to trade. The sizes and values of these standard contracts must be satisfactory to the traders in order to enable them use their contracts as collateral for bank loans.

Essentially, the commodity exchange system will work efficiently if market participants are attracted to it. This means there should be no favorability of one party over another, and the macro economy should be stable.

## **2.2 Preventing manipulations and balancing interests**

In order for buyers and sellers to trade on an agricultural exchange, they must trust the contracts to be traded. It is essential to show objectivity by not favoring one party over another. Gray (1996) in his paper stated that if one party was favored over another through trading on the exchange would potentially fail if it is not revised.

## **3 Economic and Policy Environment**

The introduction of commodity exchanges was highly privatized. The public sector had very little to do with the exchange. However, in recent times, the agricultural commodity exchanges in other countries such as Ethiopia have public bodies facilitating the exchange.

### **3.1. Physical Infrastructure**

According to Garcia (2004) commodities exchanges will be successful as a result of communication and transportation infrastructure. The agricultural commodity exchange needs a high level of communication between all market participants in order to serve as an information-base for them. Essentially, there needs to be available transportation in order to deliver commodities to the buyers. Also, transportation is necessary to ensure safe and reliable delivery of all the purchased commodities specific to the various trading contracts. These infrastructures is needed to also serve as a connector of all the various cash markets and provide readily available information to all these markets in relation to the standards and quantities of the available commodities to be traded. According to Breisinger, other countries that have sufficient infrastructure have succeeded on the exchange.

### **3.2 Macroeconomic Stability**

Essentially another condition for the successful implementation of an agricultural commodity exchange is the level of macroeconomic stability of the country. The literature proposes that if sound policies of trade do not exist in an economy, the exchange will not succeed. The Zimbabwean commodity exchange failed because there were continuous increases as fluctuations in the market thus making it difficult to trade commodities.

Generally, a country's macro economy should be relatively steady in order to facilitate this exchange.

### **3.3 Farm Size and Production Organizations**

The existence of small businesses in the form of sole proprietorships in the Ghanaian context is very dominant. Jayne et al (2006) reports that, the average size of farms in Ghana are below two hectares. Very few of these farmers are not in direct contact with commodity exchanges in the country. These farmers do not the processes involved in communicating with representatives in order to gain some understanding of this system.

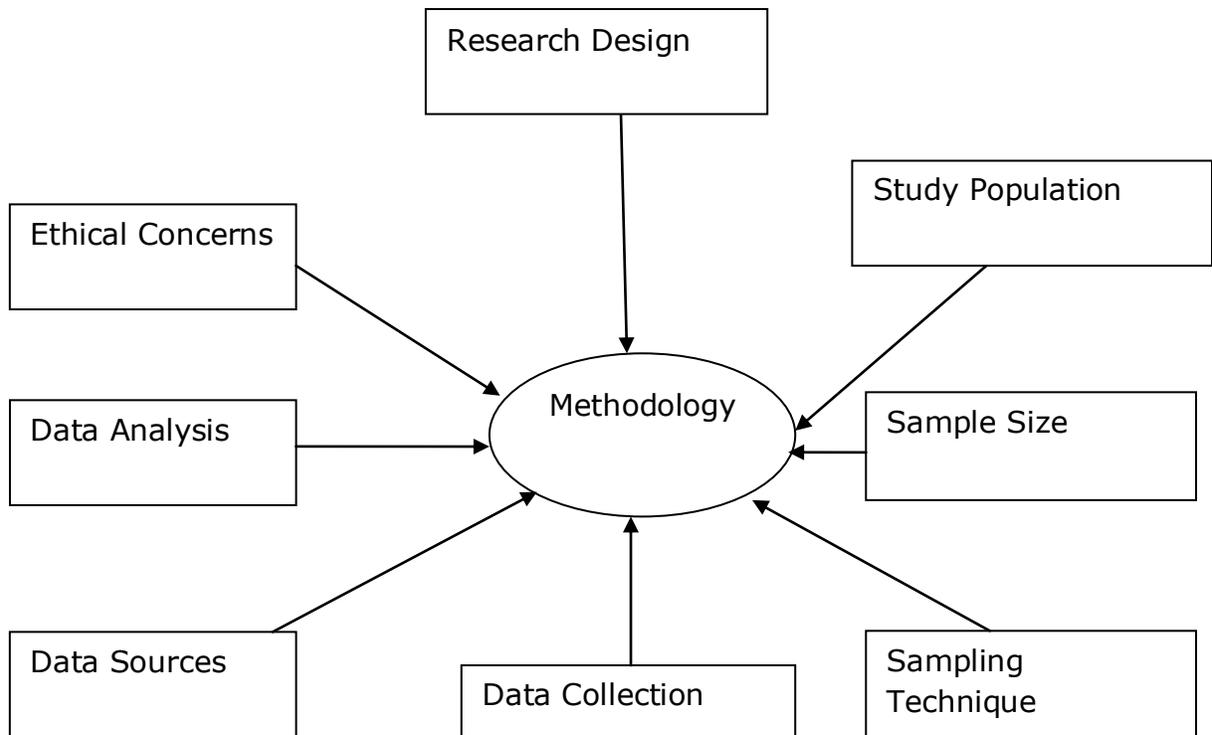
It is very relevant then that some of these farmers are briefed on the system in order to encourage them participate when the system actually starts. In Ghana, additional facilities and organizations will need to be set up in order to create links between these farmers and the exchange. These bodies will also serve as a medium to communicate the quality, grades of the commodities to buyers.

## CHAPTER THREE

### Methodology

The previous section discussed the literature review of this dissertation. This chapter, on the other hand, deals with the methods the researcher employed in the study. This mainly includes the research design, sample frame, the population, sampling techniques, methods of data collection and data analysis. The chapter also discusses the instruments which will be used in data collection, the procedure for data collection and the methods for data analysis.

#### Graphical Representation of Methodology



## **Research Design**

The research conducted for this paper was qualitative. This form of research concentrates on smaller and focused samples rather than large samples. This form of research was used because it is concerned with gaining an in-depth understanding of the research topic by narrowing down the interviewees to those who have specialized understanding of the topic. The research is not concerned with the number of people to be interviewed but is more concerned with the quality of information received from the few select individuals.

In determining the technical feasibility of an agricultural commodity exchange in Ghana, this paper is more qualitative focusing mainly on the few individuals or organizations which are abreast with the topic.

## **Research Method**

The research method will consist mainly of interviews. The interviews will be conducted with representatives from The Ghana Statistical Service in order to obtain information about the number of warehouses in the country, the capacity of these warehouses as well as their locations. Also, data on the capacity of the existing warehouses was obtained from the worldBank.

Also, interviews were conducted with two representatives from six different banks namely Agricultural Development Bank, ECOBank, Ghana Commercial Bank, Standard Chartered Bank, Stanbic Bank, Ghana Standards

Board and six commodity exchange experts in the Accra. These banks each have associations with the research topic so they each provided specialized information on the topic.

Stanbic Bank has South African affiliates who are involved in the commodity exchange system. (Mangudhla, 2011) For this reason, the researcher was aware that they will be able to provide relevant information on the topic. The researcher also visited ECOBank because the bank is concerned with the settlement of debts. This bank signed an agreement with the Industrial and Commercial Bank of China to provide a framework for cooperation in trade and settlement and the settlement netting of precious metals transactions. (Andani, 2011)

The Agricultural Development Bank aims at encouraging agricultural development and at providing support for development of sound agricultural policies and effective national strategies. (IADB, 2011) This Bank was also selected because of the specialized information they have on the topic. The Ghana Commercial Bank's main objective is to support the private sector and facilitate the nation's economic growth. (GB1, 2007) The bank is concerned with achieving agricultural growth and for this reason was very useful in providing information on the agricultural commodity exchange of Ghana.

There were also interviews conducted with representatives from the Ministry of Agriculture. The Agricultural Ministry's Mission is to promote sustainable agriculture and thriving agribusiness through research and technology development, effective extension and other support services to

farmers, processors and traders for improved livelihood. For this reason, they were chosen to shed light on the topic.

Also, there were interviews conducted with experts from the Ghana Standards Board to determine the processes used in determining the quality of the grades of the agricultural products. The Statistical Board, as one of its objectives, seeks to stimulate research activities in all fields of statistics and the researcher interviewed the members because they had specialized information on the topic. (GSS, 2009)

### **Methods of Data Collection**

The main instruments that were employed for data collection were interviews. Interviews are necessary in order to gather information on the constraints to setting up such a system. The purpose of the interview was to probe the ideas of the interviewees about the phenomenon of interest. Secondary data, in the form of UNCTAD papers and internet articles, were also used in gathering data.

### **Area of Study**

The researcher concentrated in Accra where all these organizations are located. Accra is the capital of Ghana and has the most number of individuals and organizations concerned with the GCX.

### **Sampling Strategy**

The researcher used purposive sampling to address those individuals who have an in-depth understanding of the commodity exchange system and have contributions to make to the research. This technique is also known as judgmental sampling. It is known as judgmental sampling because researchers only select subjects who in their opinion are relevant to the project. (Sarantakos, 2005) This research targets these people because they can aid in determining the measures Ghana will have to ensure in order to start such a system.

### **Limitations of the Research**

The experts interviewed for this research were busy individuals who had very little time to spare for the interviews. Two of the interviews conducted with the Ministry of Agriculture and the ECOBank representative were very short and not very detailed. Both parties were called in the middle of the meeting to attend to other pressing issues. The researcher, as a result of this, did not receive sufficient information from these two bodies.

## **CHAPTER FOUR**

### **Introduction**

Through this research conduction process, the researcher has gathered the following findings. Content Analysis was used in analyzing some of the data. This was to help reduce objectivity and reach more objective conclusions by grouping similar views and drawing conclusions based on the frequencies of the responses. Inferences were drawn by combining content analysis with other forms of data analysis such as Excel.

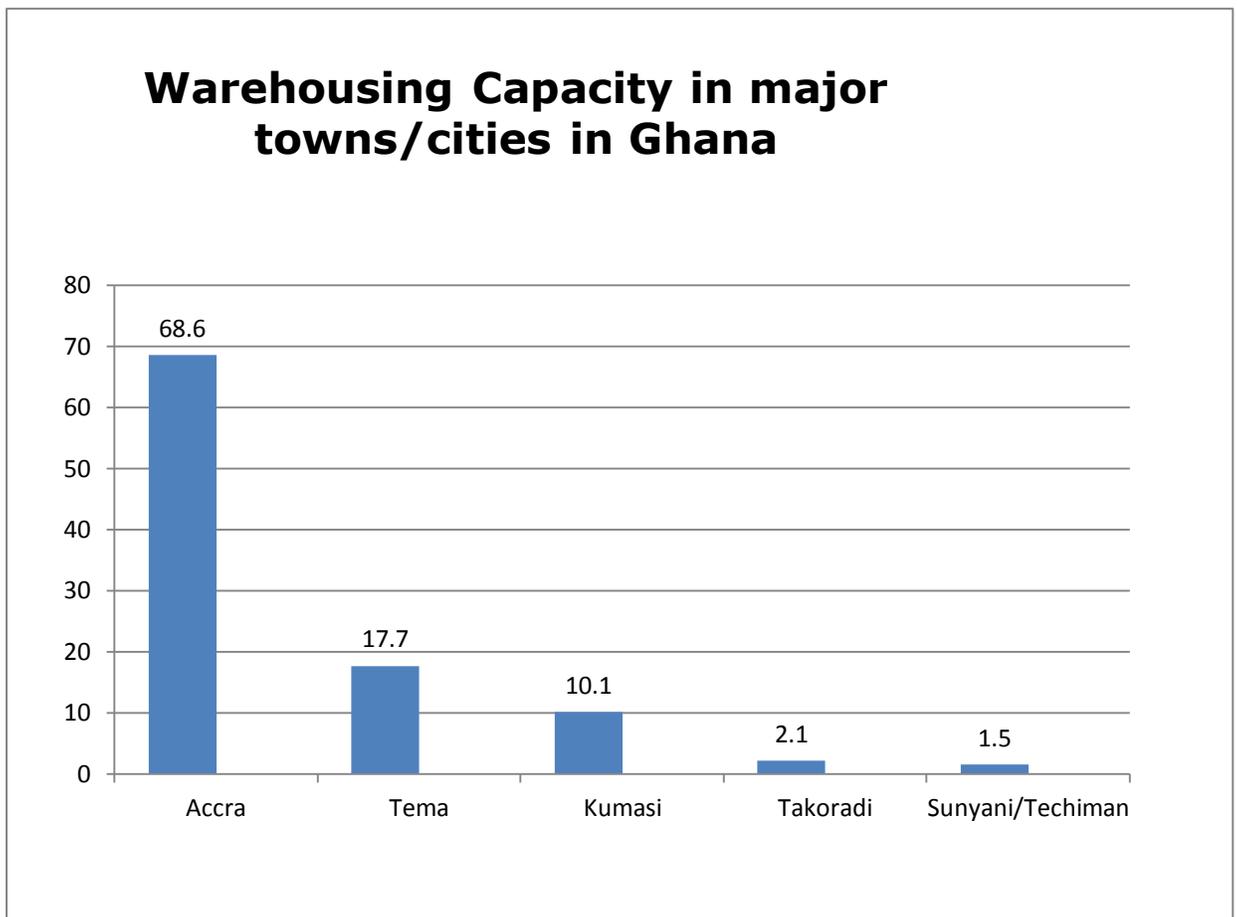
All findings in the research are based on the responses of the experts as well as on the data collected from secondary sources. The findings are directly linked to the following objectives (see also chapter one). The main objectives of the study are:

- Determining whether there are enough warehouses in Ghana which have the adequate capacity to support the exchange, good quality of warehouses to store produce and if these warehouses are located in easily mobile areas
- Determining what will make the Banks accept receipts from farmers
- Determining the feasibility of an agricultural commodity exchange system in Ghana

## **Findings**

**Objective One: Determining if the warehouses in Ghana have adequate capacity and the quality of these warehouses.**

Through a survey conducted by the UNCTAD, the researcher estimates the total warehousing capacity in the major cities and towns in Ghana at over 1.3 million tonnes. The concentration of warehousing facilities is in Accra, as illustrated below in the pie chart below:



*Table Two: Bar Chart illustrating the warehousing capacity in the major cities of Ghana*

*Source: Private Study undertaken by the UNCTAD*

It is quite evident that provision of warehousing services is skewed towards the needs of imports and exports. Bonded warehouses, primarily for imports, and storage space dedicated to exports such as cocoa account for about 65% of the total storage capacity, while only 8.4% of the storage capacity is used for storing agricultural commodities. Storage capacity in commodity-surplus-producing areas represents only 1.5% of the available capacity. This will be woefully inadequate if the WRS and exchange trading is to impact on domestic trade in agricultural commodities.

This study further indicated that 89% of warehouses in the interior (Sunyani-Techiman) reported capacity utilization of above 50%, compared to 67% in Kumasi and only 54% in the Accra-Tema area. All the operators in Takoradi reported above 50% capacity utilization. However, there are indications if commercial demands for warehousing services in the commodity-surplus-producing interior increases, investors are likely to positively respond by investing in expansion of storage capacity in those areas.

There are clear indications that warehousing standards in the country are variable. The highest standards were found in the Sunyani-Techiman area, where about 50% of the warehouses surveyed were classified as Good and the remaining 50% above average. Respective figures for Takoradi were 28% and 58% with none of the warehouses being classified as "below average". However, in Kumasi, about 21% of the warehouses were classified as good while 50% were below average. In Accra-Tema, only 14% of the warehouses surveyed were classified as good, while a very high 53% were

below average. Staffing levels were adequate only in Takoradi and Sunyani-Techiman. In Accra-Tema and Kumasi, 48% and 21% respectively of the warehouses surveyed were manned by inadequate staff.

These deficiencies in the warehousing industry in the country, pose a major threat to the development of a credible WRS to support the proposed commodities exchange. They can be remedied with the institution and robust enforcement of appropriate warehousing standards and training for the industry personnel.

## **Objective Two: Determining what will make the Banks accept receipts from farmers**

### **Legitimacy of receipts**

In the review of WRS models, the researcher noted that the most common in Ghana is the unregulated commercial WRS, which is primarily based on collateral management agreements between banks and individual borrowers. The borrowers are usually relatively large-scale processors and traders and the system tends to be used to finance import and export trade. It is seldom accessible to medium and small-scale enterprises and is usually not for financing domestic trade in agricultural commodities. The contrast is the NGO/donor-funded inventory credit system, which was pioneered in Ghana by Technoserve. It is often targeted at smallholder farmers and for major staples such as maize. Scale diseconomies tend to limit the sustainability of this model. In both the unregulated commercial WRS and the

NGO/donor-funded inventory credit scheme, the receipts issued are non-transferable and non-negotiable and, therefore of limited use in promoting trade via exchanges.

The involvement of an independent regulatory agency is what distinguishes the regulated WRS from two other models. The independent regulator is responsible for licensing/certifying warehouse operators as custodians of collateralized stocks (ensuring that they comply with criteria set in relevant laws and regulations); regulating the issue of standardized warehouse receipts to minimize the risk of fraud; and overseeing the operations of warehouse operators (including carrying out unannounced stock and quality verifications). Licensed warehouse operators may include international as well as local inspection companies, and processing companies such as ginneries.

The regulated WRS model has features that overcome the limitations of the other model. An independent regulatory agency is responsible for licensing/certifying warehouse operators as owners of collateralized stocks regulating the issue of standardized warehouse receipts to minimize the risk of fraud; and directing the operations of warehouse operators. Hence, under this system, licensed operators can offer “public” warehousing services, implying they can store commodities on behalf of multiple depositors (of all size) in a single warehouse or site. The receipts issued may also be transferable and negotiable, depending on the enabling legislation and can therefore form the basis of trade contracts on the exchange. The regulated

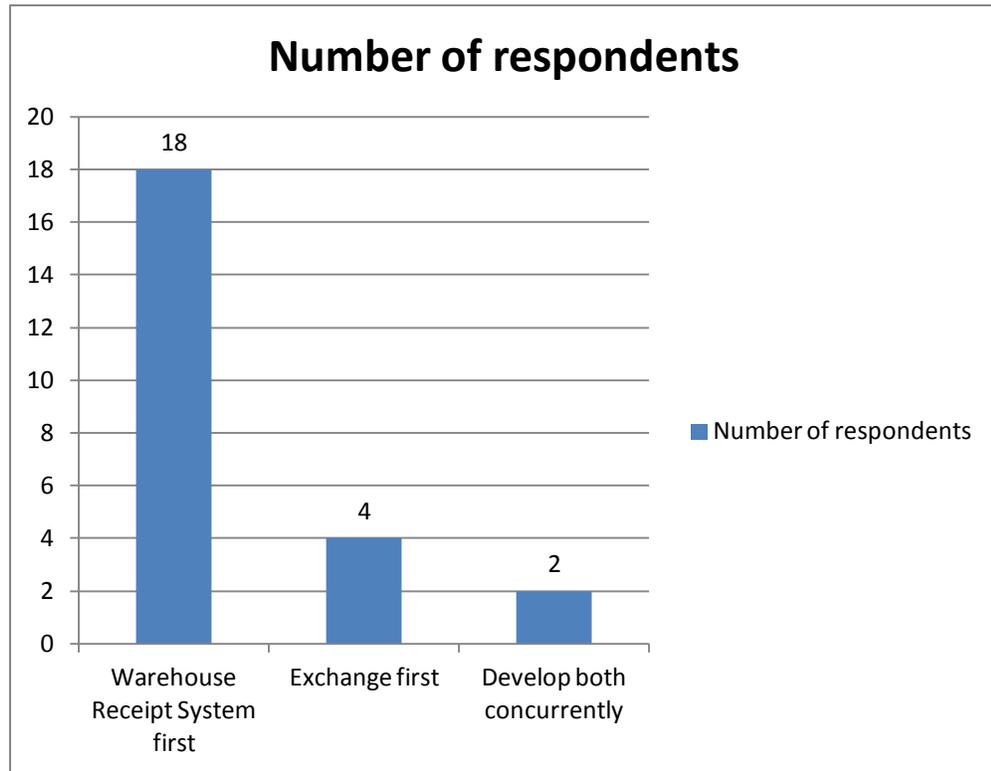
WRS was successfully piloted in Zambia under a project funded by the Common Fund for Commodities and has been adopted by the ECX in Ethiopia.

The six major banks interviewed in conducting this research said they would each accept the receipts if there were legitimate and had been through the right legislation procedures.

### **Objective Three: Determining the feasibility of an agricultural commodity exchange system**

The researcher reviewed types and experiences in promoting commodities exchanges and WRS, especially in developing countries and concluded that, considering conditions in the commodity sectors, the financial sector and the Ghanaian economy in general, that the exchange to be promoted – that is the Ghana Commodities Exchange (GCX) – should operate as a spot or cash exchange, trading contracts for immediate delivery such as standardized spot contracts for commodities, Repos and non-standard contracts for services such as transport and logistics. This system however, can only be implemented through the establishment of a credible WRS.

**Table 2: Bar chart representing the frequencies of the interviewees**



The above graph shows the opinions of the 24 interviewees needed to conduct this study. Out of the 24 interviewees, 18 of them believed the exchange can only be facilitating if a credible warehouse receipt system is developed. These respondents formed the major percentile and as such helped in determining the best means of employing the GCX. Two of the interviewees thought the exchange could concurrently be developed with the WRS. The remaining 4 were of the opinion that the exchange could be developed before the development of a credible WRS.

Through these findings, the researcher gathered that a credible WRS, which is robustly regulated by the exchange, is seen as absolutely essential to the operations of the GCX – this has proved to be the key missing link explaining the failure of many exchange initiatives in Africa. To complement the delivery system, a reliable, cost-effective and fast clearing and settlement system which guarantee payment for traded commodities needs to be developed. It is expected that this service will be offered by clearing members (financial institutions) of the exchange. The GCX will institute a transparent trading system consisting of an electronic trading platform and a network of credible brokers.

**Objective Four: Determining the capacity of existing institutions to conduct certification of the quality of grains**

The researcher, as part of this study, reviewed the Ghana Standards Board to determine the methods and grading standards used by this board in determining the quality of produce. This Board reviewed the methods and procedures in the following manner.

- Gathering of commodities
- Categorizing all commodities into different groups based on the type of commodity. For example, all tomatoes are grouped and so on.
- In the various categories, the agricultural commodities are tested based on size, overall attractiveness and purity
- After, they are segmented in the various categories and are graded.

- The highest quality segments of all the products are considered Grade A, medium-quality commodities are grade B and inferior commodities are Grade C.

The Ghana Standard Board is a highly organized institution in Ghana which can facilitate the implementation of the agricultural commodity exchange. In the beginning stages, they can be the main facilitating institution before training and the establishments of other Boards begin. This institution is a trusted one and has gained credibility in the market. For this reason, it will be very useful to use this Board as the main facilitator of the agricultural commodity exchange.

In conclusion, through the findings obtained from this study, the GCX will not be very feasible if the above conditions are not satisfied. Essentially, the credibility of the WRS will determine the development and sustaining of an agricultural commodity exchange system.

## **Other relevant findings**

In general, factors identified as discouraging banks in Ghana from providing commodity finance include the following:

- ❖ Small sizes of commodity finance deals
- ❖ Lack of appropriate legal and regulatory framework
- ❖ Weaknesses in the Banks' capacity and expertise
- ❖ Absence of organized market to provide price discovery and difficulty in liquidating the underlying asset in case of default due to the absence of a formal market
- ❖ Lack of commodity risk insurance products

Despite these concerns, banks surveyed expressed interest in a regulated warehouse receipt system as well as any mechanism that will enable them manage risks associated with commodity-backed lending.

## CHAPTER FIVE

### **Discussion**

Through the literature reviewed in this dissertation, the researcher deduced that the establishment of a commodities exchange and supporting warehouse receipt system (WRS) in the country will help transform commodity marketing and finance in the country as well as significantly improve management of post-harvest risks in some of the commodity sectors.

The main benefits of a commodity exchanges are only realizable in an environment where there is adequate infrastructure, a credible warehouse receipts system, and adequate financial regulation. Also, these systems function effectively when there is the efficient flow of information, an accommodating macroeconomic and financial environment, and effective contract enforcement. Also, the government should also support the agricultural commodity exchanges by refraining from controlling commodity markets.

A commodity exchange cannot develop and be sustained without sound policies for monetary management and foreign trade. In particular, macroeconomic policy needs to maintain stable reasonable, real interest rates undistorted, exchange rates and inflation rates relatively stable.

The establishment of Agricultural commodity exchanges has been considered to be a potential market-based mechanism for commodity price risk management. The idea of a commodity exchange is very accommodating

and necessary in creating some improvements in the agricultural sector. However, this system does not work well with all countries, especially in the African countries. This thesis reviews the benefits, enabling conditions and the technical feasibility of such a system in Ghana.

The strategic choice of whether to develop a WRS before establishing an exchange or vice versa is sometimes debated. Nigeria, Malawi and Uganda opted for an exchange first approach and are struggling to attract significant volumes of trade. Tanzania and Zambia chose the option first developing the WRS but the development of the system has been rather slow due in part to perceived problems with liquidating the underlying in the absence of a commodities exchange. The recently incorporated Ethiopia Commodity Exchange (ECX) is combining the development of exchange trading with the WRS. The researcher proposes that Ghana should adopt the Zambia and Tanzania model of establishing a credible Warehouse Receipt system before developing the exchange mainly because this will ensure banks, farmers and buyers the needed security to trade.

## Recommendations and Conclusions

A credible WRS which is robustly regulated by the exchange is seen as absolutely essential to the operations of the GCX – this has proved the key missing link explaining the failure of many exchange initiatives in Africa. The researcher proposes that only warehouse operators who meet the following requirements are licensed:

- Reputable track record in management of third party collateral (in the form of stored commodities).
- As a condition for licensing, the operator shall be in possession of a valid insurance policy, issued in his name, and providing cover for the warehouse and the commodities stored therein for their full value at risk and against fire and allied risks, burglary and employee infidelity. It is important to ensure that that licensed warehouse operator grants a first lien to the GCX on the proceeds of insurance policies so that the GCX can ensure that the operator meets obligations to all holders of Warehouse Receipts in priority to any other claims.

Currently, only the registered collateral management firms will be able to meet the criteria proposed above but this has two main advantages: first, their reputation will foster confidence in the WRS and related trade and

financing contracts; and second it will reduce the scale of external oversight of warehouses by the GCX. However, as the system develops and gains credibility, new entrants, who are not dedicated collateral managers can participate as is the case in South Africa. However, these have to meet more stringent licensing requirements which will be determined by stakeholders.

To complement the delivery system, a reliable, cost-effective and fast clearing and settlement system which guarantee payment for traded commodities needs to be developed. It is expected that this service will be offered by clearing members (financial institutions) of the exchange. The GCX will institute a transparent trading system consisting of an electronic trading platform and a network of credible brokers.

The WRS-based delivery system as well as the trading and clearing/settlement systems will be underpinned by rules and procedures which assure effective contract enforcement and therefore reduce non-performance risk. To complement these, the proposed GCX would also be required to institute an arbitration/mediation system which leads to quick, fair and low-cost resolution of trade disputes. The researcher further proposed that a very reliable market information system should be developed in order to enable market payers make knowledgeable trade decisions.

The GCX – that is the Ghana Commodities Exchange (GCX) – should in the short term operate as a spot or cash exchange, trading contracts for immediate delivery such as standardized spot contracts for commodities.

In the short term the WRS and exchange trading should focus on durable commodities such as the cereals (maize, rice and sorghum); oils and oilseeds (groundnuts and palm oil); export crops such as cashew, cotton lint/seed, coffee and natural rubber. In the medium term there is the potential to receipt and trade locally-processed cocoa through the exchange, especially if there a change in Government policy. Fruit juice concentrate and frozen fish, which require reliable temperature-controlled storage, may also be included, possibly in the medium term if appropriate storage facilities and stable supply of electricity can be assured.

Even though there is substantial spare capacity in the major urban areas such as Accra, Tema and Kumasi, there is under-supply of storage capacity in the major surplus-producing areas. This constitutes a major constraint in the aggregation of commodities by traders and farmer groups. For this reason the researcher proposes the Government encourages investment in expanding suitable storage infrastructure in the surplus-producing areas through schemes that ease access to land and offer attractive tax incentives for investors.

From the research analysis, it is technically feasible to develop the proposed GCX model in Ghana because the fundamental physical and institutional structures as well as required services are available. Further investment is required in, especially, physical warehouse infrastructure in surplus-producing and in improving the institutional infrastructure for delivery of market information, quality and quantity assurance, sustained building of the capacity of key players and fast, low-cost resolution of trade

disputes. The entire economy of Ghana stands to gain significant benefits and the researcher urges promoters of the exchange to continue to pursue this vision.

## **Bibliography**

*About us.* (2009). Retrieved December 15, 2011, from Ghana Statistical Service: <http://www.statsghana.gov.gh/AboutUs.html>

*AGRICULTURAL SECTOR.* (2011). Retrieved December 15, 2011, from Inter African Development Bank: <http://www.iadb.org/en/about-us/agricultural-sector,6211.html>

Andani, A. (2011, October 7). *Stanbic, Commercial Bank Of China Sign Pact.* Retrieved December 15, 2011, from Daily Guide: <http://www.dailyguideghana.com/?p=29107>

Black, D. 1986. Success and failure of contracts: Theory and empirical evidence. Monograph Series in Finance and Economics 86-1. New York: New York University.

Breisinger C., X. Diao, J. Thurlow and R.M. Al-Hassan (2008) "Agriculture for development in Ghana: new opportunities and challenges", IFPRI Discussion Paper 00784.

*Commodities Market.* (2012). Retrieved December 1, 2012, from Financial Technologies Knowledge Management Corporation: <http://www.ftkmc.com/commodities.html>

*Commodity Exchange In The Offing.* (2010, December 10). Retrieved August 26, 2011, from Ghana Government Official Portal: [http://www.ghana.gov.gh/index.php?option=com\\_content&view=article&id=4163:commodity-exchange-in-the-offing&catid=23:business&Itemid=164](http://www.ghana.gov.gh/index.php?option=com_content&view=article&id=4163:commodity-exchange-in-the-offing&catid=23:business&Itemid=164)

Garcia, P. and R. Leuthold, 2004, A Selected Review of Agricultural Commodity and Options Markets *European Review of Agricultural Economics* 31(3): 235-272.

*Ghana Business Index, The Ghana Business Index Centre.* (2007, December 20). Retrieved December 12, 2011, from Ghana Commercial Bank Limited: [http://business.everythinghana.com/index.php?option=com\\_mtree&task=viewlink&link\\_id=23&Itemid=26](http://business.everythinghana.com/index.php?option=com_mtree&task=viewlink&link_id=23&Itemid=26)

Hieronymus, Thomas A. *Economics of Trading for Commercial and Personal Profit* New York: Commodity Research Bureau, Inc., 1977.

Khor, M. (2006). The impact of globalization and liberalization on agriculture and small farmers in developing countries: The experience of Ghana

Mangudhla, T. (2011, December 10). *Ecobank launches benchmark index*. Retrieved December 19, 2011, from Daily news: <http://www.dailynews.co.zw/index.php/business/35-business/5922-ecobank-launches-benchmark-index.html>

*New exchange to change face of trade in west Africa*. (2008). Retrieved October 7, 2011, from CommodityOnline: [http://anacardium.info/IMG/pdf/COMMODITY\\_EXCHANGE\\_IN\\_GHANA.pdf](http://anacardium.info/IMG/pdf/COMMODITY_EXCHANGE_IN_GHANA.pdf)

Onumah G. and A. Aning (2009) "Feasibility study towards establishment of commodities exchange in Ghana: Final Report" undertaken on behalf of the Securities and Exchange Commission, Accra, Ghana August 2009.

Onumah, M. G. (2009). *Promoting Agricultural Commodity Exchanges* . Retrieved November 5, 2011, from United Nations Unctad: [http://www.unctad.info/upload/SUC/EcowasGhanaCerealMarkets/Presentations/COMEX\\_Report\\_Onumah\\_en.PDF](http://www.unctad.info/upload/SUC/EcowasGhanaCerealMarkets/Presentations/COMEX_Report_Onumah_en.PDF)

Professor Nisha Singh, P. S. (2011) '*DEVELOPMENT OF COMMODITY MARKETS:USA and INDIA*'. Retrieved November 1, 2011, from uPublish.info: <http://www.upublish.info/Article/-DEVELOPMENT-OF-COMMODITY-MARKETS-USA-and-INDIA-/660927>

Sarantakos .S. (2005) *Social Research Methods* 3<sup>rd</sup> Ed (Palgrave Macmillan, New York)

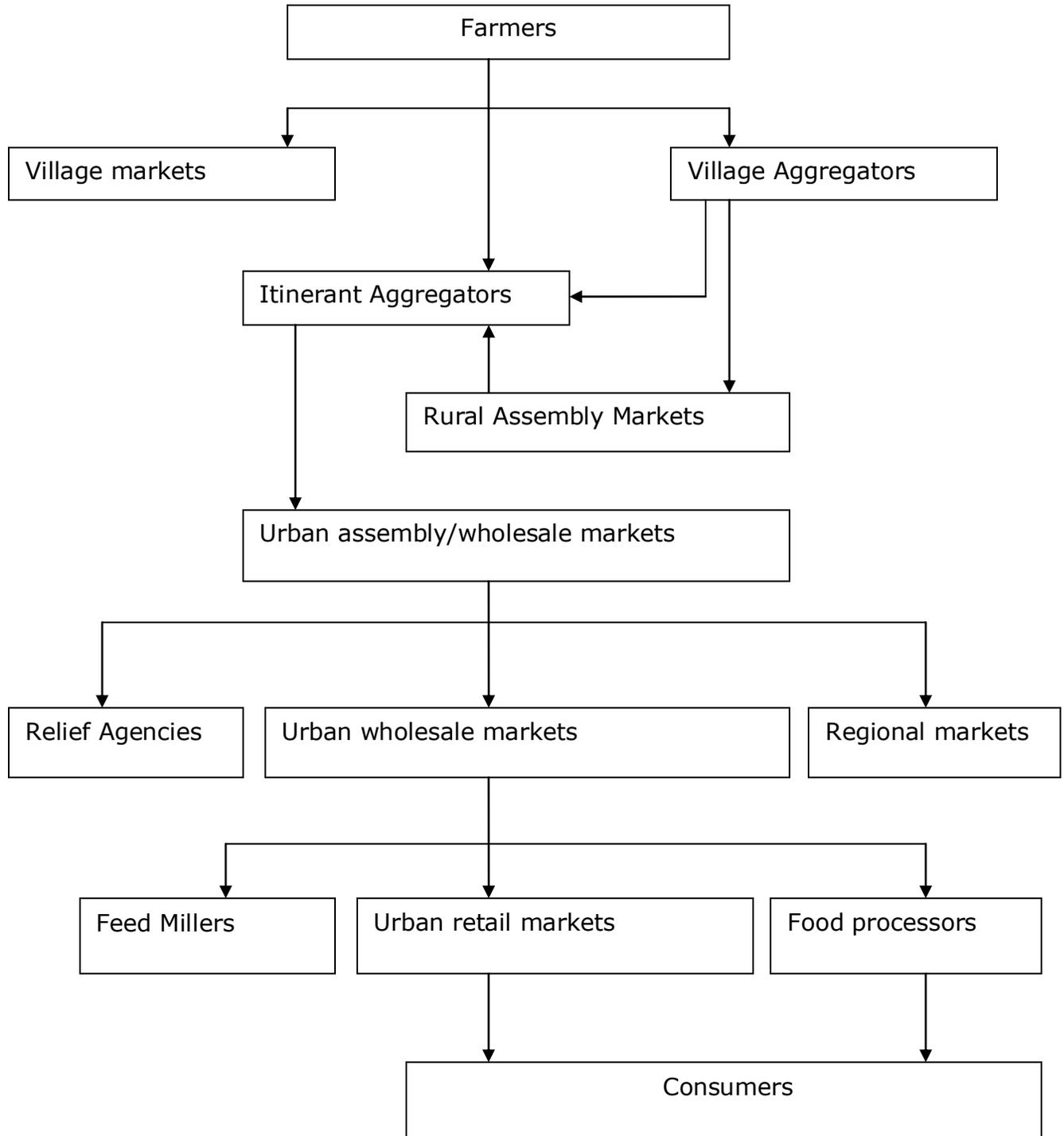
Shahidur .R. Winter .A. Garcia P. (2010) *Purposes and of Agricultural Commodities Exchanges in Africa* Retrieved November, 2010

Way, Z. (2010). *Five questions about fair trade coffee*. Retrieved September 13, 2011, from Nuzza Resources: <http://www.nuzza.com/resources/five-questions-about-fair-trade-coffee.html>

**Appendix**

Table 1: Ghana's Maize Marketing Chain

*Source: Onumah and Aning (2009).*



Guidelines for Interviews

Commodity Exchange Experts

1. How many warehouses are located in Ghana?  
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2. What is the storage capacity of these warehouses?  
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3. How many of these warehouses are large enough to store agricultural produce for local consumption?  
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4. What is the average size of a warehouse in Ghana?  
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.....
5. What is the quality of these warehouses? (ie. adequate lighting , necessary temperature for agricultural storage, security)  
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.....
6. What agricultural products qualify to be on the exchange?  
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.....
7. Why do these products qualify to be on the exchange?  
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.....
8. What steps have been considered in order to encourage the adoption of a commodity exchange system?  
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.....
9. Should the commodity exchange be started before or after the development of a credible WRS?  
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Guidelines for Bank interviews

1. Will the bank be willing to accept warehouse receipts from farmers?

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2. Under what conditions will the bank be willing to accept the receipts?

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3. Is the bank already putting measures in place for such a system?

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4. How will the bank be able to determine the legitimacy of the receipt?

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5. Has the bank adopted any steps to ensure the receipts from the farmers are legitimate and trustworthy?

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6. What are the characteristics of a legitimate receipt?

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7. How will this bank assure that there will be enough funds pushed into the agricultural sector to ensure the success of such a system?

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8. Should the commodity exchange be started before or after the development of a credible WRS?

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Interview Guidelines for the Stanbic Bank Representatives

1. As a result of their affiliations with commodity exchange, does the bank think they will be willing to adopt such a system in Ghana?  
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2. Under what conditions will the bank be willing to accept the receipts?  
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3. How does the bank intend on dealing with settlements of the farmers?  
.....  
.....
4. Is the bank already putting measures in place for such a system?  
.....  
.....
5. Will the bank be willing to accept warehouse receipts from farmers?  
.....  
.....
6. How will the bank be able to determine the legitimacy of the receipt?  
.....  
.....
7. Has the bank adopted any steps to ensure the receipts from the farmers are legitimate and trustworthy?  
.....  
.....
8. What are the characteristics of a legitimate receipt?  
.....  
.....
9. How will this bank assure that there will be enough funds pushed into the agricultural sector to ensure the success of such a system?  
.....  
.....
10. Should the commodity exchange be started before or after the development of a credible WRS?  
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Interview Guidelines for the Ministry of Agriculture Representatives

1. How many warehouses are located in Ghana?  
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2. What is the storage capacity of these warehouses?  
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.....
3. How many of these warehouses are large enough to store agricultural produce for local consumption?  
.....  
.....
4. What is the average size of a warehouse in Ghana?  
.....  
.....
5. What is the quality of these warehouses? (ie. adequate lighting , necessary temperature for agricultural storage, security, etc)  
.....  
.....
6. What agricultural products qualify to be on the exchange?  
.....  
.....
7. Why do these products qualify to be on the exchange?  
.....  
.....
8. What steps have been considered in order to encourage the adoption of a commodity exchange system?  
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9. Should the commodity exchange be started before or after the development of a credible WRS?  
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.....
10. Should the commodity exchange be started before or after the development of a credible WRS?  
.....  
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Interview Guidelines for the Ghana Standards Board Representatives

1. What qualifies the grades of the products?

.....  
.....

2. How will the standards of the agricultural produce be checked?

.....  
.....

3. Does the Ghana Standards Board have the sufficient capacity to ensure quality and grades of all the different commodities?

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.....

4. What steps have been considered in order to encourage the adoption of a commodity exchange system?

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.....

5. Should the commodity exchange be started before or after the Development of a credible WRS?

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