

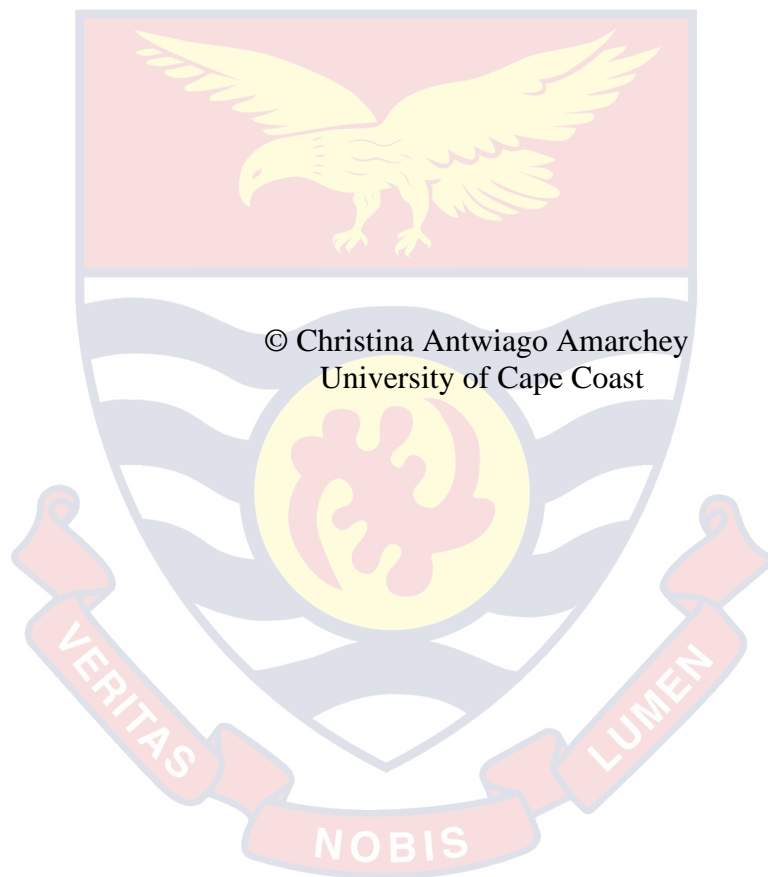
UNIVERSITY OF CAPE COAST

FOOD PRODUCE MARKETING AND AGRICULTURAL GROWTH IN
THREE SELECTED DISTRICTS IN THE BRONG AHAFO REGION OF



CHRISTINA ANTWIAGO AMARCHEY

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FOOD PRODUCE MARKETING AND AGRICULTURAL GROWTH IN
THREE SELECTED DISTRICTS IN THE BRONG AHAFO REGION OF
GHANA

BY

CHRISTINA ANTWIAGO AMARCHEY

Thesis submitted to the Department of Integrated Development Studies of the
School for Development Studies, College of Humanities and Legal Studies,
University of Cape Coast, in partial fulfilment of the requirements for the
award of Doctor of Philosophy degree in Development Studies

DECEMBER 2020

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature:..... Date:.....

Name:

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor's Signature:..... Date:.....

Name:

Co-Supervisor's Signature:..... Date:.....

Name:

ABSTRACT

Agricultural growth is important for poverty reduction in developing countries, especially those that have agrarian economies like Ghana. The purpose of the study was to investigate the contribution of food produce marketing to agricultural growth in three selected districts in Brong Ahafo Region of Ghana. The study analysed the efficiency of the food produce marketing system from two perspectives—spatial market integration and relationship quality between farmers and traders—to find how the level of market efficiency provides an incentive for smallholder food crop farmers’ decision to produce more. The selected study districts were Asutifi South District, Tano North District and Techiman Municipality. The study applied the mixed methods approach and used both quantitative and qualitative research methods as well as relying on the descriptive and cross-sectional survey approaches. The sample size of the study was 348 comprising 269 farmers and 79 traders. The findings showed that both plantain and tomato markets are integrated spatially, albeit weakly in the Brong Ahafo Region, signifying weak market efficiency. There is also an overall good quality relationship between food produce farmers and their traders which implies good market efficiency. Majority of the farmers are risk neutral and decide to increase production for the market as their response to the market signals. The study recommends that the Ministry of Food and Agriculture strengthens the implementation of its policy to reach farmers with extension education to enable them to effectively engage the market for increased production and farm profits to reduce poverty.

KEY WORDS

Agricultural growth

Food produce marketing

Relationship quality

Smallholder farmers

Spatial integration

Traders



ACKNOWLEDGEMENTS

With great appreciation, I would like to acknowledge my supervisors, Prof. Francis Enu-Kwesi and Prof. Akua Opokua Britwum under whose tutelage I was privileged to have gone through this journey. Words cannot express my gratitude for the valuable advice, supportive guidance and all the excellent contributions that they generously offered me.

I am also indebted to the lecturers and the support staff of the School for Development Studies of the College of Humanities and Legal Studies for your constructive criticisms, encouragement and friendship that facilitated this work in no small measure. I thank my colleagues and friends for their encouragement, criticisms and support in diverse ways which made the work lighter.

I am grateful to my late mother who believed in me and planted in me resilience and hard work and my late father who died when I was very young yet his can-do spirit left an indelible mark in my life and this inspired me to pursue this course. My gratitude also goes to my wonderful siblings - Isaac, Florence and Dinah - whose encouragement, love and supportiveness have been my backbone. I thank Rev. Prof. Seth Asare Danso for his immense support that encouraged me to continue to the end.

DEDICATION

To the memory of my parents,

Samuel Dortor and Rose Boaa Amarchey



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LIST OF ABBREVIATIONS

AAGDS	Accelerated Agricultural Growth and Development Strategy
ADF	Augmented Dickey-Fuller
AgSSIP	Agricultural Subsector Services Investment Programme
ANOVA	Analysis of Variance
ASDA	Asutifi South District Assembly
CAADP	Comprehensive Africa Agriculture Development Programme
CMB	Cocoa Marketing Board
ECOWAS	Economic Community of West African States
ECOWAP	ECOWAS Agriculture Policy
FASDEP	Food and Agriculture Sector Development Policy
FAO	Food and Agriculture Organisation
FBO	Farmer-Based Organisation
GD	Group Discussion
GDP	Gross Domestic Product
GFDC	Ghana Food Distribution Corporation
GMB	Grains Marketing Board
GNTF	Ghana National Trade Policy
GPRS	Ghana Poverty Reduction Strategy
GSGDA	Ghana Shared Growth and Development Agenda
GSS	Ghana Statistical Service
GWC	Grain Warehousing Company
HIPC	Highly Indebted Poor Country
IMF	International Monetary Fund

KII	Key Informant Interview
KMO	Kaiser-Meyer-Olkin
MDG	Millennium Development Goal
METASIP	Medium Term Agriculture Sector Investment Plan
MTADP	Medium Term Agricultural Development Programme
MoFA	Ministry of Food and Agriculture
MoTI	Ministry of Trade and Industry
OLS	Ordinary Least Square
SAP	Structural Adjustment Programme
S-C-P	Structure-Conduct-Performance
SPSS	Statistical Product and Service Solutions
TNDA	Tano North District Assembly
TSSP	Trade Sector Support Programme
VIP	Village Infrastructure Project



CHAPTER ONE

INTRODUCTION

The literature indicates how agricultural growth is important for poverty reduction and economic development in developing countries. Byerlee, Diao and Jackson (2005) emphasise that agricultural growth provides the foundation for enhanced economic development at the early stages of development as well as the link to poverty reduction. The influence of agricultural marketing has also been found to be vital for agricultural growth and poverty reduction (Nuhu, Ani & Bawa, 2009; Thirtle, Irz, Lin, McKenzie-Hill & Waggins, 2001). It is observed in most African countries that agricultural growth has been slow largely due to the inefficient food produce marketing systems (Coulter & Onumah, 2002; Ngeleza & Robinson, 2011).

Improving market efficiency is important in food produce marketing because it forms the basis by which farmers respond with agricultural production and marketed surplus (Alam & Begum, 2007). Measuring market efficiency from both econometric and behavioural perspectives gives a wholistic view of the market as a socio-economic structure. Available studies on supply response of farmers to the market over-emphasise the economics of the functioning of markets without incorporating the social nature of markets due to the influence of neoliberal theory. The position of this research is that studying the efficiency of food produce markets using both spatial integration and relationship quality between farmers and traders is crucial in assessing the contribution of food produce marketing towards agricultural growth.

Background to the Study

The role of agriculture in the economic growth of developing countries has been found to be important in several ways. It is the main source of food, raw materials for industries and employment for many citizens in these countries (Thirtle et al., 2001; OECD, 2006; Seini, 2002). There is a lot of theoretical and empirical evidence that show that agricultural growth is essential, especially in poor developing countries whose economies are mainly agrarian (Blein et al., 2013).

Agricultural growth has been used to measure the performance of the agricultural sector (Byerlee, Diao & Jackson, 2005). The agricultural growth literature indicates that agricultural growth is derived from a number of sources which have been categorised into three main components. The components include changes in real prices of agricultural produce, increased land area put under agriculture and greater yields (Fuglie, 2010; Nkamleu, 2007). Fuglie points out that area and yield growth result in a larger quantity of output or real output growth whereas higher real prices or improved terms of trade increase the value of the same quantity of output.

The quantity of output or production and productivity, which is output per unit of input, are commonly used as indicators to measure agricultural growth in many studies (OECD, 2006). According to Meijerink and Roza (2007) and de Janvry and Sadoulet (2009), growth is generated mainly through productivity gains, especially land and labour productivity, which normally result from the adoption of new technology or farming practices. As a result,

existing studies in agricultural growth have concentrated more on productivity than on production.

In addition, market systems and processes that influence farmers' decision to shift resources into other commodities are identified as sources of productivity growth (Pinto, 2008; Poulton, Kydd & Dorward, 2006). Thus, while prices from marketing processes influence the real prices component of agricultural growth directly, they appear to have indirect influence on the area and yield components (Fuglie, 2010). Though the term agricultural growth is broad, this study concentrates on the influence that food produce marketing may have on the decisions of farmers to produce which is critical in poverty reduction and development.

Development has been described as a process of change towards improving human living conditions that has been going on since time immemorial (Kendie, 2011). It has been discussed in diverse perspectives with evolving conceptualisations and multiple meanings over the years. Development has thus been associated with various objectives including poverty reduction (Todaro & Smith, 2012). Subsequently, Ince (2019) notes that the varied, and even contradictory objectives of development are linked by the basic belief that it is possible to improve material conditions of human life through deliberate human agency.

Poverty reduction has been recognised as the major objective of development efforts by the development community (Byerlee, de Janvry & Sadoulet, 2009). Consequently, eradicating poverty in all its forms and dimensions has been expressed as important in the Sustainable Development

Goals to build on the Millennium Development Goals and complete what could not be achieved (UN, 2015). This is against the backdrop that poverty reduction and development have long been critically linked to agricultural growth (AGRA, 2017).

Agricultural growth provides the foundation for enhanced economic growth and development at the early stages of development as well as the link between economy-wide growth and poverty reduction (Byerlee et al., 2005). In this regard, de Janvry and Sadoulet (2009) emphasise that agricultural growth can serve as an important instrument for poverty reduction and be even three times more effective in reducing poverty than growth that originate in the rest of the economy. In particular, Diao, Fan, Kanyarukiga and Yu (2010) observe that agricultural growth that is driven mainly by increased productivity in food crop subsector produces the greatest effect on poverty reduction.

According to Byerlee et al. (2009), it is expected that in the relatively early stages of development, agriculture must perform two crucial functions. First, it must generate and release in sufficient quantities and on reasonable terms the surplus that is necessary if growth is to take place outside the agricultural sector as well. Secondly, it must contribute to the creation of a domestic market (Gollin, 2009). These functions are in line with the arguments of both classical liberal economists and neoliberal development economists. The classical liberal and classical neoliberal economists posit that a systematic resource reallocation from a low-productivity, traditional technology, decreasing returns, mostly agricultural sector to a high-

productivity, modern, increasing returns, mostly industrial sector is necessary for economic development (Jedwab & Osei, 2012).

Neoliberal development economists further assume that development in an open economy would move on faster and more efficiently (Adelman, 1999; Adelman & Morris, 1997; Byerlee et al., 2005). In the view of Todaro (2002) and Neill (2008), neoliberal development theorists emphasise trade to the extent that they suggest that international trade can provide a substitute for low domestic aggregate demand.

According to Timmer (2005), the key strategic elements of agricultural development have been identified as far back as the mid-1960s by Mosher (1966) and Schultz (1964). The key elements are new agricultural technology and incentive prices in local markets. Timmer argues that these combine to generate profitable farm investments and income streams that simultaneously increase commodity output and lift the rural economy out of poverty. The identified elements reflect the assumptions of the liberal development theory that technology and institutions are crucial to the process of resource reallocation.

In a comparative analysis of the history of development, Adelman and Morris (1997) reveal that countries that industrialised first had the most developed market institutions. This affirms the fact that institutional factors such as market expansion and changes in production relations which result from the adoption of technology are key factors in the developmental process (Hoff & Stiglitz, 1999; Neill, 2008). It could thus be argued that improvements in technology must necessarily go with the requisite

advancement in institutional arrangements such as agricultural marketing to engender economic development and development in general.

Drucker (1958) describes marketing as the driving force in economic development and argues that marketing promotes development by creating standards and by developing managers and entrepreneurs. Subsequently, Watson (1996) points out that marketing is not just an activity taking place beyond the farm gate but an important part of farmer decision-making regarding resource allocation, as postulated by the neoliberal household decision-making theory. In this wise, farmers have responded to modern agricultural technology in terms of their access to resources and the uncertainty of environments such as markets (Nkamleu, 2007). Therefore, as Mensah-Bonsu, Agyeiwaa-Afrane and Kuwornu (2011) argue, efficient marketing institutions should develop at the right time and place, for the production process to improve in order that agricultural growth is realised.

According to Ahmad (1995), agricultural marketing is the main force which helps in linking subsistence agriculture to the urban market centres and this helps to transform it into a vibrant, dynamic and progressive sector of the national economy. Efficient movement of agricultural produce from the farm to consumers can produce benefits to both farmers and consumers (Landes & Burfisher, 2009). Thus, Landes and Burfisher further posit that more efficient agricultural marketing has the potential of reducing poverty, in that, it engenders economy-wide gains in output and wages and increases agricultural producer prices. Moreover, it reduces consumer food prices and promotes

private consumption, especially by low-income households in the particular case of food produce marketing (Diao et al., 2010).

Food produce marketing is part of broad agricultural marketing and involves the marketing of farm produce that is utilised as food by humans and comprises of both crop and animal production (Diao et al., 2008). It includes everything that happens between the farm-gate and the consumer such as production planning, transforming, grading, storing, transporting and distributing food produce and its related services (Mohy-ud-Din & Badar, 2011; Uduji, Oyaka & Edicha, 2012). Aina, Ajijola, Bappah, Ibrahim and Musa (2012) stress that it begins at the farm level when the farmer plans his production to meet specific demands and market prospects.

Improved food produce market efficiency contributes to poverty reduction also in the sense that it reduces the degree of price fluctuations farmers and poor consumers experience and raises the mean price farmers receive (Poulton, Kydd & Dorward, 2006). Additionally, food produce marketing contributes to poverty reduction by increasing demand for consumer goods and services, and stimulating growth in the non-farm economy and improving employment for poor rural people (OECD, 2006). Furthermore, food produce marketing makes food available and accessible to meet the increased demand for food by the non-farming sector and ensures food security (Landes & Burfisher, 2009; Poulton et al.).

The development of food produce marketing has been found to be an important aspect of economic development. According to the neoliberal theory, the agricultural sector is expected to supply resources for the start of

industrialisation and with further growth, later to release labour and provide a mass market for domestic manufactures (Adelman, 1999; Barrett & Mutambatsere, 2005). Therefore, Jedwab and Osei (2012) argue that in developing countries, the growth and expansion of the agricultural and industrial sectors are closely linked to and dependent on the efficient and well-established marketing system. In this sense, food produce marketing thus becomes the vehicle for economic transformation.

Furthermore, the agricultural household decision making theory offers an explanation for the relationship between agriculture and industry in the context of food produce marketing. The theory seeks to highlight the decisions farmers make on issues broadly categorised as production, consumption, and market participation (Taylor & Adelman, 2003; William, 2003) which eventually determine the extent to which agriculture releases raw materials and labour to the industrial sector. Poulton et al. (2006) posit that if food produce marketing is efficient and operates with the necessary infrastructure and knowledge, it will support productivity growth and make available the needed raw materials for industries and thereby engender economic growth and poverty reduction.

More efficient domestic food produce marketing may also boost net food exports for foreign exchange earnings as food produce productivity and production increases (Adelman & Morris, 1997). Studies have also shown that improvement in market access increases food produce productivity, firstly by facilitating specialisation and exchange transactions in rural areas, and secondly through intensification of input use (Kamara, 2004). Wongnaa,

Mensah, Ayogyam, Asare-Kyire and Zu (2014) as well as van Asselt, Masias and Kolavalli (2018) thus assert that efficient food produce marketing system is necessary to incentivise production, enterprise and specialisation at the farm household level for improved productivity of all sectors of the economy.

Another contribution that food produce marketing makes to agricultural growth is in the area of knowledge gain. Generally, agricultural extension education enables farmers to adopt improved technologies and also become better entrepreneurs towards improving agricultural productivity (Nkamleu, 2007; Watson, 1996), which is consistent with the neoliberal theory. The introduction of the Structural Adjustment Programme (SAP) based on the neoliberal theory, has exposed both farmers and consumers to market forces such that making farmers aware of marketing realities through the use of agricultural marketing extension has become all the more necessary (FAO, n. d.).

In analysing the efficiency of agricultural markets, economists agree theoretically that market conditions such as information symmetry enable markets to get close to reaching economic efficiency defined by competitive conditions (Dercon, 2003; Vercelli, 2006). In line with agricultural marketing theory, it has been identified that efficiency of markets depends, among other things, on the number of traders, the level of competition among them and on the amount and costs of information at their disposal (Federico, 2007; Mensah-Bonsu et al., 2011).

McMillan (2007) and Jensen (2009) indicate that mechanisms for signaling and screening as well as in some cases, government-set rules and

regulations enhance informational symmetries. In this regard, Ortiz, Campbell and Hyman (2010) note in the case of food produce marketing that market information is transmitted mainly by traders with some done by government and other organisations. This means that traders, farmers and other participants of the marketing system may have access to market information to varying levels which may have implications on their behaviour and the levels of risk they may experience.

The risk theory therefore helps to understand the risk factors faced by both farmers and traders and the coping strategies they adopt that sustain them in the food produce marketing system (Adimabuno, 2010; Franken & Pennings, 2005). Robinson and Kolavalli (2010a) also identify that the standardisation practices in the food produce marketing system enhance the relevance of market information and enable participants in food produce marketing to operate with less transaction costs. Applying the relationship marketing theory to food produce marketing, it becomes imperative that once there is improved quality of the buyer-seller relationships, farmers and traders better share information and coordinate supply and demand which reduces transaction costs and creates a mutually satisfying long-term trade (Maxim, 2009; Sahara, Gyau, Stringer & Umberger, 2013).

The Local Governments or District Assemblies also influence the food produce marketing system and can limit the control level that the trader associations have over the market (Lyon, 2003). The District Assemblies are responsible for the planning of new market structures and they set up laws or town planning regulations regarding where trading activities can take place as

well as bye-laws on certain market practices (Ortiz et al., 2010; Porter, Lyon & Potts, 2007). Britwum (2013) notes that the observance of the statutory duty of District Assemblies to assist traders in their localities with regulatory and monitoring mechanisms may provide the basis for the authority of trader associations to operate in designated market places.

Improving the efficient functioning of agricultural markets, particularly for food produce, has become imperative since it seems to hold the missing link for the anticipated agricultural transformation in many developing countries (Byerlee et al., 2005; Poulton et al., 2006). The issues discussed above are similarly important to Ghana, and Ghana's agricultural marketing has gone through various transformations since the colonial days as policy directions to improve the sector changed over the years (Meijerink & Roza, 2007).

The government has used market interventions of price and non-price nature as important instruments for the development of the national economy since the 1960s. The government set up parastatals to fix prices for agricultural inputs and outputs as well as manage their distribution (Khor & Hormeku, 2006; Lyon, 2000). There were parastatals for export crops like cocoa and cotton and for major food staples and livestock. Subsequently, Dewbre and Borot de Battisti (2008) observed that both the prices farmers received for their output and those they paid for purchased inputs were largely influenced by government procurement, subsidy and trade policies.

With regards to the food crop subsector, various marketing institutions have existed under different titles but essentially with the same objectives

during the 1960s and the 1970s. Seini and Nyanteng (2003) write that they were to promote food production through pricing and marketing policies in favour of food producers and to ensure effective distribution of food throughout the country. Additionally, they were to provide market outlets for farmers located in remote villages. The government established the Ghana Food Distribution Corporation (GFDC) in 1971 to purchase and sell food produce such as maize, rice, yam, cowpea and groundnuts as well as the Grain Warehousing Company (GWC) in 1975 with the objective to store and distribute cereals (Ortiz et al., 2010).

As part of Ghana's trade liberalisation programme, guaranteed minimum prices for some food produce like maize and rice that had been operated by the state marketing institutions, were abolished in 1990 and the free market forces have been used to determine their prices ever since (Seini, 2002). The policy reforms of market deregulation, including agricultural markets implemented since the 1980s have considerably changed the policy and market context in which farmers in the country operate (Asuming-Brempong, 2004; Dewbre & Borot de Battisti, 2008). A Structural Adjustment Programme (SAP), advocated and funded by the World Bank and International Monitoring Fund (IMF), was introduced in 1983 to basically reduce government intervention and allow a free market mechanism to operate (Ofosu-Asare, 2011).

During the implementation of SAP in Ghana, the parastatals that dealt in food marketing were dissolved entirely (Khor & Hormeku, 2006). Other policies and programmes formulated by government in various periods to

ensure the growth of the agricultural sector indicated the intention to address issues relating to agricultural marketing. These included the Food and Agriculture Sector Development Policy (FASDEP) I which was prepared in 2002 and was followed by FASDEP II in 2007 (Dzanku & Aidam, 2013; Ministry of Food and Agriculture [MoFA], 2002; MoFA, 2007).

Ghana's trade policy from 2006 to 2010 had a two-prong strategy. It was one of an export-led industrialisation strategy as well as a domestic market-led industrialisation strategy based on import competition. This was in line with the neoliberal theorists' stress that international trade was able to expand the market for a country when its domestic aggregate demand was low (Adelman & Morris, 1997). Ghana thus participated in the Economic Community of West African States (ECOWAS) customs union with the hope of getting access to a larger market, thereby promoting investment and industrialisation (WTO, 2010). The increased regional competition was supposed to bring down prices and ensure a greater range of both imports and local products for the benefit of consumers and producers (Ministry of Trade and Industry [MoTI], 2012).

The policies on privatisation and withdrawal of state support in marketing channels of food produce presented an opportunity for informal market channel participants like local traders to expand their coverage when a vacuum was created in the domestic market (Khor & Hormeku, 2006). The traders are mostly women who engage in the distribution of food produce in rural and urban markets and whose activities have been a key feature of the informal domestic food produce marketing system in Ghana (Britwum, 2013;

Ortiz et al., 2010). It is expected that if the food produce marketing system is efficient it could serve the remotest part of food producing areas and give smallholder farmers the incentive to produce more and thereby engender poverty reduction and development.

More especially, areas producing the bulk of food produce including the Brong Ahafo Region with a large number of smallholder farmers whose living conditions could be impacted positively by efficient food produce marketing system may need attention. The Brong Ahafo Region is acclaimed to be a food basket of the country (Songsore, 2010), being the largest producer for three key staples – tomato (*Solanum lycopersicum*), maize (*Zea mays*) and yam (*Dioscorea*) - based on a 3-year average production for the 2013-2015 period. In addition, it is the second largest producing region for plantain (*Musa paradisiaca*) and cassava (*Manihot esculenta*) as well as the fourth and fifth producing region for cowpea (*Vigna unguiculata*) and sorghum (*Sorghum bicolor*) respectively (Dzomeku, Dankyi & Darkey, 2011; MoFA, 2016).

In the specific case of tomato, Robinson and Kolavalli (2010a) observed that tomato farmers in the region appear to get better prices, as compared to their counterparts in other tomato producing regions in the country, which points to the poverty reduction potential of the sector. Though the potential of the tomato sector is yet to be exploited fully in the region, it contributed 35.7 percent to the national production in 2010 (MoFA, 2011; MoFA, 2012). Similarly, with regards to plantain, the region contributed 13.1

percent to the agricultural GDP in 2010 (Mensah-Bonsu et al., 2011; MoFA, 2011).

While the region has widely distributed suitable vegetational zones and soils that support the production of the various crops that it is noted for, there are some districts that make significant contributions to the production of particular crops. Techiman Municipality, Asutifi South and Tano North Districts particularly are endowed with human, natural and other requisite resources and thus produce a good mix of vegetables and food staples. This makes the issues of food produce marketing and the attendant low food production and poverty among the smallholder food crop farmers in these districts a major concern for Ghana.

The Techiman Municipality is one of the prominent tomato producing areas, not only in the Brong Ahafo Region but in the country as a whole. It is the major source of domestic supply in the rainy season between June and November and is roughly estimated to supply about 80 percent of the demand for fresh tomatoes in Ghana at its peak production (Amikuzuno & von Cramon-Taubadel, 2012; Britwum, 2013). The municipality has agriculture as the main economic activity with the key agricultural activity being crop farming which engages 95.4 percent of households in the municipality (Ghana Statistical Service [GSS], 2014a).

The proximity of the Techiman market, which is the largest food crop market in Ghana and arguably the largest in the West African sub-region, also adds cross-border trade nuances to the farmer-trader relationships. It is an international food market that hosts traders from neighbouring countries

(MoFA, 2011). Another important dimension of tomato marketing in the municipality is the siting and operation of the Tomato Processing Promotion Centre to use raw materials from the locality (Robinson & Kolavalli, 2010c). Furthermore, Techiman lies in the centre of the main north-south tomato trading route and this makes it an easier-to-reach producer market (Britwum, 2013). Therefore, it receives higher patronage of tomato itinerant traders, and tomato farmers and traders in the municipality are well placed to shed light on how food produce marketing relates to agricultural growth.

The Tano North District has agriculture as the predominant occupation and employing 67.1 percent of the total active work force (GSS, 2014b). The major food crops grown in the district include plantain and tomato which is grown in large quantities during the dry season (Tano North District Assembly [TNDA], 2016). Tano North District is also ranked fourth among the top 10 plantain producing districts in Ghana and the third highest producer in the region (MoFA, 2017).

Similarly, Asutifi South District is agrarian and has soils suitable for the cultivation of food crops including plantain and tomato (Asutifi South District Assembly [ASDA], 2013). The district used to be part of the Asutifi District and available records indicate that Asutifi District (now separated into Asutifi North and South Districts) ranked second among the top 10 plantain producing districts in Ghana (MoFA, 2016). It was also the highest in Brong Ahafo Region using three-year average (2013-2015) of plantain production figures (MoFA, 2017). The Asutifi South District therefore produces and

exports large quantities of food produce especially plantain to major marketing centers within and outside the region.

With the high participation in tomato and plantain farming and marketing activities, there is a lot to be learned from farmers and traders in the Techiman Municipality, Tano North District and Asutifi South District regarding the relationship between food produce marketing and agricultural growth. Moreover, the three districts are classified as urban, semi-urban and rural respectively and they differ in their levels of population, infrastructure such as the network and condition of roads, commercial and economic activities making the districts representative of the survey population. It is believed that these socio-economic differences are likely to produce remarkable insights in the analysis.

Statement of the Problem

Agricultural marketing has long been recognised as an important stage in the continuum of activities necessary for accelerated agricultural growth towards poverty reduction in most developing countries (Poulton et al., 2006). However, agricultural and food produce marketing in Ghana and many African countries appear to be under-developed and inefficient (Coulter & Onumah, 2002). Codjoe (2007) observes that food production in Ghana has performed poorly and attributes this partly to a lack of marketing incentives for smallholder food crop farmers.

The marginal or stagnant growth trend in the production of some food crops, particularly the more perishable ones such as plantain and tomato, in recent past is reported in the Brong Ahafo as well. Mensah-Bonsu et al.

(2011) maintain that the marketing problems that smallholder farmers encounter determine how far plantain production can be expanded. In the case of tomato, Anang, Zulkarnain and Yusif (2013) cite low price of the produce as one of the constraints that smallholder tomato farmers in the Wenchi District in the Brong Ahafo Region face which limit their ability to increase production. Attoh, Martey, Kwadzo, Etwire and Wiredu (2014) also report of unstable prices as a major constraint of tomato production in the country.

A number of studies on food produce markets suggest the factors that contribute to their seemingly inefficiency and poor integration. Diao, Dorosh and Rahman (2003) classify some as demand-side constraints such as stagnant or limited demand for additional produce from domestic and regional consumers. Conversely, production or supply-side constraints identified include fluctuating harvests from numerous dispersed smallholder farmers who rely on rain-fed production technology; poor marketing infrastructure and high transaction costs (Onumah, Davis, Kleih & Proctor, 2007; Easterling, Fox & Sands, 2008; Onyuma, Icart & Owuor, 2006).

High transaction costs may be experienced by both farmers and traders in the food produce marketing system. The high transaction costs may be as a result of the cost of assembling the produce from numerous and scattered smallholder food crop farmers with poor rural transport infrastructure (Porter et al., 2007). Consequently, seasonal gluts for highly perishable produce especially vegetables combined with limited storage facilities (Ngeleza and Robinson, 2011; Robinson & Kolavalli, 2010b) are a common occurrence in the Brong Ahafo region.

Other causes of high transaction costs that may be identified include information asymmetry (Coulter & Onumah, 2002) and lack of standardisation practices such as grading and sorting (Sefa-Dedeh, 2009). Nuhu, Ani and Bawa (2009) argue that information asymmetry provides a potential opportunity for traders to realise excessive profits through all kinds of exploitative practices and thereby increasing risks associated with inter-market trade. Relationship marketing theory explains that such behaviour of participants of marketing systems constitute non-price means of coordination of marketing activities (Daudigeos & Valiorgue, 2010; Foundjem-Tita et al., 2012).

Moreover, Sahara et al. (2013) suggest that poor relationship quality may result in the situation where farmers and traders do not share information and coordinate supply and demand to reduce transaction costs. This implies that one of the assumptions necessary for perfect competition in neoliberal theory which is perfect information may not be satisfied and the market may be regarded as inefficient. Other market risks may arise from differences in bargaining power. The theory on risks brings out the understanding on the risky nature of food produce marketing and the management strategies both farmers and traders employ (Adimabuno, 2010; Franken & Pennings, 2005).

Over the years, various efforts that have been made by governments to address the marketing situation appear to be inadequate. Ghana's trade policies since SAP have had export-led development approach in line with the neoliberal theory as against the import substitution approach it had used earlier (Sharma, 2011). The trade policies show an over-emphasis of

promoting export-led agricultural growth to the near neglect of domestic marketing of food produce (MoTI, 2012). Though governments have made attempts to use trade policy instruments to curb the effects of the resultant susceptibility to import surges for some food items like tomato (FAO, 2011), these are of limited and transient impact.

The consequence of the prevailing situation of the food produce marketing system seems to be dire on agricultural growth. Onumah (2010) argues that farmer margins are low and this adversely affects smallholder farmers' decision to adopt innovative farm technology that can raise agricultural productivity and reduce poverty. Even though in recent years agricultural growth (5.7% in 2013) and food production in Ghana (6% per annum in the period 2006 to 2012) have been increasing (WTO, 2014), MoFA (2017) suggests that the agricultural sector in general and the food crop subsector in particular have not yet met their potential. The contribution the food produce marketing system makes to this situation can be understood when the level of efficiency of the marketing system is known (Mensah-Bonsu et al., 2011).

In spite of the developments in agricultural marketing thinking, there has been an over-emphasis of the economics of the functioning of markets with the neglect of the fact that markets are social structures (Evers & Gerke, 2007). Consequently, the socio-cultural conditions under which farmers interact in the market system is often ignored with little research focusing on individual smallholder farmers and the relationship issues they face as market participants (Adimabuno, 2010).

Available studies conducted on interrelationships among farmers, traders and other members of the value chain have concluded that improving relationship quality has the potential to enhance market efficiency (Fischer & Reynolds, 2010; Giha & Leat, 2010; Gracia, Magistris & Albisu, 2010; Lyon, 2000). In spite of this, only a few studies have focused on buyer-seller relationships in smallholder agriculture in Ghana and other developing countries (Bijman, 2008; Gyau & Spiller, 2008; Sahara et al., 2013). This tends to offer only a partial appreciation of the efficiency of the market and may not provide adequate information needed to examine how the market contributes to the growth of the sector.

The issues discussed above indicate that there is the need to incorporate the effects of relationship quality on market efficiency in studying how the efficiency of the marketing system informs farmers' production decision making. This helps to address the neglect of seller-buyer relationships in studying the efficiency of the marketing system. Thus this research sought to fill this gap by including an assessment of the relationship quality between smallholder food crop farmers and traders in determining the efficiency of the food produce marketing system. From this perspective, the research studied how the efficiency of the food produce marketing provides an incentive for farmers' decision to produce more and contribute to agricultural growth.

Purpose of the Study

The purpose of the study was to ascertain the contribution of food produce marketing to agricultural growth in three selected districts in Brong Ahafo Region of Ghana.

Research Objectives

The specific objectives were to:

1. Examine the issues that affect food produce marketing in the Brong Ahafo Region;
2. Assess the extent of spatial integration of food produce markets in the Brong Ahafo Region;
3. Explore the factors that define the relationship quality between farmers and traders in the food produce marketing system in the Brong Ahafo Region; and
4. Examine the production decisions that food crop farmers make in response to incentives from the food produce marketing system in the Brong Ahafo Region

Research Questions

The following research questions have been framed based on research objectives 1, 3 and 4 in that order:

1. What were the issues that affected food produce marketing in the Brong Ahafo Region?
2. What factors defined the relationship quality between farmers and traders in the food produce marketing system in the Brong Ahafo Region?

3. What production decisions did food crop farmers make in response to incentives from the food produce marketing system in the Brong Ahafo Region?

Hypothesis

Based on research objective 2 for the study, the following hypotheses were formulated:

H₀: Food produce markets in the three districts were not spatially integrated

H₁: Food produce markets in the three districts were spatially integrated

Significance of the Study

Food produce marketing has a likely effect on the decisions farmers make to produce and thus has the potential to contribute to agricultural growth and development. This makes the effect of food produce marketing on production and agricultural growth an important developmental issue that affects the welfare of numerous smallholder farmers who dominate the sector and that of urban consumers (Jaleta & Gebremedhin, 2012).

Studies conducted in this area have concentrated on either the efficiency of the marketing system or the production of food produce while a few study the two sides together. The study identifies this gap and therefore makes a contribution to the conceptual literature by examining how food produce marketing influences agricultural growth. The comparison of plantain and tomato which brings out the effect of the perishability of a produce on risk management strategies of food produce market channel members is an added value.

The different contribution the study makes to the theoretical literature on agricultural commodity marketing is in integrating economic and social or behavioural theories to explain the contribution food produce marketing makes to agricultural growth in the Brong Ahafo Region.

It contributes to the wealth of knowledge existing on the link between food marketing system and agricultural growth. In particular, the literature on how smallholder farmers' access to commodity markets influence production will be enriched. Studying and documenting the contribution food produce marketing makes to agricultural growth seek to correct the over-emphasis of production at the expense of marketing in national agricultural policies.

Additionally, the findings from the study and its related recommendations provide important input into policy considerations for programmes to be planned to improve food produce marketing system in Ghana. The findings provide a better understanding of the socio-economic and institution-related issues that affect food produce marketing based on which MoFA can design targeted approaches to address the shortcomings for the benefit of farmers and traders. The insights the study brings into the efficiency of plantain and tomato markets both through price and relationship quality analyses equip farmers and traders to adopt appropriate marketing practices to increase profits.

The study makes available information on the factors that influence farmers' decision to produce for marketing which is useful in initiating policy measures to improve the food crop subsector in particular and the agricultural sector in general. It contributes to identifying the particular problems of food

produce marketing in the Brong Ahafo Region in order to facilitate the formulation of regional policies and make the region fulfill its part of the national goal of agricultural growth.

Delimitations

The study covered only tomato and plantain marketing to present an insight into the food produce marketing in the Brong Ahafo region. It examined the efficiency of the food produce marketing system and related it to the production decisions of smallholder food crop farmers to establish the contribution it makes to agricultural growth. Market efficiency was analysed by applying both price and non-price measures where relationship quality between farmers and traders was used as the non-price measure. The study also covered the factors that influenced the risk behaviour of smallholder food crop farmers.

To make it more representative of the study area, three districts that produce both types of food commodities at appreciable levels were selected. In each district, three settlements and one district market were covered to give it a wide coverage. The conclusions drawn from the study would therefore be applicable to tomato and plantain farmers in the Brong Ahafo region and beyond where farmers face similar circumstances.

Limitations

The study encountered some limitations in some aspects of the study design. These included the restricted geographical coverage of three districts, namely, Techiman Municipality, Tano North and Asutifi South Districts for

the study. The then Brong Ahafo Region, until it was split into three regions in 2019, was large and comprised 27 districts. Even though many of these districts had tomato and plantain producing areas, the three districts were selected as the study area. This indicates a constraint in terms of size and composition of sample size and may reduce the representativeness and generalisability of the contribution of food produce marketing to agricultural growth in the region.

Another limitation observed related to the fact that there were no exact figures concerning the number of tomato and plantain farmers and traders in the region and therefore there was no sample frame. As a result the sample size for the study might not be representative and a more robust sampling method could not be used for very reliable representation of the population. Furthermore, the use of the convenience sampling method which is a non-probability method, even though part of the study is quantitative, may reduce the representativeness and generalisability of the results.

With regards to relationship quality analysis, part of the data is based on single sided interviews with the tomato and plantain farmers while the opinions of the traders were completely ignored. Additionally, the role of information as key factor in the determination of market efficiency was insufficiently discussed as a result of inadequate data. However, in spite of the limitations the samples are considered substantially representative of the farmers and the traders in the region. The sampling techniques used also helped in arriving at reasonable and reliable conclusions on studying the contribution food produce marketing makes to agricultural growth.

Definition of Terms

Smallholder farmer: Smallholder farmers are defined in various ways depending on the context, country and even ecological zone. Often the term ‘smallholder’ is interchangeably used with ‘small-scale’, ‘resource poor’ and sometimes ‘peasant farmer’. The Ministry of Food and Agriculture (MoFA, 2006) observes that agriculture is predominantly on a smallholder basis in Ghana where about 90% percent of farm holdings are less than two hectares in size. According to the FAO (2012), smallholder farmers are farmers who manage areas varying from less than one hectare to 10 hectares. Chamberlin (2007) found that smallholders in Ghana produce fewer crops, market less and are less likely to use purchased inputs and they are often engaged with the market with the sale of food crops than other items. Smallholders are indeed prevalent within Ghana’s rural economy. More than three-quarters of producer households are farming less than 3 hectares, which is close to the national average.

Rural: Rural in this study means any settlement with a population less than 5,000 (GSS, 2014a).

Urban: In this study, urban means any settlement with a population more than 5,000 (GSS, 2014a).

Organisation of the Study

The study has been organised in nine chapters. Chapter One is an introduction and a foundation for the study. It consists of the background to the problem, the rationale, the problem statement, the objectives and research questions. It also gives the significance of the study. The review of literature

including the theoretical framework and relevant concepts is presented in Chapter Two. Chapter Three discusses a number of related empirical studies and the development of a conceptual framework.

Chapter Four is devoted to the methodology of the study. It starts with the research design, continues with the study area and describes the agricultural attributes of the administrative districts selected for in-depth investigation at farm household and trading enterprise levels. The population and sampling procedures, instrumentation, pre-testing and field work are presented. In addition, data analysis and ethical issues and considerations conclude the chapter.

Chapter Five provides an analysis of the policy environment informed by development theories that affect food produce marketing in Ghana. In this chapter, the nature of food produce marketing in Ghana is analysed from policy and practice perspectives. Chapters Six, Seven and Eight present the analyses of the empirical evidence of the relationship between food produce marketing and agricultural growth. Chapter Six discusses the qualitative aspect of the analysis while the Chapter Seven and Chapter Eight present the quantitative analyses. The thesis culminates in the summary of the research, conclusions and recommendations for improvement in food produce marketing in Chapter Nine.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

The purpose of this literature review is to locate this study within the context of the existing literature. It seeks to provide a clear theoretical framework for the key arguments of the study. In addition, this review will analyse the divergent opinions of various authors on the theoretical underpinnings of the main argument of this study that food produce marketing can positively affect agricultural growth in suitable socio-economic contexts. The review is to identify gaps and provide a basis for how the research can contribute to existing body of knowledge.

The importance of literature review in research cannot be overemphasised since it makes critical contributions to almost every step of the research process. It satisfies the need for theoretical and methodological background for the research to ensure that it is original without duplicating previous research efforts because, as Jankowitz (1995 cited in Jesson & Lacey, 2006, p. 140) puts it, 'knowledge doesn't exist in a vacuum and your work only has value in relation to other people'. The theoretical background is required to establish the theoretical roots of the research, clarify ideas, develop methodology and compare findings with existing knowledge (Kumar, 2011).

The chapter reviews literature on the theoretical and conceptual issues regarding food produce marketing and agricultural growth. The review sets out to cover the section of literature on neoliberal economic development theory that currently seems to predominantly underpin the economic

development processes of developing countries. In this context, derivatives of the neoliberal theory that specifically relate to food produce marketing and production decisions that affect agricultural growth are reviewed as the other main theories of the study. These are the theories of agricultural marketing, relationship marketing and household decision making. The review continues with the key concepts emerging from these theories such as marketing system, market efficiency, market integration, relationship quality and food produce marketing.

The review highlights the need to consider behavioural sciences as a necessary complement to economics in the theoretical framework for studies in agricultural marketing. In addition to relationship marketing theory, literature on risk theory that cuts across the two themes of food produce marketing and agricultural growth is also reviewed. The chapter continues with the literature review of key concepts from the theories including risk behaviour and agricultural growth. Thus the review adopted the thematic approach while the concepts relating to the various theories were reviewed separately under each theme.

Food Produce Marketing and Prevailing Development Theories

Agricultural and food produce marketing in both developed and developing countries has received various levels of attention from governments at different points in time. The application of development theories for policy formulation from modernisation through dependency to neoliberal eras has the potential of promoting or limiting the marketing of food produce at domestic and international levels. It is useful therefore to discuss

how the neoliberal development theory impacts on the specific case of food produce marketing since it has implications for both domestic and international markets.

Food Produce Marketing and Neoliberal Theory

To the extent that neoliberal development theory has had a huge influence on development policies of developing countries and international institutions since the 1980s, the theory becomes important to the study of food produce marketing. In particular, as argued by Schydrowsky (1995), structural adjustment programmes which emerged from neoliberal theory has become the orthodox economic policy in developing countries and has affected the choice of agricultural strategies of developing countries. The theory has transformed the relationships between the state and the market in rural economies (Pritchard, 2005; Thorsen, 2009).

Clarke (2005) traces the foundations of modern economics and of the neoliberal theory back to Smith (1776) where the principles of activities in a market were originally suggested. Neoliberal theory emerged as early as the 1940s mainly in reaction to the shortcomings of modern liberal economic theories of Keynes (1936) that had been the dominant development theories between 1945 and 1970 (Vorster, 2010). By the end of the 1980's neoliberalism had successfully become the dominant paradigm underpinning economic policies of states and international agencies. Some writers attribute this largely to the work of Friedman (1962) and others like Mises (1962) and Hayek (1973) who argued for the reinterpretation of classical liberal tenets (Vorster, 2010).

Neoliberalism has been defined variously by different writers. For instance, Hayek (1944) defines neoliberalism in terms of a political ideology while others like Clarke (2005) and Palley (2005) define neoliberalism in terms of an economic theory. However, Harvey (2005) provides a definition which is wide-ranging and situates neoliberalism in both economic and political thinking as “a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterised by strong private property rights, free markets and free trade” (p. 2).

Subsequently, Thorsen (2009) assert that neoliberalism is a return of economic liberalism which happens to be only one aspect of the liberal tradition. Consistent with this assertion, Barnett (2010) adds that neoliberalism is an economic theory distinct of classical liberal values. Neoliberal theory posits that underdevelopment is caused by poor resource allocation as a result of incorrect pricing policies and too much state intervention. Thus, ‘getting the prices right’ has been the key tenet of neoliberal theory (Onis & Senses, 2005) by which it is believed economic development will be achieved as the power of market forces is allowed to operate and the state is curtailed (Hamm, King & Stuckler, 2012).

The neoliberal theory maintains that efficient allocation of resources is the most important purpose of an economic system, and the most efficient way to allocate resources is through market mechanisms (Barnett, 2010; Harcourt, 2009). Similarly, Foxley (2010) notes that the prime role of the market is to

generate competition and thereby engender “a more efficient economy that better allocates scarce resources, reduces costs, and constantly evolves and in so doing enables the private sector to find new opportunities for production and exports” (p. 13). Thus, competition is recognised as the vehicle through which the market attains efficiency.

Meanwhile, Vercelli (2003) argues that for a market to ensure the optimal allocation of resources among alternative uses, the assumptions of a perfectly competitive market must be fulfilled. Vercelli outlines these assumptions as completeness of markets, zero transaction costs, absence of serious uncertainty or perfect information, sufficient thickness and extension of markets or numerous traders are fulfilled. However, these assumptions are so stringent that all of them are often not complied with, especially in developing countries, which suggests that markets in developing countries are scarcely efficient (Birdsall, de la Torre & Caicedo, 2010; Rodrik, 2007).

Neoliberals prescribe a systematic programme of reducing state involvement in the economy since it is assumed that decreasing the realm of the state in the economy essentially means widening the realm of the market (Onis & Senses, 2005). The programme for market take-over of the economy through macroeconomic stabilisation, privatisation and liberalisation of prices is considered the panacea for the economic woes of developing countries (Barnett, 2010; Hamm et al., 2012). This programme is codified as ‘structural adjustment programmes’ or SAPs.

The SAPs aim to address the failure of the state as perceived by neoliberals in developing countries, especially in Latin America and Sub

Saharan Africa (Rapley, 2007; Rodrik, 2006). In the view of Detlef (2012), the rationale that neoliberals have for SAPs are that government spending induces high inflation, state-owned enterprises are less efficient than private enterprises, state protection distorts free flow of goods and services and government demonstrates that it is incapable of allocating resources efficiently.

The leading writers of the neoliberal counterrevolution such as Lal (1983), Krueger (1983) and Bhagwati (1985) argue that the state should be rolled back since it is state intervention in economic activity that slows the pace of economic growth. The theory underscores the fact that imperfect markets are better than imperfect states. It therefore suggests that the public sector should be exposed to competition and the conditions of demand and supply for it to be more free-market oriented (Vorster, 2010). Therefore, neoliberals consider government's intervention in agricultural marketing as a distortion of prices in general and comparative advantage in exporting primary products, in particular (Barnett, 2010).

According to Rapley (2007), neoliberal theory postulates that when barriers to trade and price distortions in domestic factor, product and financial markets are removed and free markets prevail, comparative advantage will combine with the Heckscher-Ohlin theorem to enhance capital accumulation. Similarly, Rodrik (2007) and Thorsen (2009) point out that linking capital accumulation with exposure to international markets this way highlights specialisation as an essential ingredient of development since the rationale of comparative advantage is that of specialisation.

In neoliberal economics, competitive markets coordinate diverse activities of profit-maximising firms and individuals seeking their own interests (North, 1991; Thorsen, 2009). Barnett (2010) argues that even though it is expected that markets will ensure not only efficiency but also equity, attainment of equity in the marketing process in the real world hardly happens, particularly for farmers as opposed to middlemen and consumers.

However, Lal (1983) and Bhagwati (1985) insist that when markets are competitive, they are impersonal and demonstrate neutrality. It is the price mechanism that performs the task of determining the terms on which market participants shall have access to goods and services. Subsequently, Vorster (2010) mentions that prices perform three functions in an economic activity and these are transmitting information, providing incentives for the adoption of least-cost production methods, and determining who gets how much of products. In addition to performing these functions, the market also prevents one person from interfering with another and equity is ensured.

Unlike the classical liberal theory that has a multidimensional view of the sources of economic development which include institutions and culture, neoliberal theory essentially holds a monocausal view of development that economic retardation is due to resource constraints (Adelman, 1999). Adelman further notes that neoliberal theory assumes that there are few institutional impediments to the requisite resource-reallocation that would lead to development. This reiterates an earlier criticism by North (1991) that neoliberal theory implicitly presumes that institutions, whether economic or political, do not matter but maintains that what is important is economic

efficiency through "getting the prices right". In rejecting neoliberal theory's monocausal view, Neill (2008) also refers to the theory as being naive in that it presupposes fixed institutions.

The importance of institutions in economic development has been emphasised by a number of writers. For instance, North (1991) insists that the state as an institution cannot be treated as an exogenous factor in development because the desired results from getting the prices right can only happen when the right institutions are in place. Subsequently, Adelman and Morris (1997) noted that countries that industrialised first had the most developed market institutions, among other systems. Thus, the eventual evolution of complete domestic markets provided for the wide distribution of marketable surplus that ensured sustained long term economic development for these countries.

Kotz (2003) and Neill (2008) also indicate that development requires a more complex understanding of social systems which include institutions and their changing interactions over time. Furthermore, Hamm et al. (2012) argue that creating and maintaining institutions, including reliable information dissemination, provide the fertile conditions for economic growth and mention in particular, that privatisation reduces economic growth if the necessary institutional reforms are not put in place.

Todaro (2002) observe that with the domination of the neoliberal free market counter revolution in economic theory in the 1980s, more attention has shifted to "getting prices right" and "trade is enough". Maymin and Lim (2012) agree with this and add that it has meant that governments promote free markets and allow the "invisible hand" of market prices to guide resource

allocation in order to stimulate economic development. In effect, the neoliberal free market theorists such as Krueger (1983), and Bhagwati (1985) highlight the importance of markets in the development process but fail to appreciate that, in many ways, markets in developing countries are not perfect even when they exist.

Besides the free market paradigm, two other schools of thought identifiable of the neoliberal theory are the public choice or ‘new political economy’ approach and the market-friendly approach. The public choice approach emerged in the period 1980 to 1996 and challenged the structuralist development idea of a benevolent state that acts in the public interest always (Barnett, 2010; Thorsen, 2009). The approach posits that there is inherent government failure and self-interested behaviour of public officials in less developed countries which keep them underdeveloped (Todaro & Smith, 2012).

Subsequently, a later approach of the neoliberal theory has emerged since 1997 referred to as the market-friendly approach. It posits that governments do have a key role in facilitating the operations of markets through “non-selective” or market-friendly interventions such as the development of infrastructure for transport, storage and information and providing a conducive climate for private enterprise to function (Onis & Senses, 2005). Onis and Senses further indicate that it is also expected that the state takes up the important role of developing and transferring technology such as agricultural extension services for farmers. All this points to the

acknowledgement that there are possible imperfections in developing country markets (Foxley, 2010; Moreira & Crespo, 2012).

Factors Affecting Food Produce Marketing in the Context of Neoliberal Theory

It has been generally established that the neoliberal market-oriented reforms of the 1980s and 1990s have not produced the intended results. It is acknowledged by even its most devoted proponents that growth has been below expectations, especially in Latin America and Sub-Saharan Africa (Griffith, 2006; Kelly, 2008). Nonetheless, the theory appears to persist in its influence on the policy environment in most developing countries (Rodrik, 2006) and underpins the functioning of the food produce marketing system. Factors such as the nature of production systems, market information, market infrastructure and social capital such as farmer organisation that seem to affect agricultural and food marketing systems are discussed in this context.

The main shortcoming of the free market neoliberal theory is being 'fundamentalist' and prescribing what has been described as a 'one size fits all' treatment of individual economies (Birdsall et al., 2010; Hausmann, Rodrik & Velasco, 2008; Hoff & Stiglitz, 1999). For instance, Birdsall et al. criticise the theory for ignoring differences that exist among country contexts and expecting that the market reforms will almost automatically produce good economic outcomes in all circumstances.

One such difference in country contexts is the structural rigidity in developing countries' rural production systems, which has been identified as the key among the factors that impede the growth of incomes from primary

product exports and domestic food produce markets. As Smith (2005) and Talkington (2011) observe, the conditions under which developing countries function are distinct from those of developed countries. In this wise, Todaro and Smith (2012) identify some of the structural rigidities as limited resources, obsolete rural socio-economic and institutional structures, unproductive land tenure system, infertile soils as well as unfavourable climate and uncertainty of the weather. These limit the capacity of farmers to respond adequately to the demand for their produce and thus the market reforms under SAP do not necessarily improve farmers' incomes and welfare.

As has long been recognised by classical economists such as Smith (1776), the market cannot deliver certain public goods like infrastructure. Thus, the onus falls on the state that stands for the public interest to make the necessary infrastructure available. However, Onis and Senses (2005) have observed that the neoliberal era involved a general state failure where, rather paradoxically, the liberalisation process that was supposed to check corruption produced a favourable environment for it. With weak state institutions, the provision of public goods has lagged behind and it is the poor farmer that bears the brunt of the neglect in the provision of market infrastructure and loses out on the potential benefits from an expanded market access (Onis & Senses; Hamm et al., 2012).

Limited market information is another factor that affects food produce marketing as a result of the application of the neoliberal theory. Todaro (2002) and Ackerman and Nadal (2004) argue that markets in developing countries are uncompetitive for reasons such as limited information. Griffith (2006)

explains that these conditions may persist under neoliberal reforms as the state loses its policy autonomy and does little to put in place the required structures that benefit the poor. Rodrik (2007) points out that the role of the state becomes even more critical when there is information asymmetry. Porter et al. (2007) agree with this point and further note that often trader information is the farmer's only source of information about pricing and this engenders a situation that does not make room for the checks and balances that are necessary for competition.

The retreat of the state under neoliberal reforms, paving the way for unbridled market forces to operate leads to economic and social costs, especially for poor smallholder food crop farmers (Pattnaik, 2008). Nuhu et al. (2009) observe that farmers are, by far, the market participants who are worse off in situations of imperfect competition arising from information asymmetry because they operate at the end of the communication network and often receive information late or filtered. Therefore, as Barnett (2010) asserts, limited and unequal distribution of information tends to make market participants who lack information susceptible to cheating by those who have.

The fact that markets are affected by social factors such as social capital is emphasised in the literature. Swedberg (1986) argues that the structure of the market is considered to be a social system comprising of an intermediate network that links firms in a system of governance. Moreover, Evers and Gerke (2007) and Birdsall and Fukuyama (2011) point out that the functioning of markets is entirely described in sociological terms. This means that markets are not just abstract concepts of supply and demand, but rather

are social structures put together by numerous perceptions and decisions of market participants that interlink.

Nonetheless, neoliberal theory does not regard the fact that development theory and policy require a much more complex understanding and consideration of social systems and dwells only on capital accumulation (Adelman, 1999). Additionally, the neoliberal assumption of the existence of a purely 'free' market is challenged on the grounds that all markets are embedded in a broader social context (Rodríguez-Pose & Storper, 2006; Smith, 2005). Even though neoliberal theorists also argue that markets and other economic relationships are 'socially constructed', writers such as Peck (2005) point out that this contradicts the neoliberal mainstream economics theoretical perspective that basically sees markets as having participants who are rational, self-interested and utility-maximising individuals.

In the case of food produce marketing during SAPs, private traders attempt to develop institutions that will enable them to succeed in expanding their marketing activities by forming associations (Coulter & Onumah 2002). Barnett (2010) contends that this is in response to the roll-back of the state which creates a void and leads to the formation of various social groupings around such axes as religion, morality, nationalism and associationism. In particular, strong trader associations are formed in the food produce marketing sector (Britwum, 2013).

In contrast, food crop farmers who are also market participants with similar experience regarding the effect of the roll-back of the state are not able to form as strong associations as the trader associations. Poole and de Frece

(2010) explain that farmer associations are weak because smallholder food crop farmers' production decisions and investments are individually undertaken, in line with the household decision-making theory which is a variant of neoliberal theory. As a result, smallholder food crop farmers may only come together informally when there is the need. Conversely, the strength of the trader associations makes the traders more powerful than the farmers who are vulnerable due to their insufficient knowledge of market strategies (Courtois & Subervie, 2013; Robinson & Kolavalli, 2010a).

Another factor that affects food produce marketing is ethical consideration, especially regarding how market participants treat one another. Vorster (2010) contends that all dimensions of life, including economics, need to be subjected to ethical and human criteria for the sake of human beings. The argument is that since the economy is not value-free and it is not only governed by economic laws, the actions of people who determine it must be guided by ethical issues (Birdsall et al., 2010). Nevertheless, Adimabuno (2010) observes that with the over-emphasis of the economics of the functioning of markets influenced by neoliberal theory, the socio-cultural conditions under which farmers interact in the market system is often ignored and little research focus on individual smallholder farmers and the relationship issues they face as market participants.

Theoretical Underpinnings of Food Produce Marketing

Food produce marketing, which falls under the broad category of agricultural produce or commodity marketing, has a long history. Agricultural marketing construct has evolved from the same root as general marketing

since the beginning of the twentieth century (Ahmad, 1995; Meulenber, 1986). According to Meulenber (1986), before this time that the term ‘marketing’ idea or thought which was first coined by Powell (1910) came into being the simple activity was called ‘trade’, ‘distribution’ or ‘exchange’.

Linn (2010) discusses the historical account of ‘marketing’ and traces it further to early capitalism and the main principles originally suggested by Smith (1776) in “Wealth of Nations”. Ali and Talwar (2013), on the other hand, assert that in addition to capitalism, the history of marketing also begins with ‘sociological theories of the growth of consumerist culture’ (p. 26). It appears the marketing thought, where agricultural marketing and for that matter food produce marketing originated, basically takes its roots in economics but with some sociological undertones.

According to Ahmad (1995) and Ludicke (2006), marketing does not have one fundamental theory even after a long search for a theory of marketing since 1946. However, Hani (2012) notes that in the attempt to form a general theory of marketing, marketing draws from different academic disciplines including economics, psychology and management. Therefore, research in marketing makes use of a combination of theories of marketing as a means of conceptualising a potential theory of marketing, making it increasingly multidisciplinary in nature.

Theory of Agricultural Marketing

Agricultural marketing and general marketing have been similar in the early years of marketing as a discipline having originated from the same root in the 1900s (Kohls & Uhl, 1985; Kotler, 1980; Meulenber, 1986). A clear

demonstration of the similarity between the two constructs is seen in the early definitions. For instance, the definition of agricultural marketing in the 1970s which compares well with that of marketing states that 'marketing is the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they are in the hands of the ultimate consumer' (Kohls & Uhl, 2002). Thus, agricultural marketing and particularly food produce marketing has traditionally been concerned with the business activities that make food produce available to the consumer.

Since the 1950s, agricultural marketing and general marketing seem to be different branches of marketing. Ludicke (2006) and Vargo and Lusch (2004) note that agricultural marketing separated from general marketing when general marketing evolved into marketing management with an emphasis on decision-making and serving customers. With the adoption of marketing management as the basic approach to marketing of goods and services came the development of concepts such as the marketing orientation, segmentation and the '4Ps' marketing mix of product, place, price and promotion in general marketing (Crawford, 2006).

As agricultural marketing remained unchanged when general marketing adopted the marketing management approach, a gap has been created between the two (Meulenberg, 1986). This gap has earlier been pointed out by marketing writers, including Kohls and Uhl (1985) and Polopolus (1982), who also contend that it is not helpful for agricultural

marketing since the changing marketing environment calls for the application of marketing management in agricultural marketing as well.

Subsequently, it has been observed that part of agricultural marketing theory has shifted towards marketing management approach to some extent. Richardson (1986) describes this part as agribusiness approach to marketing and indicates that the concept seems to be a comprehensive approach that considers production and all the marketing activities that happen until the product reaches the final consumer as interrelated and integrated. In the same vein, Kirsten and Sartorius (2002) and Ludicke (2006) affirm that the dominant thinking that agricultural marketing has to do with presenting what is produced has shifted to a situation where farmers seek to know what consumers want, resulting in agriculture becoming increasingly integrated.

Exchange of commodities is often seen as the initial focus of marketing theory. Vargo and Lusch (2004) point out that marketing inherited a model of exchange from economics where physical products are commonly exchanged representing a model by which tangible resources, embedded value and transactions take centre stage. Linn (2010) asserts that the transaction of buying and selling is the key objective of all commercial activities. Transaction occurs at a point when a buyer acting in self-interest, recognises that the value of an offer is higher than the price being asked for. Therefore, the transaction of buying and selling are the activities usually associated with exchange even though many other functions also support the exchange process (Brunswick, 2014).

Moreover, Ludicke (2006) contends that marketing does not always involve exchanges and supports an earlier proposition by Kotler and Levy (1969) that marketing should be conceptualised “not as exchange but as a universal process” (Ludicke, 2006, p. 11). Sheth and Uslay (2007) note that the historical focus of marketing, which is based on the exchange paradigm has given way to a logic that emphasises on creating and delivering value by means of customer relationships. The definitions of marketing by the American Marketing Association since 1985 where ‘exchange’ has been absent amply demonstrate the change. Similarly, Ali and Talwar (2013) argue that earlier definitions of marketing included reference to the term ‘exchange’ but the relevance of this has recently been challenged.

Another key feature of the agricultural marketing theory has always been price. Price is important in the transaction of selling and buying and is determined by the supply and demand for the commodity (Shepherd, 2005). It means that the seller independently sets the price and the buyer decides the value and judges the price against the perceived value and transaction happens when both the seller and the buyer realise that they benefit from it (Crawford, 2006). Thus, Linn (2010) argues that price and value are essentially two sides of the same phenomenon viewed from opposite ends and that the relationship between them triggers transaction.

Price has been described as information for the communicative processes of economic systems (Ludicke, 2006). Oladapo and Momoh (2008) emphasise the important role of prices and indicate that prices are by far the most reliable and available information that guide farmers’ planting decisions.

Farmers make their planting decisions in anticipation of good prices that will yield reasonable profits. Subsequently, Lohano and Mari (2012) write that prices are the signals that direct and coordinate the production and consumption decisions as well as the marketing decisions over time, form, and space. This makes the coordinating and informational roles that prices play crucial to market performance.

Price information enables profit seeking entities to take advantage of signals of price differentials among markets to move goods to the market of higher prices (Billinsley, 2005). Billinsley explains that this practice termed arbitrage tends to push the prices of homogenous commodities towards equality and reinforces the 'law of one price' for improved efficiency of the market. The law of one price postulates that in an efficient market there must be only one price for homogenous commodities, barring transportation and other transaction costs (Atingi-Ego, Opolot & Drale, 2006; Linn, 2010).

According to Barrett (2005), arbitrage opportunities seem to be missed in many situations where commodity price variability across space and time is observed in developing countries due to poor communications and transport infrastructure. Failure to use price in decision-making to take advantage of arbitrage opportunities thus causes price disparities to remain and the law of one price is violated (Oladapo & Momoh, 2008). However, Jensen (2009) asserts that information on price is hardly perfect and this makes it impossible for optimal arbitrage to occur since optimal arbitrage can happen only when entities involved in the market have full information.

Aker and Fafchamps (2010) observe that the increasing use of information technology is helping to reduce search costs and consequently decreasing price dispersion among markets in Sub-Saharan Africa and Asia. Initiatives of this nature contribute towards creating the law of one price through better co-ordinated and integrated markets (Jaleta & Gebremedhin, 2012). Allen (2014) indicates that this trend is particularly beneficial to developing countries like Ghana where farmers, especially, have been finding it costly to have information about market conditions in other places.

Agricultural marketing theory concentrates not only on price decision-making but on price formation as well. According to Rapsomanikis, Hallam and Conforti (2003), spatial price determination models postulate that changes in supply and demand conditions in one market will affect trade and therefore prices in other markets until equilibrium is restored through spatial arbitrage. In addition, Atingi-Ego et al. (2006) and Mose (2007) indicate that where two markets are linked by trade and are operating in a fair system, the impact on price will be equal in both markets if a change in demand or supply occurs in one market. This situation is also a prediction for market integration.

Agricultural marketing theory incorporates market integration as a condition estimating the efficiency of marketing systems. Wyeth (1992) argues that market integration is multidimensional and indicates that the dimensions comprise of similarity in price variation or price integration, standardisation of measures and common trade habits. Therefore, price integration is one of the necessary conditions for market integration. However,

market integration is commonly referred to in terms of the co-movement of prices or price integration (Barrett, 2005; Oladapo & Momoh, 2008).

Market integration is reported to have four distinct forms which are integration across space, time, product forms and within the marketing chain (Tomek & Robinson, 1990). Sarpong and Asante (2002) explain that spatially integrated markets are markets in different locations where the difference in price is the transfer costs between them, given that there is trade between the markets. In the case of markets integrated in time, the price difference between them does not exceed the physical and financial costs of storage. Markets are integrated across product form when the price difference between two related products does not exceed processing costs (Mose, 2007). Integration within the marketing chain or vertical integration happens when the producer, wholesale and retail markets for the same commodity in an area are interrelated and integrated (Kanakaraj, 2005). This study deals with spatial market integration of food produce.

Ghafoor, Mustafa, Mushtaq and Abedulla (2009) define spatial market integration as the co-movement or the long-run relationship among prices in spatially separated markets. In support of this definition, Ankama-Yeboah (2012) adds that spatial market integration measures the extent to which markets at geographically distant locations share common long-run price or trade information on a similar commodity. According to Acquah, Micah and Owusu (2012), in spatially integrated markets prices are determined at the same time in the various locations, and information of any change in price in one market is transmitted to the other markets. Spatial market integration is

important in food produce marketing since food produce is often bulky and/or perishable and consumers are located a distance away from producing areas and marketing may involve high transport costs (Acquah & Owusu, 2012).

The consequence of arbitrage activities in a competitive market is price integration. Serra, Goodwin, Gil and Mancuso (2006) note that improving information between spatially separate markets contributes significantly to spatial price integration and suggest that explicit trade between spatially separate markets is not a necessary condition for price adjustments to occur and result in price integration. Agreeing that information improves the competitiveness of markets, Mose (2007) and Lohano and Mari (2012) also conclude that analysing spatial price integration gives an indication of the competitiveness and the effectiveness of arbitrage in markets.

Integration of markets can occur to various degrees ranging from perfect market integration to complete market segmentation. Rapsomanikis et al., (2003) define perfect market integration or complete price transmission between two spatially separated markets “as a situation where changes in one price are completely and instantaneously transmitted to the other price, as postulated by the Law of One Price” (p. 55). This definition distinguishes between short run and long run price transmission by suggesting that price transmission is incomplete if it is not instantaneously passed-through. In this case, price transmission could be incomplete in the short-run but complete in the long run when price transmission occurs completely after a time lag (Ankama-Yeboah, 2012; Lohano & Mari (2012)).

Another important issue the definition of perfect market integration brings out is the speed by which prices adjust to the long-run relationship which also varies as a result of reasons such as policies, the number of stages in marketing and delays in transportation or processing (Serra et al., 2006). Acquah et al., (2012) and Shrestha, Huang and Ghamire (2014) argue that the shorter the time lapse for long run price transmission to be complete, the better, since longer time lapse sends out inaccurate price signals that might mislead farmers in their marketing decisions.

In the case of market segmentation, on the other hand, there is absence of any price relationship and wide price differentials exist between two markets linked by trade (Dercon, 1995). Dercon, however, notes that this is rare and may only occur under situations of natural calamities or civil conflicts. Mose (2007) asserts that in the real world neither perfect integration nor segmentation has been observed, instead varying degrees of integration that occur between the two extreme cases are rather found. In a situation where market segmentation is proved, it provides the occasion for governments to intervene in markets with policies supposedly to promote integration (Alam & Begum, 2007).

The varying levels of integration found in real markets can be attributed to the influence of certain factors that hinder integration. Many factors are indicated in the literature, however Sexton, King and Carman (1991) categorise the factors into three as those causing markets not to be linked by arbitrage, those posing impediments to efficient arbitrage and those causing imperfect competition in markets. Too high transaction costs and

marketing margins are usually cited as the factors that hinder the transmission of price signals and prohibit arbitrage (Badiane & Shively, 1998; Rapsomanikis et al., 2003).

Among the factors that impede efficient arbitrage Lutz, Van Tilburg and Van Der Kamp (1995) mention the characteristics of agricultural production, marketing and consumption such as seasonality, inadequate infrastructure, market entry barriers and unreliable market information. The group of factors causing imperfect competition in markets includes collusion among traders and poor market information which result in greater price uncertainties and consequently hinder market integration (Alam & Begum, 2007; Shrestha, Huang & Ghamire, 2014). The micro-level realities of food produce markets in much of the developing world and for that matter, in the Brong Ahafo region of Ghana may include most of these factors and the markets may have low levels of market integration.

Nonetheless, Mose (2007) cautions that the co-movement of prices between markets in different locations or spatial market integration may not always signify a price relationship as this can also happen when there is no direct causation. The reasons attributed to this include seasonality in agriculture where markets that are not connected experience common price changes arising from similar supply variations as a result of droughts or rainfall. Monopoly control by the private sector or by a state marketing board and inflation are other reasons given for the co-movement of prices between markets (Acquah et al., 2012; Jaleta & Gebremedhin, 2012).

Market efficiency is established when prices in two different markets differ by transfer costs (Rapsomanikis et al., 2003). Kanakaraj (2005) describes an efficient agricultural market as one where there is a uniform price for an identical product prevailing in the entire market area. Mensa-Bonsu et al. (2011) report that market efficiency is based on the premise that if any two markets are integrated, a price change in one of them will be reflected in a price change in the other and the price differences between the given markets would represent only transportation costs and normal profit. Therefore, markets function efficiently when they are integrated in price relationships and the more integrated a market is the more efficient it is since it tends to be more competitive (Shrestha et al., 2014).

Barrett (2001) and Barrett and Li (2002) make an important distinction between market integration and market efficiency by pointing out that while market integration is established only when tradability and non-zero trade flows conditions are satisfied, efficiency is established when prices in two different markets differ by transfer costs. However, an integrated market system has become synonymous with an efficient marketing system. Lohano and Mari (2012) point out that spatial market integration of agricultural markets has been largely used as an indirect measure of market efficiency. Furthermore, Ankama-Yeboah (2012) asserts that spatial market integration is an indicator for measuring market performance. In the view of Bylund (2015), the market may be efficient; however, the existence of transaction costs can make it costly to bring about the perfect competitive market structure.

North (1992) writes that the degree to which the competitive structure of a market attains the conditions of a zero-transaction-cost point can be used to measure the efficiency of a market. The competitive structure approaches a zero transaction cost point through arbitrage and information transmission (Ahmad, 1995). Ahmad further points out that in reducing transaction costs, efficient marketing executes various functions like assembling, transportation, storing and distribution at the least cost and therefore helps to reduce the market margins and wastages. Federico (2007) also explains that market efficiency is dependent on the number of traders and the level of competition among them as well as the amount and costs of information at their disposal, among other things.

Market efficiency has been found to be of great importance in agricultural marketing in relation to farmers' response to agricultural production and marketed surplus. Economic theory postulates that the proper functioning of markets is necessary for the optimal allocation of resources (Abdulai, 2000). Kanakaraj (2010) argues that an efficient marketing system in the agricultural sector is necessary in order to keep the pace of agricultural growth. Moreover, Alam and Begum (2007) explain that it is the realisation of remunerative prices an efficient marketing system which encourages farmers to produce more and gain greater marketable surplus and profits.

Subsequently, Mensa-Bonsu et al. (2011) reiterate the point that effective and efficient marketing and distribution systems are prerequisites for the desired agricultural growth to be realised in developing countries. In the case of Ghana as a developing country, the fact that the economy is basically

agrarian with agriculture significantly contributing to the economy makes improvement in the efficiency of its agricultural and food produce markets relevant for growth (Acquah et al., 2012; Ankama-Yeboah, 2012).

Beyond the agricultural sector, Landes and Burfisher (2009) find that more efficient agricultural marketing produces increases in output and wages in the wider economy, thereby raising agricultural producer prices and reducing consumer food prices. Therefore, improving agricultural marketing efficiency enhances social welfare by enabling local farmers to generate more income. Even though marketing efficiency benefits overall welfare (Lohano & Mari, 2012), Abankwah, Fialor and Aidoo (2013) point out that increases in profits for one group of market participants often mean losses for another group. It may be that in an efficient marketing system, traders are benefiting at the expense of farmers or vice versa.

Unlike general marketing theory, agricultural marketing as a discipline has not paid much attention to competitive strategies. In recent times, competition has become important in agricultural marketing as a result of the need for expansion or maintenance of market share (Crawford, 2006). Competition is another marketing mechanism, like arbitrage, that causes prices to converge by limiting the divergence of prices of similar commodities (Barrett, 2005; Pippenger & Phillips, 2007). Scrutinising the concept is important for a good understanding of how competition affects market efficiency.

The literature indicates that there are levels of competition ranging from perfect to imperfect competition. Ludicke (2006) describes a perfectly

competitive market as one in which no participant can influence prices while imperfections of market competition are described as any deviation from the assumptions of perfect competition. The characteristics of a competitive market include free flow of information, no barriers to entry, homogeneity of products traded and a large number of buyers and sellers (Alam & Begum, 2007; Atingi-Ego et al., 2006; Ludicke, 2006). Furthermore, Atingi-Ego et al. identify the similarity between market competition and price arbitrage by recognising that the characteristics of perfect competition also imply price arbitrage.

As agricultural marketing seeks to create equilibrium between production and consumption, a competitive agricultural market helps to ensure an efficient allocation of resources in order to maximize aggregate benefits for market participants (Barrett, 2005). However, the magnitude of welfare accruing from the market to various market participants and other economic agents is not the same but differs. Kanakaraj (2010) notes that the type of market competition prevailing between the contracting parties is the main determinant of the level of benefits a market participant receives. Therefore, whether there will be an increase in revenue to farmers, a decrease in prices consumers pay or an increase in profit for middlemen or a combination of all these possibilities depends on the type of competition in the market (Crawford, 2006).

Nonetheless, agricultural markets normally have non-competitive structure which is conventionally associated with the failure to promote liberalised competitive markets (Atingi-Ego et al., 2006). Alam and Begum

(2007) argue that imperfect market competition in the agricultural sector creates the opportunity for traders to reap abnormal profits and farmers are deprived of their due share in consumers' paid prices. Moreover, the non-competitive structure of agricultural markets tends to result in substantial price uncertainties and segregation of markets (Pippenger & Phillips, 2007).

In agricultural marketing theory, like general marketing theory, profit is a significant objective and the main distinction in marketing objectives is 'profit' versus 'non-profit' (Kanakaraj, 2010; Meulenberg, 1986). Nevertheless, Meulenberg categorises farmers into three as profit-maximizing specialised farmers, satisficing part-time farmers and organic food farmers who have varying levels of a combination of profit and non-profit considerations in their marketing objectives. Crawford (2006) asserts that on the whole, profit-maximising specialised farmers represent most food produce farmers whose primary interest is in getting the best return from their produce.

Ahmad (1995) argues that fair and stable prices are the most important factors that determine the profitability of an economic venture and can be achieved only through well integrated and efficient marketing. According to Alam and Begum (2007), the sense of fairness created by the efficient functioning of agricultural markets for farmers can boost the confidence in applying innovative ideas and technology to improve production in anticipation for higher incomes. Therefore, farmers' interest in getting the best return from farm produce can best be protected if farmers are paid appropriate prices for the produce. Jaleta and Gebremedhin (2012) also point out that in playing the important role of facilitating the exchange of goods and services,

markets can be welfare-enhancing for farmers and other actors involved in the exchanges.

Assessment Methods of Agricultural Marketing Performance

Assessing the performance of agricultural markets has been of importance to various stakeholders such as theorists, entrepreneurs and policy makers especially in countries whose economies are mainly agrarian in nature. Even though the term “market performance” has not been found to be used much as such in economics and business literature (Smits & Weigand, 2010; Jabbar, Tambi & Mullins, 1997), it occupies an important place in agricultural growth. This is because of the unique role agricultural marketing plays in agricultural growth and development in general. Abankwah et al. (2013) indicate that the performance of a market should describe “how well a market does” which is also a situation that economists traditionally believe there is efficient allocation of supply and demand.

O'Hara (1997) argues that due to the diverse nature of market participants and other stakeholders with multiple and often conflicting goals, assessing the performance of agricultural markets requires simplification. Friedman (2007) corroborates the view that there is need for clarity about what dimensions of ‘good performance’ to be assessed and the fact that all stakeholders should have objective ways to measure market performance of different market types. Since the performance of the marketing system requires analysis and evidence, a number of models from various theories have been applied to study markets mainly according to the particular emphasis or focus of various theorists (Ahmad & Shamsudin, 2008). The structure-

conduct-performance (S-C-P) paradigm and the functional, institutional and commodity approaches are the four key ones identified in the literature.

In assessing market efficiency, earlier attempts applied the theory of the firm and concentrated on the internal technical and operational efficiency of marketing firms (Jabbar et al., 1997). Jabbar et al. explain that the combined effect of the measurement of the internal and operational efficiency gave a good indication of the productive efficiency of firms in the earlier times. Such assessments, however, were limited to the firm level and did not take into consideration the fact that markets were systemic and all elements within them were interlinked (Mose, 2007; Zaibet, Boughanmi & Habib, 2005). The assessment methods failed to capture the influence the relationships among firms in a market system have on market performance.

Markets are also analysed using the industrial organisation theory since markets are conceived as systemic in the 1960s. The industrial organisation theory is built on the theory of the firm in examining the structure of, and boundaries between, firms and markets (Tirole, 1993). The theory posits that the structure of a market influences the conduct of firms within a market, which in turn influences the market performance (Ahmad & Shamsudin, 2008). Based on this theory, Bain (1951), Clodius and Mueller (1961) and Slater (1968) developed a model for market analysis known as the structure-conduct-performance (S-C-P) model. The model postulates that there is a predictable relationship between the structure of an industry, the conduct or behaviour of firms within that industry and the performance of the firms or industry sub-system (Abankwah et al., 2013).

As Ortiz et al. (2010) argue, relationships as social institutions are important for understanding the efficiency of the market system. However, the focus of attention in measuring marketing efficiency in the S-C-P model is on commodity price movement to identify the extent to which imperfections exist within the requirements of 'perfect competition' model (Lelissa & Kuhil, 2018; Smits & Weigand, 2010). Therefore, S-C-P model is not very helpful in understanding the behaviour of agricultural markets in developing countries.

Kohls and Uhl (1985) suggest the three approaches of institutional, functional and behavioural systems for the study of agricultural and food markets. According to Kohls and Uhl, the functional approach breaks down a complex marketing task into its component functions and considers the jobs that must be done, but not the agency that performs them. However, Crawford (2006) and Lyon (2000) argue that the functional approach has a fragmentary view of the marketing process with no relativity unless care is taken to bring all factors together bearing in mind that the performance of one function often influences the method of performing others.

The institutional approach, on the other hand, takes into account the personal element in the marketing process and brings attitudes into the analysis of the marketing problem (Ahmad, 1995; Kamarudin & Ismail, 2002). Kamarudin and Ismail indicate that the institutional approach to market analysis is developed from the argument that it is the power structure of the society that determines the economy and market performance. Therefore, the institutional methodology is holistic because it focuses on patterns of relations among the different parts to the whole system and these inter-relations

describe the whole parts systematically (Hani, 2012). It implies the approach allows the analysis of the interface between the farmer and other actors in the marketing system such as traders and consumers.

In recent years, there has been increasing recognition of the importance of institutions and their impact on trader behaviour (Gabre-Madhin, 2001; O'Hara, 1997; Singh, 2009). In order to understand the interrelationship between the farmer and the trader and how the farmer benefits from the efficiency of the market system, the institutional approach to the study of markets seems relevant for this study. Food produce marketing could be examined within this framework to identify its level of efficiency and potential for supporting agricultural growth and poverty reduction in the Brong Ahafo region of Ghana.

Emerging from the discussion on agricultural marketing theory and the assessment methods are certain key concepts such as marketing system and food produce marketing. Scrutinising these concepts and their features is therefore important. It helps to appreciate the dynamics of the marketing activities for the proper analysis of the efficiency of the marketing processes and their potential to support agricultural growth and poverty reduction.

Related Concepts

Marketing System Concept

A market system is seen as a systematic process that enables sellers and buyers to interact and negotiate transactions. Watson (1996) and Mohyud-Din and Badar (2011) indicate that the marketing system constantly changes as it responds to both endogenous and exogenous factors embedded in

the social context it operates in. According to Kotler and Keller (2011), the relationship between sellers and buyers within the marketing system can be represented by four flows as shown in Figure 1. The market system therefore comprises of sellers who send goods and services and communications to the market in exchange for money and information from buyers.

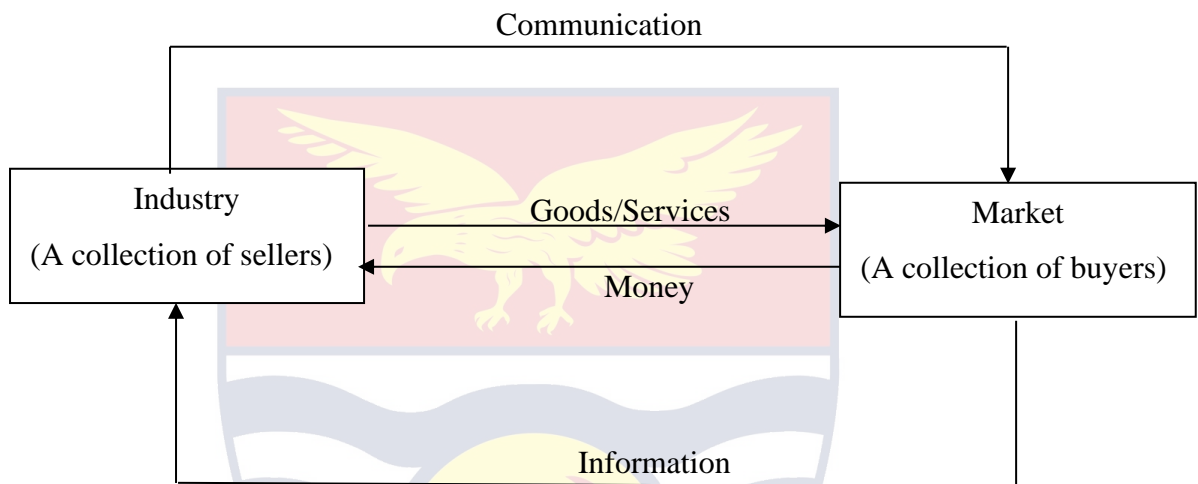


Figure 1: Simple Marketing System

Source: Kotler and Keller (2011)

Food Produce Marketing Concept

Bateman (1976) describes agricultural marketing as basically concerned with government policies towards distribution and processing of farm produce. As part of agricultural production or farm produce that is utilised as food by humans, food produce or food staples comprise of both crop and animal production. Food crop produce is made up of such categories as cereals, legumes, vegetables, roots and tubers while the animal products include livestock and poultry (Diao et al., 2008; Meulenber, 1986).

The concept of agricultural and food produce marketing has become broader than its earlier orientation towards logistics and policy. Uduji et al. (2012) explain the concept of food produce marketing as the performance of all business activities that direct the flow of food produce and services from the point of initial production till they reach the ultimate consumer or user, just like agricultural marketing. It therefore includes all activities that are involved in transforming, storing, grading, transporting and distribution of food produce and services related to agriculture from producers to consumers, either foreign or domestic (Aina et al., 2012; Mohy-ud-Din & Badar, 2011). Furthermore, Wongnaa et al, (2014) indicate that food produce marketing ensures that consumers acquire food produce in the form, places and time desired.

Theory of Relationship Marketing

The theory of relationship marketing is essential to the marketing of food produce since market channels are made up of sets of interdependent organisations and the importance of the interdependence of market channel members has been emphasised in the literature (Stern, El-Ansary & Coughlan, 1996). Relationship marketing theory postulates that customers and sellers are long term partners in an exchange process based on trust and rooted in the marketing concept (Murphy, Laczniak & Wood, 2007). As most food produce sales are based on relational contracting between farmers and traders (Haji, 2008), relationship marketing theory thus provides a basis for analysing the relationship between the farmer and the trader.

This study also examines the relationship between food produce farmers and traders, thus, the theoretical perspective of such a relationship

becomes important. The term ‘relationship marketing’, as a modern concept in marketing, is known to have first appeared in the marketing literature in 1983 in a paper by Berry (1983) (Maxim, 2009; Zontanos & Anderson, 2004). However, it has been argued by several writers that relationship marketing is an old idea that has accompanied commerce since its beginnings.

For instance, Christopher, Payne and Ballantyne (2002) have indicated that the emergence of the concept of relationship marketing was a rediscovery rather than a discovery and that relationship marketing has been described as a ‘new-old concept’. Similarly, Gummesson (2008) explains that relationship marketing is only a new term that has been used to describe an old phenomenon which has existed for a long time in commerce under different descriptions. Corroborating this view point, other researchers have contended that relationship marketing is a rebirth of marketing practices of the pre-industrial age since relational-based exchange has rather been the norm before the emergence of transaction-based marketing in the early 1900s (Palmatier, 2008).

Nonetheless some writers describe relationship marketing as a recent phenomenon because it has taken a new focus which has occasioned a significant paradigm shift in both theory and practice of marketing (Berry, 1995; Gronroos, 1999; Murphy et al., 2007). The emergence of modern relationship marketing as an identifiable academic domain of marketing has many historical antecedents. Berry as well as Murphy et al. mention that services marketing has provided the stimulus for the development of relationship marketing while others like Christopher et al. (2002) and Kanagal

(2009) add industrial marketing as another stimulus. However, Brito (2011) mentions distribution channels, industrial marketing and services marketing as the three main conceptual origins of relationship marketing.

Besides distribution channels, industrial marketing and services marketing as antecedents of the relationship marketing concept, other factors are observed to have facilitated the emergence of the concept. Among these factors are increasing discontent with the traditional model or the transactional approach of marketing as the general marketing theory, improvements in information and communication technologies, increased global competition, and faster product commoditisation (Gummesson, 2008; Hindley & Lindgreen, 2002; Nwakanma & Jackson, 2007). Maxim (2009) argues that as a consequence of such socio-economic changes, the paradigm shift of marketing has been from the area of transactions to that of relationships.

The marketing literature indicates that relationship marketing theory continues to evolve and is becoming more pervasive having taken a central place in marketing theory and practice (Murphy et al., 2007; Palmatier, 2008). Murphy et al. further explain that relationship marketing has become ubiquitous because it has been shown to be applicable to all sectors of marketing including consumer goods, services and business-to-business settings.

As the traditional views of marketing slowly gives way to a new era of marketing, Nwakanma and Jackson (2007) argue that the process aspect of marketing which comprises of both transactional and relational attributes are increasingly becoming prominent and thus conclude that “relationship

marketing is the key to success under this new era of marketing” (p. 56). Gummesson (2008) and Brito (2011) agree with this opinion and explain that relationship marketing continues to assume a central place in both marketing theory and practice so long as firms increasingly recognise the importance of interaction with customers.

Egan (2008) mentions a number of authors who cite the lack of empirical evidence to support the argument that relationship marketing is not yet a theory. Such authors argue that relationship marketing only seeks to practicalise the accepted view of marketing regarding servicing and satisfying buyers through relationships for the mutual benefit of sellers and buyers and that transactional marketing is still being applied in mass marketing by some large producers (Maxim, 2009). Arguably, the two viewpoints share some commonalities which suggest that relationship marketing and transactional marketing will continue to coexist for some time while relationship marketing is likely to take an increasingly overriding position in marketing theory and practice (Kanagal, 2009).

The term relationship marketing has been variously defined since the first definition given by Berry (1983) as attracting, maintaining and, in multi-service organisations, enhancing customer relationships (Harker & Egan, 2006; Zontanos & Anderson, 2004). Researchers are coming to the consensus on the definition of relationship marketing as essentially consisting of a close long-term relationship between various participants involved in exchange of something valuable in the market process (Hunt, Arnett & Madhavaram, 2006). Furthermore, Murphy et al. (2007) observe that most of the definitions

signal that there are separate stages of a relationship such as its establishment and maintenance.

Earlier definitions indicate three stages of the relationship lifecycle but most of the recent ones imply four stages by including the element of termination of the relationship. Morgan and Hunt (1994, p. 22) suggest that “relationship marketing refers to all marketing activities directed towards establishing, developing, and maintaining successful relational exchanges”. Subsequently, Kanagal (2009, p. 1) defines relationship marketing as “the identification, establishment, maintenance, enhancement, modification and termination of relationships with customers to create value for customers and profit for organisation by a series of relational exchanges that have both a history and a future.” This definition essentially indicates four stages of the process of relationship marketing as identifying, developing, maintaining and terminating. It is this definition that this study adopts.

Kotler and Keller (2006) write that relationship marketing aims to develop long term relations that are mutually satisfying with key players who may be customers, suppliers or distributors for the benefit of earning and retaining businesses. According to Nwakanma and Jackson (2007), the marketing concept proposed by Kotler (2000) that states that the best way to achieve an organisation’s objectives is by satisfying its customers is the marketing philosophy that helps to explain why sellers should engage in relationship marketing. Thus, relationship marketing tends to concentrate on efforts of sellers, but also of buyers to some extent, to invest in longer term

streams of mutually profitable partnership behaviours rather than single transaction consummation (Gronroos, 2007).

Therefore, for the seller, relationship marketing is the process of creating special personal ties while the buyer considers it as a chance to communicate needs to be fulfilled (Nwakanma & Jackson, 2007). Maxim (2009) argues that unlike transaction marketing, the emphasis of relationship marketing is not just to attract new customers but also to retain them and know them better over time. Such long-term relationships, as Kanagal (2009) maintains, are beneficial for all those involved in terms of increasing turnover as well as reducing costs.

One major critique against relationship marketing relates to its tendency to raise barriers against competition and reduce price competition (Vanetis & Ghauri, 2004). It is argued that such a situation may occur while relationship marketing is creating competitive advantage and improved framework for cooperation, information sharing and mutual learning for exchange partners (Boniface, Gyau & Stringer, 2009; Cambra-Fierro & Polo-Redondo, 2008). Relationship marketing may thus appear to be reducing the effectiveness of competition in the marketing system.

Relationship marketing comprises of several attributes which must be present in order for it to be successful. Discussing from an ethical point of view, Murphy et al. (2007) indicate that for it to operate as intended, relationship marketing appears to hinge on three indispensable virtues that must exist together and these include trust, commitment and diligence. Additionally, elements like equity and involvement and satisfaction play

different roles in customer relationships (Kotler & Keller, 2006). This is corroborated by Nwakanma and Jackson (2007) who also mention attributes such as trust, commitment, empathy and responsiveness to customers' needs as components of relationship marketing.

Another factor that has been indicated as a component of relationship marketing is power. For instance, Thorelli (1986, p. 38) argues from the perspective of political economy that "Power is the central concept in network analysis" and in any relationship, power exists and influences others. However, Morgan and Hunt (1994) contend that "the presence of relationship commitment and trust is central to successful relationship marketing, not power and its ability to 'condition others'"(p. 22). Thus, this has been criticised from the standpoint that power tends to produce failures in relationships and the focus should rather be on whatever generates relationship marketing successes and not failures (Maxim, 2009).

Spekman, Isabella and MacAvoy (2000) maintain that trust and commitment are indispensable elements of alliances and suggest that no relationship can exist without trust and commitment. Hunt, Arnett and Madhavaram (2006) go further and classify a number of such factors that influence relationship marketing success into eight, namely relational factors, resource factors, competence factors and internal marketing factors. Others are information technology factors, market offering factors, historical factors and public policy factors. Among these, the relational factors, such as trust and commitment, are considered to have the most influence on the success of relationship marketing (Hunt et al.). Palmatier (2008) indicates that

relationship marketing effectiveness has three major drivers and these include relationship quality, breadth, and composition.

Relationship Quality

Since the concept of relationship quality was presented in 1985 by Gummesson (2002), it has become one of the pillars of relationship marketing. Vieira, Winklhofer and Ennew (2008) indicate that the concept is useful and appropriate in situations where frequency, uncertainty and specificity are the features of market relationships, making it necessary to have good interpersonal interactions and dependence on trust. Such situations are common in the food produce marketing in many developing countries (Sahara et al., 2013) like Ghana, where farmers and traders depend on trust in many of their transactions.

The importance of relationship quality in marketing performance has been amply demonstrated in the marketing literature. The literature shows that relationship quality between suppliers and buyers is a major contributor to the success of long-term trade (Morgan & Hunt, 1994; Kwon & Suh, 2004). Magistris and Gracia (2008) and Boniface et al. (2009) write that enhanced relationship quality promotes mutual learning and competitive advantage for the members. Additionally, Foundjem-Tita et al. (2012) mention that traders stand to gain from other advantages such as quality produce and improved delivery when there is enhanced relationship quality.

Murphy et al. (2007) indicate that relationship quality usually results in lower transaction cost and increased exchange efficiencies. In this wise, Vieira et al. (2008) explain that transaction costs are reduced when improved quality

of the buyer-seller relationships creates a situation where farmers and traders better share information and reduce searching costs. Moreover, Sahara et al. (2013, p. 5) refer to the concept as “an overall assessment of the strength of a relationship and the extent to which it meets the needs and expectations of the parties based on a history of successful or unsuccessful encounters or events”.

Yet relationship quality may also produce unfavourable outcomes for farmers in some circumstances. Lyon (2000) indicates that when farmers benefit from having guaranteed buyers due to improved relationship quality, they may become less sensitive to price. Farmers of perishable food produce like plantain and tomato, especially, are willing to accept any price offered in order to continue enjoying reduced risk (Maxim, 2009).

Boniface et al. (2009) also argue that improved relationship quality can create barriers against competition and reduce price competition which may result in lower prices for farmers. It is explained that when farmers become more familiar with their traders over time, the traders begin to take advantage of them and offer lower prices (Foundjem-Tita et al., 2012). This implies that improved relationship quality does not necessarily guarantee higher prices for farmers.

The relationship quality is a composite construct and it has been found to represent the caliber or stature of relational bonds between partners in an exchange relationship (Kumar, Scheer & Steenkamp, 1995). It captures the various dimensions of a relationship needed to create relational bonds of high-caliber, which may include commitment, trust, relationship satisfaction, reciprocity norms and communication (Hunt et al., 2006). Palmatier (2008)

elaborates that relationship quality has a stronger impact on relationship performance than any single dimension of a relationship and suggests that these dimensions forming relationship quality may be synergistic. Thus, higher relationship performance is likely to happen when attention is paid to the improvement of the dimensions of relationship quality.

Nonetheless, there appears to be little consensus concerning the various dimensions and determinants of relationship quality because relationship quality is context specific and has been expressed by several distinct but related constructs (Crosby, 1989; Kwon & Suh, 2004). Many factors in different combinations have been used to represent the dimensions of relationship quality in the literature. Vieira et al. (2008) write that a combination of satisfaction and trust as first order dimensions of relationship quality is used in analysis by researchers almost as often as the combination of satisfaction, trust and commitment. These three variables have also been referred to as the building blocks of relationship quality. Relationship quality as modeled by Vieira et al. is shown in Figure 2.

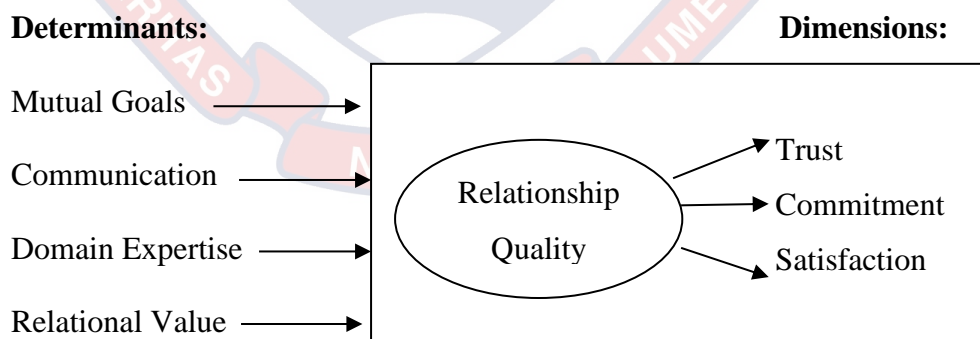


Figure 2: Core Model of Relationship Quality and its Key Determinants

Source: Vieira et al., 2008

Trust

The concept of trust has been defined in the Oxford Advanced Learner's Dictionary of current English as "a firm belief in the reliability, truth or strength of a person; a confident expectation; and a reliance on the truth of a statement without examination"(Hornby, 1995). From an ethical standpoint, Murphy et al. (2007) describe trust as a certain expectation and confidence about the behaviour of others and an implicit vulnerability to that person's actions. Vieira et al. (2008) also define trust as "the ability and willingness to rely on the relationship manager's integrity and behaviour (i.e. trustworthiness) so that the long-term expectations of the buyer will be met" (p. 11).

Trust functions where there is confidence in other agents, in spite of uncertainty, risk and the possibility for relationship partners to act opportunistically (Misztal, 1996). Batt (2003) agrees and adds that there is also an expectation that one's vulnerability resulting from any risk will not be taken advantage of by others in the exchange relationship, even though the risk of opportunism will always be present. According to Kwon and Suh (2004), information sharing and believe in the content of information shared are enhanced in high-trust exchange relationships and these boost up overall performance.

Trust therefore enables farmers and traders to honestly share market information and makes it unnecessary to scrutinise every detail of information provided by farmers or traders during transactions. It is in this sense that Lyon (2000) observes that trust plays a major role in cutting down transaction costs

as it reduces the need for monitoring, especially when transactions are complex and involve long distance trade. This is particularly important for perishable food produce such as plantain and tomato that are mainly marketed through the long distance trade system. Subsequently, Nwakanma and Jackson (2007) assert that trust is a key element for a successful relationship marketing programme.

Furlong (1996) argues that the concept of trust has been ignored in a lot of economic research as a result of the neoliberal theoretical assumption of conditions of perfect competition for efficient markets. With this assumption, the question of trust does not arise in transactions since the relationship between agents is not seen to be affected by interpersonal behavioural traits such as dishonesty. However, in many developing countries like Ghana and in the food produce marketing system where a formal system of contracts scarcely exists, trust is commonly applied to conveniently carry out transactions (Murphy et al., 2007).

It is widely acknowledged that the establishment of trust leads to commitment such that without trust, there will be no commitment among relationship-connected stakeholders (Morgan & Hunt, 1994). Nwakanma and Jackson (2007) explain that commitment and trust make it worthwhile for market participants to work at preserving relationships and to resist attractive short term alternatives as well as view potentially high risk actions as prudent. Commitment and trust combine to represent the key factors that engender outcomes which promote efficiency, productivity, and effectiveness and

consequently explain a relationship's impact on performance (Palmatier, 2008).

Commitment

Relationship commitment is presumed to be central to relationship marketing. The characteristics of commitment are seen to be stability, sacrifice and loyalty (Gundlach & Murphy, 1993). Commitment has been defined as “an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it; that is, the committed party believe that the relationship is worth working on to ensure that it endures indefinitely” (Morgan & Hunt, 1994, p.23). Murphy et al. (2007) have identified commitment as a necessary requirement for ethical relationships.

According to Nwakanma and Jackson (2007), commitment concerns with the desire of a firm to maintain a long-term relationship with its customers. Further to that, Magistris and Gracia (2008) explains that commitment denotes the relational motivation of partners in an exchange relationship when they regard the relationship as valuable. Therefore, when relationship partners are committed extra effort is expended to maintain and strengthen relational bonds, which yield positive outcomes such as cooperation, financial performance, and others. Boniface et al. (2009) assert that no relationship partner can determine the duration of the relationship and consequently the long term viability of the firms involved if there is no commitment.

Satisfaction

Satisfaction or relationship satisfaction is the assurance of a good performance that a buyer perceives of a seller in the future as a result of a consistently satisfactory past performance (Vieira et al., 2008). Palmatier (2008) also describes relationship satisfaction as a customer's affective or emotional state toward a relationship where the customer may be pleased or not with the relationship. Gyau and Spiller (2008, p. 178) give a common and a more general definition of satisfaction as "a positive affective state resulting from the appraisal of all aspects of a firm's working relationship with another firm".

Geyskens, Steenkamp and Kumar (1999) and Morgan and Hunt (1994) classify relationship satisfaction into two types, which are economic and non-economic satisfaction. In distinguishing between the two, Sahara et al. (2013) indicate that economic satisfaction refers to the positive emotional response of a market channel member to the economic rewards from the relationship with its partner, which may be in terms of sales volume, price and profit margins. Conversely, non-economic satisfaction refers to the positive emotional response of a market channel member to the non-economic, psychosocial aspects of its relationship such as respect, pride and reputation (Sahara, et al.).

Subsequently, many researchers conclude that improving relationship quality among farmers, processors, wholesalers and retailers at points along the value chain has the potential of boosting market efficiency through the reduction of transaction costs (Fischer & Reynolds, 2010; Giha & Leat, 2010; Gracia, Magistris & Albisu, 2010). Thus this research seeks to capture the

relationship quality between food produce farmers and traders and how this provides an incentive for farmers' decision to produce more.

Assessment of Relationship Quality

Relationship quality between buyers and sellers has been an area of research interest in the industrial and agricultural sectors as a result of its importance in these sectors (Batt, 2003). In spite of the fact that it has been proven that efforts to improve relationship quality between buyers and sellers may be more productive than conventional marketing investments, only a few studies have focused on buyer-seller relationships in smallholder agriculture in developing countries (Bijman, 2008; Gyau & Spiller, 2007). This research attempts to fill this gap by focusing on an assessment of the relationship quality between smallholder food crop farmers and traders.

Essentially, relationship quality is an interaction assessment in specific contexts. Two main contexts emerge from the literature where in one, the assessments are for specific outcomes of the relationship such as Moorman, Zaltman and Deshpande (1992). In the other context, the assessments concern the evaluation of the relationship over a period of time and examples include Foundjem-Tita et al. (2012) and Sahara et al. (2013). This type of assessment suggests that a joint evaluation which reflects the two-way nature of relationships is more useful.

Vieira et al. (2008) assert that buyer or customer only perspectives have characterised the approaches that have been used in assessing relationship quality. This has been attributed to the fact that it is difficult to collect and analyse data from both sellers and buyers. Magistris and Gracia

(2008) also explains that since it is recognised that the goals of relationship marketing is not selfless but that the party which initiates the relationship has its own expected goals, a one way perspective focusing on the implementer is expected and even relevant. It may be reiterated that both parties in most effective relationship marketing benefit from the relationship even if the benefit for one party is only in terms of social rewards (Boniface et al., 2009). Thus, it is relevant to assess the quality of the relationship from the perspective of either party or both.

Another important aspect of the assessment of relationship quality relates to the unit of analysis which has shifted from the single isolated transaction to the level of relationship (Moorman et al., 1992; Zontanos & Anderson, 2004). The level of relationship may be assessed between individuals or interpersonal, between an individual and a firm or a group of persons, and between firms or interfirm. Additionally, Palmatier (2008) observes that most theoretical and empirical researches in relationship quality apply models of interfirm and interpersonal relationships.

In as much as there is no consensus on the best way to assess the level of relationship quality, researchers have commonly used commitment, trust and satisfaction as the three variables for the assessment. Among the few studies conducted in agricultural business to measure the level of relationship quality between farmers and traders, some studies such as Batt (2003) and Gyau and Spiller (2007) have used trust as a proxy for relationship quality. Others have modelled trust and commitment or trust, commitment and satisfaction as dimensions of relationship quality. However, according to

Vieira et al. (2008), the majority of more recent researches do employ trust, commitment and satisfaction.

Due to the complex and dynamic nature of relationship marketing phenomenon (Lewin & Johnston, 1997), the qualitative and inductive research methodology has been suggested for the assessment of relationship quality (Hindley & Lindgreen, 2002; Lyon, 2000). As an evolving theory, studies of relationship quality benefit from such an exploratory approach to building theories by enabling one to explore local conceptions and to understand social processes from the respondents' point of view. Many studies on relationship quality have applied both qualitative and quantitative methodologies in order to capture background characteristics, marketing and production arrangements of respondents as well. This study also adopts the qualitative and quantitative methodologies to analyse the relationship quality between food produce farmers and their traders,

Theory of Agricultural Household Decision Making

This study seeks to understand how food production decisions are made at the micro level in response to both external and internal factors. The theory of agricultural household decision making becomes an important theory to consider for a better understanding of the interface between the marketing and the production of food produce at the household level. In this wise, the various assertions, assumptions and critiques of the theory that are relevant for this study will be discussed.

Farmers make decisions concerning such issues as what to produce, input use, harvest and post-harvest of food produce which affect production,

processing, distribution, prices and costs (William, 2003). In making these decisions, farmers do not use a linear process but simultaneously make decisions on these issues which can be broadly categorised as production, consumption, and market participation (Taylor & Adelman, 2003). Koppelman and French (2005) note that it is at the agricultural household level that all farm decisions are made and for this reason the household is sometimes considered a system of resource allocation. Agricultural household theory, thus, provides a framework for analysing household behaviour that integrates these decisions.

Agricultural or farm household behaviour was first understood in the framework of household-firm by Chayanov (1925) and Nakajima (1957) until Becker (1965) formulated the unitary household approach. The unitary household approach postulates that “members of a household behave as though they maximize a unique utility function under the constraint of a family budget” (Dauphin, 2001, p3). Findeis, Swaminathan and Jayaraman (2003) observe that the unitary household approach has formed the foundation for the agricultural household theory.

Agricultural household theoretical framework is increasingly being used for microeconomic study of smallholder farming. According to Taylor and Adelman (2003) and William (2003), the theory recognises that the household is both a producer and a consumer and as such production and consumption decisions are linked. Thus, the household makes decisions on the allocation of inputs for food production while at the same time deciding on how to allocate income from farm profits and off-farm work to the

consumption of commodities and services including leisure. With respect to production, Donnellan and Hennessy (2012) assert that households decide to allocate members' time or labour between on- and off-farm employment as well as between work and leisure in order to maximize utility.

Mendola (2007) affirms that the agricultural household decision making theory explains the behaviour of agricultural households as consumption and production units in both perfect and incomplete market settings. Similarly, Robles and Torero (2010) note that most farm households in developing countries market the surplus farm output remaining after consumption of the farm output produced by the households. However, this general practice may differ from place to place since in Ghana a common practice among farm households is to select the best of the produce for the market and consume what remains. The theory is, thus, applicable to agricultural households that are not commercialised but consume sizeable quantities of their farm output or supply some of their own inputs, whether in developed or developing countries (Tzouvelekas, 2011).

The theory of agricultural household decision making posits that agricultural households have an objective function to maximize albeit with a set of constraints (Findeis, Swaminathan & Jayaraman, 2003). In the neoliberal viewpoint, agricultural or farm households aim to maximize utility and are faced with technology, time, budget and market constraints in this pursuit (Enete & Amusa, 2010; Tiberti & Tiberti, 2015). In effect, the constraints affecting agricultural household behaviour include natural,

technological, social and market factors which agricultural households deal with when making resource allocation decisions in order to maximize utility.

Market constraints faced by agricultural households have long been acknowledged in the agricultural development literature where rural markets are noted to be mostly underdeveloped or absent. Henning and Henningsen (2007) indicate that the market imperfections result in transaction costs which, when sufficiently high, may prohibit agricultural households from engaging the market to either buy or sell. Nonetheless, Mendola (2007) and Martin and Ivanic (2016) assert that when agricultural households engage food markets, they tend to be affected differently depending whether they are net buyers or net sellers and the extent to which their incomes adjust to food price changes. For instance, the impact of high food prices may benefit some households that are net sellers while net buyers are adversely affected.

By drawing from agricultural household decision making theory, the study aims to understand the way a farm household reaches its decisions for the efficiency of the farm as a firm. Therefore, the agricultural household decision making theory may help to know the assumptions that inform smallholder farmers' decision to invest in the production of food crops. In particular, there is the need to learn about the relationship between food produce marketing and farmers' decision to produce food crops towards improving agricultural growth.

Agricultural household decision making theory also known as neoclassical agricultural or farm household model is based on a set of assumptions about the workings of the household as well as the wider

economy within which smallholder production takes place (Findeis et al., 2003; Udry, 1995). One key assumption the theory makes about the household is that farm household resources are pooled together for production and consumption purposes, which is normally referred to as the unitary household approach (Ligon, 2011). In other words, the unitary household approach suggests that households behave as individuals and that household decision-making is done through a single household head. The agricultural household theory therefore presents the household like a ‘black box’ (Martin & Ivanic, 2016).

Describing the household as a ‘black box’ under the unitary household approach indicates that the approach does not consider transactions between individuals within the household in decision making (Mendola, 2007). Matteazzi, Menon and Perali (2013) argue that the approach does not show intra-household transactions due to the assumption that the basic decision unit is the household in which each individual has the same preferences and influence on resource allocation. It thus simplifies the household as if it is one individual that makes the decisions. In this regard, Johnston, Kassenboehmer and Shields (2015) opine that decision making under this approach is seen as not depending on the distribution of household resources between household members. This is because it is assumed that resources are pooled.

The unitary household approach with the ‘black box’ assumption has been widely criticised for failing to recognise the complex reality of intrahousehold resource distribution and decision making (Udry, 1995). Many gender specialists, in particular, have argued that the assumption is not

appropriate because the household which is the major area where gender relations are played out is not opened (Dauphin, 2001). Bolt and Bird (2003) support the opening of the 'black box' and explain that the household may consist of individuals with heterogeneous preferences, gendered interests, and unequal resource allocation. Thus, ignoring the potential for unequal power and resource distribution within households may conceal differential levels of participation of individual household members in decision making.

Findeis et al. (2003) note that due to its theoretical weaknesses, the unitary household approach is no longer the accepted convention that it used to be. Even though the approach is generally used to study the decision behaviour of the household, it is only because it is easy to specify for analysis (Matteazzi et al., 2013). Consequently, there have been extensions of the theory that open the 'black box' to consider the composition of the household. This, according to Johnston et al. (2015), enhances the understanding of the intrahousehold effects such as differences in labour allocations across the household, while still holding the 'black box' assumption.

Among the different models of the agricultural household decision making theory that seek to open the 'black box', Dauphin (2001) and Bolt and Bird (2003) indicate that the most significant alternative to the unitary models have been the collective models. According to Bolt and Bird, these models comprise the cooperative and non-cooperative types and focus on the interaction which occurs between individuals within the household. The collective models also relax the assumption of unified or aggregated preferences of household members (Mader & Schneebaum, 2013).

The collective models are informed by the understanding that intra-household decision making and resource allocation are affected by multiple factors such as individual agency and social difference (Udry, 1995). Johnston et al. (2015) discuss the specific dimensions of social difference which influence how individuals take part in household decision-making and affirm that they include gender, age, birth order and physical and mental disability. It thus becomes necessary for the explicit consideration of the composition of the household such as men, women and children in order to identify the roles that different individuals play in household decision making.

Enete and Amusa (2010) report that there is a division of roles and responsibilities within the household among men, women and children. It implies that different household members make various contributions such as decisions about production, provision of labour or being responsible for the use of farm produce. For instance, Sebatta, Mugisha, Katungi, Kashaaru and Kyomugisha (2014) argue that many decisions made in the household on production and marketing depend on one's position in the order of hierarchy in the household. This suggests that older members of the household are more likely to make the decision to produce and sell food produce.

Another assumption relates to the allocation of resources in the agricultural household. Udry (1995) indicates that a condition necessary for the efficiency of the allocation is that factors of production are allocated efficiently to the productive activities of the household. According to Donnellan and Hennessy (2012), the household operates to maximise its utility function and ensures that time is allocated between work and leisure in order

to maximise that utility function. In other words, farm households engage in both on- and off-farm production activities which are market oriented and subsistence in nature to make efficient use of the household labour resource, subject to full income constraints (Martin & Ivanic, 2016). Thus, agricultural household theory assumes that resource allocations within the household are efficient.

Corsi and Salvioni (2012) and Bedemo et al. (2013) support the assumption of efficient resource allocation by asserting that allocating household labour to both on- and off-farm employment makes it possible for income levels to match well with farm survival. The household therefore takes advantage of farm and alternative employment opportunities and consumes all available commodities (Tiberti & Tiberti, 2015). The assumption can be used to examine how households of food crop farmers allocate labour resource between on- and off-farm activities in the face of market constraints.

According to Mendola (2007), agricultural household theory makes efficiency a central issue in smallholder production analysis. The agricultural household decision theory assumes that the organisation of production by the household is efficient (Ligon, 2011; Martin & Ivanic, 2016). This means that the household, as a production unit, transforms its own goods and services as well as purchased resources into utilities in a manner that maximises profit or full income in a competitive economy. Thus, the assumption of the household decision making theorists can help to understand how smallholder farmers make use of both their own farm inputs and purchased ones to produce food crops to achieve maximum profit under a competitive market environment.

Besides assumptions about the workings of the household, the agricultural household theory also makes an assumption about the wider economic environment. The theory assumes that perfect markets exist for all outputs and factors of production and as such there is an absence of missing markets for outputs or inputs (Donnellan & Hennessy, 2012; Findeis et al., 2003; Taylor & Adelman, 2003). This implies that all goods are tradeables and thus prices are determined outside the household. Findeis, et al. point out that in such a circumstance, transaction costs are zero and the opportunity cost of any output or factor is its market price. Therefore, it becomes inconsequential if the household consumes all of its outputs or sells them, uses its own farm inputs like labour or sells it and replaces it with hired labour in farm production.

Under the perfect market assumption, Mendola (2007) notes that production decisions are taken independently of consumption even though consumption depends on production through the budget constraint. This interdependence of production and consumption decisions which is at the core of agricultural household theory is referred to as recursiveness or separability (Henning & Henningsen, 2007; Mendola, 2007). Thus, farm households' decisions can be either separated or non-separated from preferences under the agricultural household theory. Nevertheless, Tzouvelekas (2011) argues that the existence of perfect markets is sufficient but not a necessary condition for separability.

The issue of separability is determined by whether production and consumption decisions by the household are separately made, in which case

they are recursive or separable, or if the decisions are made simultaneously or jointly then they are non-separable (Findeis et al., 2003; Udry, 1995). However, Taylor and Adelman (2003) observe that in the real world, many agricultural households are confronted with mixed markets where both tradables and non-tradables exist. For instance, there could be situations where markets such as land are missing but markets for food produce exist which would require household decisions that are both separable and non-separable.

Non-separability occurs when the decisions the household makes about production including the use of inputs and desired production levels are affected by its consumer characteristics such as consumption preferences and demographic composition, and vice versa (Kuiper & van Tongeren, 2004; Le, 2010). Thus, household decisions on production and consumption are not determined exogenously but endogenously (Mendola, 2007). Moreover, Le writes that rural households in developing countries, especially, are regularly exposed to market imperfections and constraints. This is evidenced in the inseparable nature of most decisions that farm households make in relation to farm production and household consumption.

The sources of non-separability resulting from market imperfections or market failure can be broadly categorised as thin markets, transactions costs and risks. In rural areas in developing countries, the market may be incomplete or missing altogether or there may be high transactions costs in accessing markets including high transportation costs, and/or the risk associated with uncertain prices and the uncertain biophysical environment (de Janvry & Sadoulet, 2006; Katungi, 2007). However, according to Tzouvelekas (2011),

the agricultural household theory further assumes that household members who make production and consumption decisions are risk neutral.

Nevertheless, Mendola (2007) argues that the high risk and uncertainty that smallholder farmers experience undermines the relevance of the risk neutral assumption of the agricultural household theory. Consequently, other economists have developed the risk aversion theory, which states that “the objective function of peasant households is to secure the survival of the household by avoiding risk” (Mendola, 2007, p. 52). Thus, the theory indicates that farmers are risk averse and as Donnellan and Hennessy (2012) point out, farmers tend to allocate more time to less risky activities in order to minimise exposure to income risk. For instance, waged off-farm employment which is associated with low risks becomes attractive to farmers for which reason the theory is known to explain increased incidence of off-farm employment and uncertain production choices (Le, 2010).

Even though different farmers have varying risk tolerance levels, smallholder farmers are known to be less tolerable to risk because they are closer to the threshold in terms of savings and liquid assets (Udry, 1995). Generally, the risk bearing capacity of farming households can be explained by their socio-economic characteristics and these factors make smallholder farmers inadequately equipped against risk and uncertainties (Adubi, 2000; Ayinde, 2008). Thus, poor farm households may have survival considerations dominating their household decisions.

According to Pennings, Wansink and Meulenber (2002), the interaction between risk attitude such as risk aversion and risk perception

determines risk behaviour. Mendola (2007) also states that the risk behaviour of agricultural households is determined by their risk aversion and the availability of institutions that facilitate risk bearing. These assertions are corroborated by Gloede, Menkhoff and Waibel (2011) who indicate that risk attitudes are a major determinant for decisions under risk. In other words, these factors influence cautious production decisions of agricultural households in order to protect themselves in the absence of institutions that provide insurance. Subsequently, Girdziute (2012) argues that the concept of risk analysis is the most important step in the decision-making process necessary for profitable activities to be carried out.

Risk does not affect only farmers but is present in all agricultural management decisions as a result of different sources of uncertainty (Gomez-Limon, Arriaza & Riesgo, 2003). The theory of risks brings out an understanding of the risk factors faced by both farmers and traders and the management strategies being employed (Porter et al., 2007; Haji, 2008) which could also explain the potential of the food crop subsector to the growth of the agricultural sector. Therefore, it provides a basis for the positive relationship between marketing and production decision making of smallholder food crop farmers and agricultural growth.

Todaro (1981) writes that economists perceive risk as a situation in which the likelihood of achieving some outcome is not exactly known. Risk is perceived not only as a possibility of an unwelcome event or as an opportunity to lose, but also as an opportunity to win (Jaeger, Renn, Rosa & Webler, 2001). Even though there appears to be a general understanding of the word

risk in how it is widely used, there is no uniformity in the definitions given by experts (Hillson & Murray-Webster, 2006). Risk has been defined from both sociological and economic perspectives.

In sociological terms, Evers and Mehmet (1994) define risk as “the unintended consequences of rational action” (p. 1). Similarly, in economic terms, risk has been defined as “anything that leads to the reduction of consumption below sufficient levels” (Nehme, 2007, p. 4). Risk in the food crop sub-sector is understood in terms of the possibility to suffer losses and reduction of consumption below sufficient levels, even though the other contrasting definitions are recognised (Adimabuno, 2010). Overall, risk is perceived as the likelihood to suffer a loss (Cindyniques & Antipolis, 2008; Girdziute, 2012). Consistent with the work of Girdziute, this study uses the concept of risk as possibility to suffer financial losses.

In the literature, two broad sources of agricultural risks are identified as production and market risks. Market risks are related to price fluctuations, perishability and seasonality of supply and a change in consumer tastes (Crawford, 2006; Haji, 2008; Nehme, 2007). Production risks are also related to climatic changes particularly erratic rainfall and floods as well as pests and diseases (Laube, Awo & Schraven, 2008). Adimabuno (2010) points out that market risks are more policy oriented and the degree of impact depends on the nature of a particular country’s trade policy with the global world. It is observed that since the 1980s, the trade policy in many developing countries such as Ghana is essentially based on the neoliberal theory and thus encourages competition and free trade.

However, the World Bank (2008) indicates regulatory risks as a third source of risk by separating the policy influence on the market from market risks and therefore provides three categories of sources of risks as regulatory, price and production risks. This compares with an earlier classification of agricultural risks by Ellis (1992) which also separates social uncertainty, explained as insecurity associated with state interventions and control over resources and war, from market risks. The classification by Ellis therefore has three main sources of risks as production risks, market risks and social uncertainty (Mendola, 2007).

Market risks are borne by both farmers and traders in food produce marketing. Porter et al. (2007) argue that traders, and even more so farmers, invest their capital in high-risk environment and should therefore be compensated to commensurate the risks involved. In terms of output price risk, Haji (2008) writes that it arises as traders make purchase decisions without knowing the future selling price and it has been found to impact on the marketing margin of agricultural produce.

The perishable nature of many food produce such as plantain and tomato presents a market risk. Therefore, the level of market risk experienced may depend on the level of perishability of the food produce. For instance, tomato farmers and traders may bear higher market risks than plantain farmers and traders due to the higher perishability of tomato. Adimabuno (2010) attributes this to the non-existence of processing and storage facilities which compels farmers to sell their food produce at low prices to reduce losses. Food produce farmers also bear the risk of selling the produce on credit based on

trust (Franken & Pennings, 2005). It is possible that traders may not always pay for the produce at the price and time the farmers expect.

Risk management is relevant to entrepreneurs such as plantain and tomato farmers seeking to succeed and survive in a dynamic market since investment decisions are fundamentally risky decisions. Generally, the risk bearing capacity of the farm households can be explained by their socio-economic characteristics and these factors make the smallholder farmers inadequately equipped against risk and uncertainties (Adubi, 2000; Ayinde, 2008). The risk behaviour literature indicates that managing risk in agriculture is particularly difficult because of the differences of opinion about what risk is (Adimabuno, 2010; Girdziute, 2012). However, Girdziute maintains that the worsening climate change effects on agriculture coupled with the rapidly changing market conditions makes it all the more necessary to manage risks in order for smallholder farmers to succeed in a dynamic market.

In marketing, as well as in production, when risk-averse farmers perceive risk, they will exhibit behaviour that decreases their risk exposure such as crop diversification, pest management, reduction in production and sales, careful selection of spot transactions or fixed-price contracts (Franken & Pennings, 2005; Porter et al., 2007). According to de Janvry and Sadoulet (2006) and the World Bank (2008), such strategies which are ex-ante help to reduce exposure to risk through adjustments in income strategies whereas ex-post strategies can be asset sale, taking credit and migration to protect or smooth consumption at a given level of income.

CHAPTER THREE

EMPIRICAL REVIEW AND CONCEPTUAL FRAMEWORK

Introduction

This chapter reviews previous empirical work relating to food produce marketing, investment and food production with a focus on the three interrelated segments. It specifically captures the review of some studies on the relationship that exists between food crop farmers and traders as market channel members in food produce marketing. The review also captures the efficiency of the market and finally how farmers' production decisions are informed by price and non-price signals.

The review enables an evaluation of the research designs that have been employed in the previous studies for informed direction in this study. The empirical review concentrates on eleven studies from outside Africa, within Africa and from Ghana which highlight on the research objectives, methodologies, findings and conclusions. Lessons including gaps and areas requiring further scrutiny that are identified have informed the entry point and conceptual framework for this study.

The first group of studies reviewed comprised of the work of Lyon (2000), Foundjem-Tita et al. (2012) and Sahara et al. (2013) who studied the interrelationship between the farmer and the trader in the marketing of food and other agricultural produce. The studies mostly dwelt on the assumption that improving relationship quality between farmers and traders enhanced market efficiency.

Lyon (2000) examined the farmer-trader interrelationship with a focus on farmers, traders and input sellers in the Brong Ahafo Region of Ghana. The study aimed to analyse the interactions of farmers and traders that allow them access to resources for production and marketing and the nature of these links. The study applied a mixed method that used both qualitative and quantitative approaches. A case study method was also used due to the exploratory and inductive approach to relationships, attitudes and beliefs that were necessary for the study of trust and power. The tomato system was chosen for the case study and it focused on tomato farmers and traders working in the markets that are supplied with tomatoes from the research areas including Wenchi, Techiman and Tano Districts in the Brong Ahafo region.

In terms of data collection, semi-structured interviews, questionnaires, structured interviews, participatory methods and observation were used. Longitudinal design was used to collect price data on 60 farmers in two villages over three months. Similar longitudinal studies were carried out in Kumasi and Sunyani markets. Markets selected for detailed study ranged from small periodic village markets to larger urban markets according to their relative importance as marketing centres for the farmers interviewed in the villages.

Data collection was done in two phases. Thirteen villages were covered in the first phase while in the second phase intensive data was collected from three villages. The villages were selected from the three districts. Farmers were selected by stratified sampling method. In the absence of a list of names of individuals as a sampling frame, stratifications based on

areas of the village and outlying settlements identified on sketch maps where, with the use of random numbers, houses located along a straight line were picked.

Descriptive statistics such as frequencies and means were employed to describe variables and relationships. The study observed that both farmers and traders considered customer relations very important since they can benefit from having guaranteed buyers or sellers. The study found that this, however, does not directly guarantee higher prices for tomato farmers since prices received by farmers were found to be linked to the supply conditions and the bargaining power of each party.

The study concluded that market relationships in the form of networks and links are vital for providing access to market information and finance for the continual production and supply of tomatoes to urban markets. Issues of trust and power in the social relations and networks were also found to influence access to informal credit and information. This confirms the argument that good relationship between farmers and traders improves efficiency of production and marketing.

Foundjem-Tita et al. (2012) studied the relationship between producer groups and traders in non-timber forest products value chains in Cameroon. The main objective of this study was to determine how Cameroonian farmers and traders can initiate and maintain long-term relationships. A multi-stage stratified random sampling method was used with the sampling frame made up of 223 farmers and 37 traders who had been involved in buyer-seller relationships for five years.

As a first stage, two farmer groups were chosen by the Farmer Enterprise Development project based on the abundance of the two selected species of kola nuts and njansang in the study area where they were located and the desire of the members to market the selected products as a group. The second stage was the targeting of members of kola and njansang marketing sub groups within the two selected farmer groups spread over six different villages in the North West and Centre Regions of Cameroon. The traders were members of a network of traders in urban markets dealing with kola nuts and njansang and had been trading with members of the two farmer groups. The third stage consisted of the random selection of a sample of 54 farmers and 17 traders from the sampling frame for interview.

The study used a longitudinal design and gathered qualitative data through focus group discussions five years earlier and compared with both qualitative and quantitative data gathered at a second point in time by means of a survey. Data on levels of trust, commitment and dependency were collected using a five point Likert scale. The data was processed to analyse producers' and traders' perception of trust, commitment and dependence as prerequisites to the sustainability of their on-going relationships. Analyses focused on descriptive statistics such as percentages as well as a Mann Whitney U test to compare if the opinion of farmers or traders differed significantly from each other for each of the items used.

The study observed that more than half of the farmers and traders were either dissatisfied or very dissatisfied with the relationship five years after they engaged in the partnership. Moreover, it came out that more than half of the

farmers and traders do not trust one another on their trading practices in the exchange relationship, which might lead to higher transaction costs for both farmers and traders. In spite of this, both the farmers and traders were committed to continue the exchange relationship. The importance farmers and traders place on market relationships had earlier been confirmed by Lyon (2000). This study emphasised that the commitment of farmers and traders to continue the relationship was not related to relationship satisfaction and trust but it was rather based on other strategic reasons like reducing transaction costs that was common in uncoordinated transaction.

Sahara et al. (2013) studied the farmer-buyer relationship from a different viewpoint by focusing on the farmers' perspective. The study examined the relationship between chili farmers and their buyers with the objective of analysing how chili farmers in Indonesia differ in their perception of relationship quality with their buyers. The cross-sectional approach was used for the study. To capture adequate number of farmers involved in traditional and supermarket trading of their produce, the survey collected two samples. One sample comprised of 96 farmers selling to the supermarkets whose lists were provided by supermarket traders while the other group was selected through a multi-stage random sampling procedure.

First, three districts were purposively selected based on their high production of chili and the engagement of farmers in the supermarket channel. Then, 11 sub-districts and three villages in each sub-district were selected randomly. Finally, 12 chili farmers were drawn randomly in each of the

villages from lists of farmers who planted over the last year as respondents and classified into traditional channel group and supermarket channel group.

Structured interview schedules were used to collect both quantitative and qualitative data covering household characteristics, assets, agricultural land, chili production, input costs, chili marketing, and changes in chili production and marketing arrangements over the last five years. In addition, farmers' perceptions of and experience with modern channels, cash income activities and perception on relationship and price satisfaction with their buyers were obtained through a five-point Likert scale.

Statistical analyses were applied to the data by first using a hierarchical cluster procedure that utilised the 'Ward's hierarchical clustering' method and four main clusters of farmers were identified. The results were combined with Calinski and Harabasz pseudo F value and set into k-means cluster analysis to obtain the final cluster solution. The clusters were further characterised by incorporating price satisfaction dimensions and socio-economic attributes in the analysis. In addition, the ANOVA test was applied to investigate the heterogeneity among the four-group clusters. The study then used a Tukey's honestly significant differences test to examine further significant differences across the clusters.

The study observed differences in the perception of the various clusters of farmers regarding relationship quality, price satisfaction and chili production characteristics. However, relationship quality was not found to be determined by household characteristics. The study revealed that the majority of farmers were dissatisfied with prices offered by buyers. Moreover, the

study found that a cluster of farmers who had the least experience in chili farming had the highest level of satisfaction in contrast with the cluster that had the most experience in producing chilies and yet had the least level of satisfaction. This supported the earlier findings of Foundjem-Tita et al. (2012) that majority of farmers who have had as long as five years partnership with traders were either dissatisfied or very dissatisfied with the relationship.

The findings were also in line with Batt (2003) who indicated that the longer the duration of relationship with the buyers, the lower the farmers' trust level with the buyers. It was explained that in situations where the farmers became more and more familiar with their buyers, the farmers' experience suggested that the more the buyers would take advantage of them. The study concluded that the differences in farmers' perception of relationship quality with their buyers across the clusters point to the need for targeted strategies in order to enhance efficiency in the supply chain.

The second group of studies reviewed were the work of Nkendah and Nzouessin (2006), Ihle and Amikuzuno (2009), Acquah and Owusu (2012), and Lohano and Mari (2012). These studies aimed to assess the spatial integration of food produce markets with the basic premise that the analysis of spatial market integration provides an indication of competitiveness, the effectiveness of arbitrage, and the efficiency of pricing and hence the performance of food produce markets.

Nkendah and Nzouessin (2006) examined market integration of plantain in Cameroon by evaluating the extent of the transmission of the prices from the urban markets towards the peripheral markets located in the rural

areas. Spatial integration was used as an indication of the level of information circulation among actors in the food marketing channel. A longitudinal approach was applied by which monthly prices of plantain, per kilogram, collected from 10 markets over the period 1993 - 2000 by three comparable sources were analysed. These markets were selected based on the availability of data on plantain prices and the existence of actual exchange of plantain between these “rural” markets and the urban markets of Yaounde and Douala which were used as reference markets.

Data was analysed by employing descriptive and econometric methods. Descriptive statistics such as percentages were used to describe price variations and margins. In the econometric analyses, the study applied econometric time series models including vector auto-regression, autoregressive distributed lag, error correction model, and asymmetric error correction model. The results indicated that the prices at Yaounde and Douala markets were slightly co-integrated with prices at each market of production that supplied it.

The co-integration showed that the peripheral markets were integrated with Douala or Yaounde markets and that there was a causality of Granger in at least one direction and this was found to be from the reference markets. However, the two reference markets of Douala and Yaounde were found not to be co-integrated which also confirmed the observation that there were no direct plantain flows between the two markets. The study arrived at the conclusion that there was a weak integration of the production and

consumption markets as a result of poor information circulation among the various markets.

Ihle and Amikuzuno (2009) studied market integration from a slightly different perspective by assessing spatial price transmission among domestic tomato markets in Ghana. The objective was to ascertain whether spatial price transmission depended on direct trade between markets, or whether other forces determined market integration. The study was longitudinal and used both a high-frequency primary data set covering about three tomato production seasons over 18 months and a low-frequency secondary dataset covering 16 years for the five most important markets for fresh tomato. The primary data consisted of semi-weekly price and trade flow data while the secondary data comprised of monthly wholesale tomato prices for the five selected markets. The secondary price data were deflated by the consumer price indices for food obtained from the Ghana Statistical Service.

Descriptive statistics such as frequencies, means and standard deviations were used to interpret and analyse the data collected. The study also applied the vector error correction model that focused on prices and trade regimes instead of price margins and transaction costs to analyse price transmission and market integration. The analysis pointed out that there was market integration in the absence of trade flows which suggested that physical trade might not be the only mechanism playing a crucial role in market integration.

The study concluded that the integration of Ghanaian tomato markets was partly strong even in periods without direct trade flows and information

exchange among suppliers or third-market effects might offer possible explanations to this finding. This is consistent with the earlier findings by Nkendah and Nzouessin (2006) and the conclusion that the weak integration of the production and consumption markets was as a result of poor information circulation among the various markets.

In another study from Ghana, Acquah and Owusu (2012) tested the degree of spatial market integration by analysing price transmission in selected plantain markets. Three markets were selected for the study from which weekly nominal prices per 7kg of plantain collected from August 2008 to February 2010 by the Ministry of Food and Agriculture were utilised. The selection of Accra, Kumasi and Techiman markets was based on the availability of data, geographical location of markets and levels of production of plantain.

The study analysed co-integration by first testing the price series for stationarity with the use of the augmented Dicky-Fuller test. Having established that the price series had a unit root and therefore non-stationary, the study continued to apply the Johansen's co-integration test to examine the degree of spatial market integration. Finally, the vector error correction modelling was applied to the wholesale prices to analyse the transmission among the selected markets. Study results revealed that the plantain markets in Techiman, Accra and Kumasi were co-integrated and concluded that the markets might be efficient since market integration could be used as a measure of market efficiency.

Lohano and Mari (2012) examined market integration by comparing the degree of spatial market integration between tomato and onion, two vegetables of different levels of perishability. Secondary data comprising monthly wholesale prices, per 40 kilogramme, of tomato for the period from January 1988 to June 2010, and onion for the period from July 1981 to June 2010 collected from four regional markets in Pakistan were utilised. The nominal prices of tomato and onion were deflated into real prices with the use of monthly wholesale price index.

The study applied the augmented Dickey-Fuller test of unit root to check the stationarity of the wholesale real price series of tomato and onion for each region. The unit root test showed that the price series were stationary and represented autoregressive model for each region. Error correction model was also used to estimate spatial price relationship between regions in the presence of stationarity for tomato and onion.

To compare the degree of spatial integration between tomato and onion markets, the deviation from perfect spatial integration was calculated as the absolute value of the difference between 1 and the estimated value of the market integration parameter. The average value of this deviation was computed for each of tomato and onion markets and the degree of integration compared between them. The results indicated that the wholesale real prices of tomato and onion were spatially integrated, however, the overall degree of integration in onion markets is 80 percent and therefore relatively stronger than 75 percent in tomato markets. The study concluded that the difference

might be attributed to the relatively lower degree of perishability in onion as compared to tomato.

A third group of reviewed studies were those by Suleiman (2001), Mostofa, Karim and Miah (2010), Kuwornu, Izideen and Osei-Asare (2011), and Conteh, Yan and Gborie (2014). The studies analysed smallholder farmers' response to prices and other related factors based on the underlying proposition that higher produce prices are incentives to improve production and supply.

Suleiman (2001) studied the responsiveness of peasant farmers to changes in price and non-price factors in Ethiopia. Longitudinal design was used by employing data from a nation-wide Ethiopian Rural Household Survey which was undertaken during 1994-2000 in 15 villages from which 1154 households were selected randomly. Suleiman's (2001) study applied the farm-level data in quadratic production and restricted profit functions to estimate the elasticities of price and non-price variables. The price variables included output prices, fertilizer prices and wage rate while the non-price variables comprised of area cultivated, animal power and farm capital. Others were land quality, land access, road density and rainfall.

The study found out that even though farmers responded to price incentives, the effect of prices on output supply and fertilizer demand was negligible. The finding also indicated that non-price factors affected production and resource use more strongly than price incentives. The study therefore concluded that getting prices right was not enough but also important

was the need to put in place effective policies to enhance accessibility of farmers to land, credit, public investment in roads and irrigation.

Mostofa et al. (2010) approached the study of supply response by assessing the effect of price factors on the acreage response of some winter vegetables in Bangladesh. Using a longitudinal design, the research employed time series data comprising of farm gate price, yield and area under cauliflower, cabbage, tomato and radish for the period 1972/73 to 2005/06. The study considered farm gate prices to be more reflective of what farmers receive from the sale of their produce than market prices. The study used variables such as lagged area, lagged relative price and lagged relative yield because it assumed that the area under the various winter vegetables in a particular year was likely to be influenced by these variables.

In addition, risks resulting from variations in yield and price were expected to act as limiting factors on acreage under the vegetables in a particular year and hence relative price risk and relative yield risk were also used as risk variables. The risk factors were computed as the coefficient of variations of prices and yield of the various vegetables for the preceding two years since this appeared to be the longest period farmers could recollect with reasonable accuracy. The study employed the Nerlovian partial adjustment lag model (Nerlove, 1956). The results of the regression analysis revealed that lagged relative prices had significant positive impact on area under cauliflower, radish and tomato. The study concluded that farmers considered the changes in relative prices of cauliflower, radish and tomato in allocating

area under these vegetables confirming that higher produce prices are incentives to improve production and supply.

Kuwornu, et al. (2011) analysed the responsiveness of rice production to price and non-price factors over the period 1970-2008 in Ghana. Using a longitudinal design, the research utilised annual time series data of aggregate output, total land area cultivated, yield, real prices of rice and maize, and rainfall for the analysis. The time series were tested for stationarity using the augmented Dickey-Fuller test. With the exception of rainfall that was stationary at 5% significance level, all the time series were found to be non-stationary but stationary after first differencing at one percent significance.

The Johansen maximum likelihood criterion was also used to test cointegration and estimate long-run elasticities and the Granger error correction model was then applied to estimate short-run elasticities. The study conducted linear regression of time in years on acreage cultivated, aggregate output and real price of rice to determine the growth rates of the variables over the study period. Johansen co-integration test indicated that the variables were co-integrated.

The study observed that the area of land put under rice was significantly dependent on output, rainfall, real price of maize and real price of rice. Similarly, the analysis showed that aggregate rice output was dependent on area cultivated, previous year's output, and previous year's price of rice but the coefficient of maize price was not significant. The analysis also revealed that short-run responses in rice production are lower than the long-run responses, as depicted by the higher long-run elasticities. The study

concluded that farmers were unwilling to respond positively to price increases immediately due to frequent price fluctuations.

Conteh et al. (2014) assessed the acreage response of farmers to price and other related factors in rice cultivation in Sierra Leone. The research applied the longitudinal design and obtained secondary data from various sources including national government and international agencies covering the period 1980-2011. The variables used for the study were lagged yield, lagged cultivated area and lagged prices received by farmers for two varieties of rice, ROK and NERICA, as competing crops commonly cultivated in Sierra Leone. The nominal market prices were deflated by a GDP deflator to nullify the possible effect of inflation.

The study employed the Nerlovian partial adjustment supply response model and the ordinary least square (OLS) technique was used to determine the coefficients of acreage response models for the rice varieties. Area cultivated under each rice variety was used as the dependent variable while lagged prices and ratio of lagged yield of the two varieties and lagged area cultivated under the other variety were utilised as independent variables for the model for each of the two rice varieties.

The study results found out that the magnitudes of the coefficients of the lagged acreages of both ROK and NERICA were positive and highly significant which signified that farmers' adjustment rate to price was very low. The short-run price elasticities for lagged real price for both the ROK and NERICA rice varieties were lower than the long-run elasticities indicating a long term adjustment of the acreage under each variety of the crop. The study

concluded that acreage was more responsive to other factors such as institutional environment and technological challenges than price incentives. The empirical studies give an indication of the variety of methodologies applied in situations similar to this study and thus help in drawing lessons and ideas for this study.

Implications of Empirical Review and Lessons Learnt

The review has illustrated how the level of market efficiency can be affected by non-price factors in the form of relationship quality between farmers and traders and also how signals of the level of market efficiency are given by the degree of market integration using prices. In addition, the link between price incentives, together with non-price factors, and farmers' decision to produce has also been expounded by the empirical review. The variety of research designs, the results and the lessons emanating from these empirical studies have implications for this study.

With the exception of the studies on market integration for which researchers mostly used only quantitative study design, researchers of the studies reviewed applied the mixed method and employed both quantitative and qualitative study designs. There were varied sampling procedures used by the various studies. The studies on relationship quality and supply response which made use of the mixed method study design mostly employed the multi-stage stratified sampling method to ensure representativeness of all relevant sections of the study populations. However, the studies on market integration reviewed did not use any sampling method because they relied solely on secondary data.

In the case of the studies on relationship quality, Lyon (2000) used the case study method to examine relationships, attitudes and beliefs in the study of trust and power. Foundjem-Tita et al. (2012) compared qualitative data collected from the same respondents five years earlier with qualitative and quantitative data gathered at another point in time. Sahara et al. (2013) focused on the farmers' perspective of the quality of the farmer-buyer relationship.

According to Lyon (2000) much of the research on marketing has taken a quantitative approach by looking at prices. At best, these approaches make use of quantifiable proxy indicators in an attempt to examine social issues embedded in the economic process. Lyon (2000) contends that such approaches do not adequately capture the nature of the social relations and therefore emphasises the need for a mixed method in marketing research.

Sahara et al. (2013) note that social relations like relationship quality between farmers and traders has not received the needed attention in the literature in developing countries. Relationship quality studies are essentially interaction assessments and need to be 'two-way' in line with the nature of relationships. However, the empirical review suggests that some studies of relationship quality dwell on farmer only (Sahara et al.) or trader only perspectives due to reasons such as challenges involved in collecting and analysing data from both sides (Vieira et al., 2008). This may cast a doubt on the authenticity of results in some cases and the choice must thus be supported by clear objectives of the study with good analysis to rule out any trace of bias.

The reviewed studies on market integration mostly used single commodities or groups of identical commodities as commonly found in the literature. However, Lohano and Mari (2012) compared the degree of spatial market integration between tomato and onion in relation to their different levels of perishability. This brought out the effect of the peculiar nature of the food produce being traded. The reviewed studies generally used data collection methods comprising of questionnaire administration, interviews, focus group discussions, participatory methods and observations for both the cross-sectional and the longitudinal designs. Quantitative data collection methods were mostly employed by the studies on market integration and supply response.

The studies on relationship quality between farmers and traders, in particular, made extensive use of qualitative data collection techniques to gain insight into the quality of the relationships between farmers and traders. Data on the perceptions of both farmers and traders about the quality of their relationships were obtained through a five-point Likert scale. The review has underscored the need for marketing research to use a multi-method approach to increase both the validity and reliability of data collected and results obtained from the analyses.

The analytical techniques applied in the studies consisted of both qualitative and quantitative methods. Analyses for the studies on relationship quality between farmers and traders mostly focused on descriptive statistics such as percentages, frequencies and means to describe variables and relationships. Some applied advanced statistical analyses to the data including

analysis of variance (ANOVA) to establish relationships and a Mann Whitney U test to compare if the opinion of farmers or traders differed significantly from each other on the variables used. Following the increasingly common use of satisfaction, trust and commitment to conceptualise relationship quality in the agricultural business literature (Sahara et al., 2013), some of the studies utilised these variables to measure the level of relationship quality between farmers and traders.

In addition to descriptive statistics such as frequencies, means and standard deviations used to interpret and analyse the data collected, all studies on market integration also employed econometric methods. These included vector auto-regression, auto-regressive distributed lag, error correction model, asymmetric error correction model and Johansen's co-integration test. In cases where price series were of moderate length, the co-integration was analysed by first testing the price series for stationarity with the use of the augmented Dicky-Fuller test of unit root, as normally recommended for moderate or long time series (Menard, 2002).

Most of the studies on supply response employed the Nerlovian partial adjustment lag model (Nerlove, 1958) using the econometric techniques of either regression analysis or the ordinary least square (OLS) to determine the coefficients of acreage or yield response models for the crops being studied. Other studies also applied the quadratic production and restricted profit functions to estimate the elasticities of price and non-price variables or the co-integration method using Johansen maximum likelihood criterion to estimate

long-run elasticities. In the case of the latter, the Granger error correction model was also applied to estimate short-run elasticities.

The review has revealed that few of the studies on supply response considered risk as an important factor that affects the dynamics of agriculture. Undoubtedly, risk and uncertainty particularly of price and yield faced by farmers are higher than the average firm (Muchapondwa, 2008) and therefore affect farmers' production decisions in no small measure. Ignoring this factor in supply response analysis means the analysis does not capture the realistic production processes of the farmer.

Results from the empirical studies on relationship quality including Lyon's (2000) and Foundjem-Tita et al.'s (2012) provided evidence of the importance farmers and traders place on market relationships and linked the theory of relationship marketing to market efficiency. Further analyses from the studies indicated that the commitment to continue the relationship did not relate to relationship satisfaction nor trust but suggested that it was based on other strategic reasons like getting access to information and credit and reducing transaction costs. Sahara et al.'s (2013) study confirmed that majority of farmers had low levels of satisfaction with the farmer-trader relationship, particularly those who have been in the relationships longer.

The empirical study of Ihle and Amikuzuno (2009) on market integration demonstrated that there could be market integration even in periods without direct trade flows and suggested that information exchange might offer a possible explanation to this finding. On the reverse side, this was consistent with Nkendah and Nzouessin's (2006) study which found that the

weak integration of the production and consumption markets was a result of poor information circulation among the various markets. Studies of Acquah and Owusu (2012) and Lohano and Mari (2012) also showed evidence of co-integration of plantain markets in Ghana and tomato and onion markets in Pakistan and concluded that the markets might be efficient.

Empirical studies of Suleiman, 2001, Mostofa et al. (2010), Kuwornu et al. (2011) and Conteh et al. (2014) which focused on farmers' supply response to price and non-price factors all produced evidence that farmers responded to price incentives, albeit slowly. This is a confirmation that higher produce prices were incentives to improve production and supply. The result also indicated that non-price factors affected production and resource use more strongly than price incentives.

In summary, the reviewed studies have separately assessed the quality of farmer-trader relationships, the spatial integration of food produce markets and farmers' supply response to price and non-price factors. However, the studies have not traced the linkages among these interrelated processes involving food produce farmers and the effect these could have on agricultural growth. An integrated approach to understanding both the behavioural and economic aspects of the food produce market and how price signals that farmers receive inform their production decisions may be required. The reviewed literature and the lessons learnt have informed the construction of the conceptual framework for the thesis.

Conceptual Framework of Food Produce Marketing and Agricultural Growth

The conceptual framework in Figure 3 depicts the relationship between food produce marketing and agricultural growth. A number of concepts and factors, as identified from the theoretical and empirical reviews, come into play in this relationship. The key concepts include market efficiency, relationship quality, household production optimisation decision and food produce market. Others are resources, activities, food production and poverty reduction. In addition, variables identified are trust, commitment, satisfaction, price and information. The remaining includes credit, land, labour, and capital. These factors could have positive or negative effects and increase market efficiency and promote agricultural growth or decrease market efficiency and retard agricultural growth.

The framework attempts to illustrate the point that both behavioural and economic factors affect the efficiency of the food produce market. In essence, better relationship quality between farmers and traders engenders higher efficiency of the food produce market. Similarly, well-integrated food produce markets where there is free flow of information and food produce promote market efficiency. The framework shows that market efficiency translates into prices that serve as incentives for farmers to increase food production and agricultural growth towards poverty reduction.

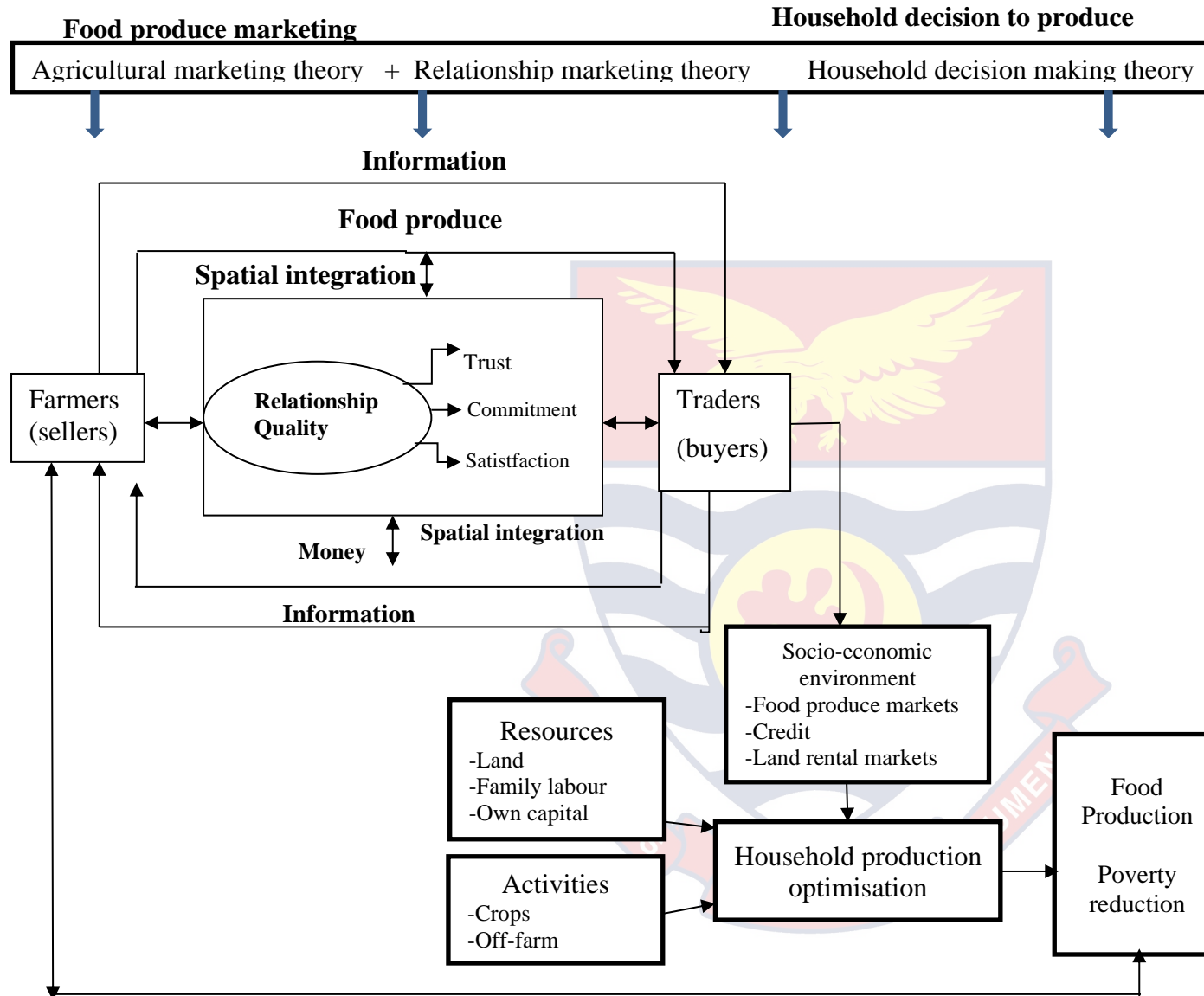


Figure 3: Conceptual Framework of Food Produce Marketing and Agricultural Growth

Source: Adapted from Vieira et al. (2008); Laborte et al. (2009) and Kotler and Keller (2011)

The framework (Figure 3) has been adapted from three different sources capturing ideas for the main aspects of the thesis. One aspect adapted from Kotler and Keller's (2011) simple marketing system which depicts the relationship between sellers or farmers and buyers or traders, indicate that sellers and buyers are connected by four flows. The simple marketing system was basically adopted with the exception of changing some labels to make them particularly relevant to the study. The labels "Industry", "Goods/Services" and "Market" were changed to "Farmers", "Food Produce" and "Traders" respectively.

In Figure 3, the inner loop shows an exchange of money for food produce while the outer loop shows an exchange of information between farmers and traders. Information exchange generates spatial market integration (Ihle & Amikuzuno, 2009; Nkendah & Nzouessin, 2006) which also is a measure of market efficiency (Acquah & Owusu, 2012).

Figure 3 also shows a box representing relationship quality embedded in the marketing system. The relationship quality aspect has been adapted from Vieira et al. (2008) using the core model of relationship quality without its key determinants and focuses on the behaviour of farmers and traders as market channel members. The key dimensions of relationship quality include trust, commitment and satisfaction which, when are at acceptable levels, enable both farmers and traders to reduce transaction costs and enhance spatial market integration and market efficiency (Foundjem-Tita et al. 2012).

Other factors which are significant in food crop farmers' response to signals from the market towards improving food production have been

represented in the boxes linked to the marketing system. This aspect of the conceptual framework is adapted from Laborte et al. (2009). It highlights the social and market constraints that affect agricultural household decision behaviour as against focusing on all the constraints indicated in Laborte et al.'s framework which include natural and technological factors. Households decide to make use of resources such as land, labour and capital to undertake farm or off-farm activities under the influence of the socio-economic environment (Enete & Amusa, 2010). This is done with the aim to maximise outputs in the form of food production and poverty reduction (Tiberti & Tiberti, 2015).

The socio-economic environment comprising markets such as food produce, credit and land could affect the decision of farm households concerning the production and marketing of food produce. In particular, when the food produce market is efficient and generates favourable prices, farm households are likely to decide to invest more resources to increase food production and reduce poverty (Thirtle et al., 2001). The premise behind the framework is that prices have great influence on the pace and direction of agricultural growth (Nuhu et al., 2009).

Another aspect of the conceptual framework is the bar above the boxes with arrows pointing downwards. In the bar are indicated the major theories that inform the various aspects of the framework and are positioned to correspond to the aspect a particular theory influences. Thus, on the left-hand is a combination of agricultural marketing and relationship marketing theories which inform the marketing aspect while the household decision making

theory, on the right-hand, also underpins the decision of food produce farmers to increase production towards poverty reduction and agricultural growth.

It is observable from the framework that all the concepts and variables are linked. They show coordination and interdependence that give credence to the relationship between food produce marketing and agricultural growth. Both the economic and behavioural aspects of food produce marketing combine to generate market efficiency that stimulates agricultural growth. Thus the framework well captures the essential relationships among the various variables and indicators.

Conclusion

The chapter has reviewed the theoretical and empirical issues in the study of food produce marketing and agricultural growth. The review of the theories was for the purpose of situating the discussion in the proper historical and thematic context to obtain clarity on the mechanisms of food produce marketing and the resultant agricultural growth. Review of the empirical literature confirmed, to a large extent, a number of the assumptions held in relationship marketing, spatial market integration and supply response to both price and non-price factors. Subsequently, a conceptual framework that captures the intricate relationships among the various concepts and variables drawn from the theories has been constructed to aid analysis.

CHAPTER FOUR

METHODOLOGY

Introduction

The focus of this chapter is the research methodology which has been defined as “the general approach the researcher takes in carrying out the research project” (Williams, 2007, p. 66). Kumar (2011) describes research methodology as the path to finding answers to research questions. It constitutes a sequence of steps which Kumar broadly categorises under planning (including conceptualising a research design) and conducting a research study (including collecting, processing and displaying data) after having formulated the research problem. Research methodology therefore serves as a guide to how fieldwork is undertaken and helps in solving the problem systematically and to best achieve the research objectives (Pavan & Kulkarni, 2014).

This chapter explains the methodology used in this study to answer the research questions and draw lessons from the reviewed empirical studies. The chapter begins with a presentation of the research design and the study design. It also describes the study area and the study population and sampling processes, sources of data, research instruments, methods of data collection and data analysis used for the study.

Research Design

Research design is the basic plan or framework for conducting the study. It involves four main ideas which are the strategy, conceptual framework, who and what to be studied and the tools and procedures to be

used for collecting and analysing empirical materials (Punch, 2009; Smith & Albaum, 2012). A critical aspect of the design is the logic or paradigm within which to locate the study for valid general conclusions to be drawn (Schutt, 2012). The paradigms that underpin social science research are mainly the positivist or objectivist, subjectivist or interpretivist and the pragmatist.

According to Johnson and Onwiegubzie (2004), the positivist philosophy assumes that there is a concrete and objective reality that scientific methods help to reveal. Thus, it integrates the norms and practices of physical science and considers social reality as an external objective reality that is beyond the influence of the individual and applies quantitative method to investigate social phenomena such as food produce marketing efficiency. The positivist approach applies a deductive approach to research, starting with a theory and testing of theoretical assumptions using empirical data (Bhattacharjee, 2012; Williams, 2007).

The analysis of quantitative data such as food produce price series allows interpretations and findings to be based on measurable information through statistical procedures which makes it possible for generalisation of findings to be made about the efficiency of the food produce market. Methodologically, a key demerit identified with the positivist philosophy is the relative inflexibility of quantitative tools which cannot be used in exploring answers for in-depth knowledge and understanding of the social system the food produce market is embedded in, as pertains in this study.

In contrast, the subjectivist, also called interpretivist or constructivist philosophy assumes that social realities are situational and cannot be

understood outside their contexts (Creswell, 1998). It dwells on inductive rather than deductive reasoning, whereby the discovery of knowledge occurs in a natural setting with high involvement of the researcher in the actual experiences (Williams, 2007). This means that the discovery of in-depth knowledge of the relationship between food crop farmers and their traders, as in this study, happens through the direct interview, discussions and observation by the researcher with the farmers and the traders. Thus, the subjectivist paradigm employs an inductive approach that starts with data and attempts to derive a theory about social phenomenon from observed data (Morgan, 2013).

The interpretivist philosophy relies heavily on qualitative research approach to get deep understanding of people's interpretations, understandings and/or misunderstandings of the social reality (Johnson & Onwieguzie, 2004). One key attribute on which qualitative research builds its premises is that social phenomenon like relationship quality in food produce marketing in this study, is investigated from the viewpoint of farmers and the traders to ensure objectivity and truth (Schutt, 2012). A concern about the interpretivist philosophy is that its ontological view tends to be subjective rather than objective and that research outcomes are affected by the researcher's own interpretation and belief system which causes bias (Pham, 2018).

A third and most recent paradigm that underpins social science research is the pragmatist philosophy. Bhattacharjee (2012) argues that pragmatism treats research as a human experience that is based on the beliefs and actions of actual researchers. In this wise, as Morgan (2013) and Shannon-

Baker (2015) observe, pragmatism is outcome-oriented and interested in determining the meaning of things. Shannon-Baker further indicates that pragmatism assumes that theories can be both contextual and generalisable and believes in complementarity in the sense that one can maintain both subjectivity in one's own reflections on research and objectivity in data collection and analysis.

A challenge identified in the use of pragmatism is maintaining the integrity of the single study, without allowing the research to decompose into two or more parallel studies (Smith & Albaum, 2012; Yin, 2006). However, Brierley (2017) maintains that pragmatism provides a middle position both methodologically and philosophically by offering a mix of quantitative and qualitative methods to answer research questions. Thus it provides an alternative that brings together both the positivist and constructivist paradigms along to find answers to research questions.

Consequently, a research design for social studies may be generally classified into exploratory, also known as descriptive, and conclusive also referred to as causal approach (Williams, 2007). Denscombe (2010) and Bhattacharjee (2012) note that research designs should be chosen to best fit a research problem and this study principally used the descriptive and cross-sectional approaches. The descriptive approach was relevant for this study because the study aimed to determine the implications of food produce marketing on agricultural growth by measuring not only the quantitative aspect of market efficiency but by describing the behavioural aspect as well and how farmers use market signals to make food production decisions.

The study sought to delve into the nuances of the quality of the relationship between food crop farmers and traders which could be better described in words. In addition, understanding how agricultural households make decisions to produce food crops at the level they did also required the use of quantitative data as well as qualitative data. In such situations where there are multifaceted phenomena, writers including Smith and Albaum (2012) and Shannon-Baker (2015) suggest the application of multi-method approaches. This may help reinforce the unique strengths of each research method and produce insights that may not be obtained by using a single method (Brierley, 2017).

Furthermore, Johnson and Onwieguzie (2004) argue that there is the need to complement one method with another to be able to conduct more effective research especially as the research world is becoming increasingly inter-disciplinary and complex. Hence, the use of mixed methods has become common for a holistic and more complete understanding of social phenomena. Kumar (2011) and Antwi and Kasim (2015) emphasise that the exact mixture of the methods that is considered appropriate will depend on the research questions and the situational and practical issues facing a researcher.

Study Design

This study relied on the descriptive and cross-sectional survey approaches using both quantitative and qualitative research methods. The mixed methods have been applied in agricultural marketing and production studies by researchers such as Lyon (2000), Foundjem-Tita et al. (2012) and Sahara et al. (2013) in order to understand the multiple realities in the

relationship that exists between food crop farmers and traders as market channel members in food produce marketing and how farmers' production decisions are informed by price and non-price signals.

The cross-sectional design is a survey strategy of inquiry associated with the quantitative approach of research. It collects data by questionnaires or structured interviews on two or more cases at a single point in time so as to collect a body of quantitative or quantifiable data on two or more variables which helps to identify their patterns of association (Sarantakos, 2005). Cross-sectional design makes it possible for the generalisation of findings to be made from samples of smallholder farmers to populations or large numbers of smallholder farmers (Bryman, 2008; Punch, 2009).

Moreover, as a survey research method, the cross-sectional design is particularly suited for this study in a number of ways. For instance, as Yin (2009), Tuli (2010) and Creswell (2013) note, a survey could be used to provide answers when the purpose of a research is to know the “what” outcomes of a policy intervention or a stimulus. The purpose of this study was to find out the outcome or the decisions smallholder farmers make in response to the signals that the food produce market gave them and the implications these decisions have for agricultural growth. The survey research method enabled the study of the problem of how food produce marketing impacts on agricultural growth from multiple perspectives or using multiple theories such as agricultural marketing theory, relationship marketing theory and household decision making theory.

The cross-sectional design is markedly different from the experimental design, which controls or manipulates independent variables and measures these variables and tests their effects using statistical methods (Bryman, 2008). According to Denscombe (2010), the cross-sectional design is weak in attributing causality because of its non-temporal nature, unlike most experimental designs. Surveys in general may be subject to respondent biases such as receiving “socially desirable” responses rather than their true response which further weakens internal validity or the causality quality (Bhattacharjee, 2012).

The longitudinal research design, as a survey research method, was considered suitable for one aspect of this study because the design is scientifically valid (Enu-Kwesi, 2005; Yin, 2009). The longitudinal survey design measures variables or features of people over a longer period which makes it costly, in terms of time and money. Therefore, for this study, being a student research and therefore time-bound it was found useful only in the situation where secondary data comprising of price series were needed. Both Enu-Kwesi and Creswell (2013) agree that the cross-sectional survey is the simplest and most suitable for student research due to the least cost and the shorter data collection process involved.

Study Area

The study was conducted in Techiman Municipality, now in Bono East Region and Asutifi South District and Tano North District, both now in Ahafo Region (Figure 4). Until February 2019, all the three districts were part of the Brong Ahafo Region which was the second largest region in Ghana with a

land area of 39,558 km². It shared boundaries with Western Region and Ashanti Region on the southern side, Volta Region to the east, Northern Region to the north and La Cote d'Ivoire to the west. Figure 4 is a map of the then Brong Ahafo Region showing the districts and the study areas.

The Techiman Municipality has a population of 147,788, according to the 2010 Population and Housing Census by Ghana Statistical Service (GSS). The municipality is predominantly urban with 64.3 percent of the population living in the urban areas and 35.7 percent being rural dwellers (GSS, 2014a).

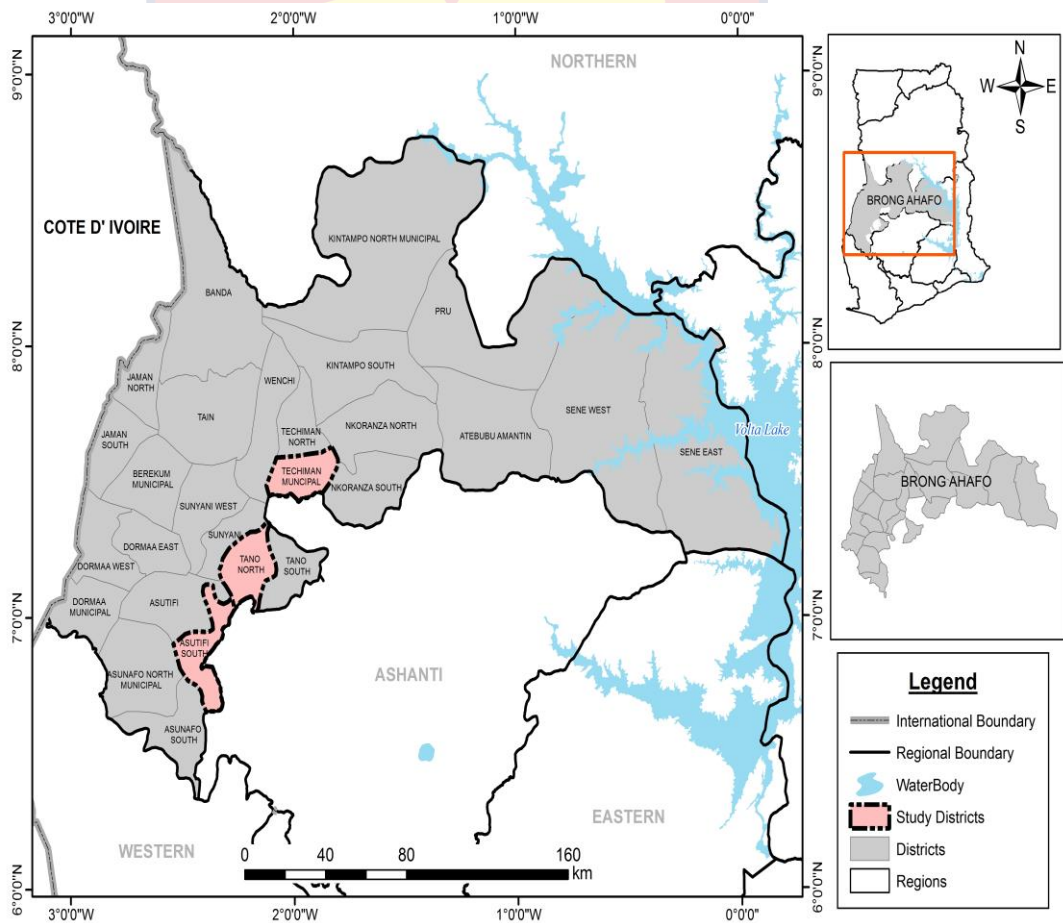


Figure 4: Map of districts in the then Brong Ahafo Region showing study area

The municipality lies across three main vegetation zones, namely, the guinea-savanna woodland, the semi-deciduous zone and the transitional zone (GSS, 2014a) which enables the inhabitants to cultivate a range of agricultural produce. According to GSS, agriculture is the main economic activity in the municipality, employing 36 percent of the economically active population. The key agricultural activity is crop farming which engages 95.4 percent of households in the municipality. The major crops grown are food crops such as yam, potato, maize, cassava, cocoyam and plantain as well as vegetables including tomato, garden egg, onion and okro. Agriculture is mainly rain-fed in the municipality with irrigation facilities provided in a few areas such as Tanoso where tomato and other vegetables are predominantly produced.

Techiman serves as points of exchange of goods and services as well as an important influence on the economic life of the surrounding communities. Techiman is noted for having one of the largest agricultural produce markets in the country and in West Africa (GSS, 2014a). The Techiman market, which can also be classified as international, attracts traders from all over the sub-region like Mali, Burkina Faso, Nigeria and Niger. Furthermore, Techiman has two important agro-processing factories which use raw materials from the locality and provide regular employment to a number of people. These are the Tomato Processing Promotion Centre and the Ghana Nuts Company (Robinson & Kolavalli, 2010c).

The Asutifi South District is a rural and an agrarian district. It has a population size of about 53,584 of which 28,285 (53.0%) are males and 25,299 (47.0%) are females (GSS, 2014b). Out of the 20 settlements in the

district, only four are urban centres while the rest are rural. The district has semi-deciduous forest with patches of savanna transitional vegetation and soils that are suitable for the cultivation of crops such as plantain, cassava, oil palm, maize, and cocoyam as well as vegetables including tomato, garden eggs, okro, pepper, and ginger (ASDA, 2013). It exports food produce to major marketing centers like Goaso and Sunyani in the Brong Ahafo Region and Kumasi, the Ashanti Regional capital. The district is also noted for gold mining which has attracted a lot of small scale miners and the attendant influence on the socio-economic life of the district.

Tano North District has a population of 79,973 comprising 39,593 males and 40,380 females. The district has almost equal proportions of the population living in urban and rural areas (GSS, 2014c). The district lies in the forest zone and has a vast area of arable land with fertile soils that support the cultivation of a wide range of crops. Agriculture is therefore the predominant occupation employing 67.1 percent of the total active work force (GSS). The major food crops grown in the district are maize, cassava, plantain, cocoyam and yam and vegetables such as tomato, garden egg, okro and pepper grown in large quantities during the dry season (TNDA, 2016). Tano North District is also a gold mining area and therefore has had an influx of migrants from both within and outside the region.

The study districts fall in guinea-savanna woodland and semi-deciduous forest vegetation zones in the Brong Ahafo Region which, coupled with a double maxima rainfall pattern that supports two cropping seasons, enable the cultivation of many food crops. Consequently, the region is an

emerging food basket in Ghana where improvement in agricultural technology has provided higher than average yields per hectare (Songsore, 2010). The region has gained popularity for the production of major food crops in the country. For instance, it is the largest producer for tomato, maize and yam and the second largest producing region for plantain and cassava (Dzomeku et al., 2011; MoFA, 2016).

Food crop production has significant socio-economic importance in the region as a primary source of food and income, particularly plantain (Dzomeku et al., 2011). Similarly, vegetable production is an important economic activity for both rural and urban dwellers in the region. Among the vegetables produced in the region, tomato is the most popular being used in every home with a high per capita consumption and serving as a food security crop (Anang, Zulkarnain & Yusif, 2013). Thus, food production has a huge potential for poverty reduction for more than two-thirds of households in the region who are engaged in it (GSS, 2013).

Food crop production in the region is subsistent in nature with more than 90% of the cultivated area belonging to smallholder farmers, like the rest of Ghana (Dzomeku et al., 2011). The food crop sector is characterised with the dominance of rainfed agriculture which engenders production seasonality. Moreover, there is high perishability of the produce, limited storage facilities and poor market access which have resulted in low average yields and seasonal gluts of food produce, especially tomato (Ngeleza & Robinson, 2011) and plantain (Dzomeku et al.).

The cultivation of tomato is a major farming activity in the savanna and forest-savanna transitional zones in the Brong Ahafo Region and in other parts of Ghana (Adu-Dapaah & Opong-Konadu, 2002). According to Robinson and Kolavalli (2010b), tomato farming in the region can be described as low input-high yield because farmers typically use minimal or no irrigation and little improved varieties. Even though the local varieties yield higher than some improved varieties, most farmers' yields are well below ten tons per hectare as compared to the achievable yield under rain-fed conditions of 15 tons per hectare (Robinson & Kolavalli).

There is limited processing of farmers' tomato despite the fact that the region has two tomato factories, one located at Wenchi and the other at Techiman (Robinson & Kolavalli, 2010c). Even though the potential of the sector is yet to be exploited fully, it has been observed that tomato farmers in the region, as compared to farmers in other tomato producing regions in Ghana, appear to get better prices (Robinson & Kolavalli, 2010a). This observation further points to the potential of the tomato sector for poverty reduction when marketing is improved.

The region, being the second largest producer of plantain in Ghana after Ashanti Region, has a large population of participants in the production and marketing of plantain. According to Dzomeku et al. (2011), 113,000 households are engaged in plantain cultivation and producing a share of 27 per cent of the national production. Plantain therefore contributes to a large extent to poverty reduction and the socio-economic development of the region. However, marketing of plantain has not received as much attention as is given

to the production and therefore the plantain sector is faced with many marketing problems which in turn determine the extent to which production can be expanded (Mensah-Bonsu et al., 2011). The key marketing problems are low price for the produce and the buyers dictating the price (Dzomeku et al.).

The examination of the contribution that marketing make to the growth of food production would be done in the Brong Ahafo Region of Ghana which is well noted for having a good blend of staple crop and vegetable productions and could thus help provide a good insight into the production and marketing situation of food crops in the region. The researcher is also familiar with the widely spoken local language in the area.

Study Population

The study population comprised the key actors in the production and marketing of plantain and tomato in the study area made up of Techiman Municipality, Asutifi South and Tano North Districts. The population included plantain and tomato farmers and traders. In the three study districts, the number of plantain and tomato farmers was estimated at 16,130 while the number of traders in plantain and tomato was also estimated at 6,052 yielding a total of 22,182 (MoFA, 2012). The farmers were mainly smallholder farmers but the traders comprised both wholesalers and retailers. The farmers and the traders were located in both rural and urban areas. Primary data collection focused on smallholder farmers and traders.

It was recognised that some aspects of the data could be directly verified from actors who render services in the production and marketing of

plantain and tomato. Examples of this category of actors are transporters, Agricultural Extension Officers of MoFA and District Assembly officials. Although these actors play important roles in facilitating the production and marketing of food produce, they were not considered as part of the primary population.

Sample and Sampling Procedure

Efforts were made to ensure that representativeness of the sample was achieved in order to allow for valid conclusions to be drawn about the research population. The study therefore applied multi sampling techniques including purposive, stratified and systematic random sampling techniques. The sample size from the total population of 22,182 participants was determined through the use of the table of sample size determination developed by Krejcie and Morgan (1970) (as cited in Sarantakos, 2005). The table indicated an initial sample size of 386 participants (Appendix A), at a confidence level of 95 percent and a margin of error of five percent. The sample size of the study of 386 was allocated proportionally and therefore comprised 286 farmers and 100 traders.

Multi sampling methods were used to ensure that all the various categories of the participants were fairly represented. Out of the 27 districts in the Brong Ahafo Region, three districts were purposively selected based on two key criteria. One criterion was high production of plantain or tomato, according to information provided by MoFA regional office and the other was rural-urban representation. This ensured that one rural district, one semi-rural district and one municipality were selected from areas in the region where

plantain and tomato farmers and traders who had the relevant information for the study were concentrated (Schutt, 2012). The selected study districts of Asutifi South District, Tano North District and Techiman Municipality were rural, semi-rural and urban districts respectively.

After this selection, the stratified sampling method was applied by first, classifying the population into farmers and traders and then into categories of the type of food crop produced and traded in each selected district. Stratification was introduced into the selection process in order to ensure that essential parts of the population were appropriately represented in the overall sample (Denscombe, 2010). It allows for the selection of a sample which will likely include, in this case, an appropriate balance of tomato and plantain farmers within the sample.

Subsequently, the allocation of the sample size of 386 to the various categories or strata was done proportionally according to the proportion each stratum forms of the research population. Therefore, sample sizes across the three districts of 192 for plantain farmers, 94 for tomato farmers, 66 for plantain traders and 34 for tomato traders were arrived at. The sample sizes per district were 148, 114 and 124 for Asutifi South, Tano North and Techiman districts respectively. Table 1 shows the sampling allocations.

Table 1: Sampling Allocation to Categories of Respondents

District	No. of Farmers			No. of Traders			Grand Total
	Plantain	Tomato	Total	Plantain	Tomato	Total	
Asutifi South	80	38	118	20	10	30	148
Tano North	56	28	84	20	10	30	114
Techiman Municipality	56	28	84	26	14	40	124
Total	192	94	286	66	34	100	386

Source: Field survey (2016)

However, challenges experienced in the field especially at the markets where some market women were too busy selling their wares to stop and provide the responses to the survey questions reduced the sample size from 386 to 348. Table 2 shows the number of respondents for each category.

Table 2: Actual Respondents per Category in Three Districts

District	No. of Farmers			No. of Traders			Grand Total
	Plantain	Tomato	Total	Plantain	Tomato	Total	
Asutifi South	80	32	112	17	8	25	137
Tano North	52	28	80	18	10	28	108
Techiman Municipal	52	25	77	16	10	26	103
Total	184	85	269	51	28	79	348

Source: Field survey (2016)

The next stage of the sampling process used the convenience sampling method instead of the simple random sampling method. Convenience sampling is a non-probability method which, as Schutt (2012) argues, is useful when random sampling is not possible. Even though part of the study is quantitative, convenience sampling was found to be more appropriate because, by the nature of the population, there were difficulties in finding or creating a list of names of individuals as a sampling frame. Denscombe (2010) has noted that non-probability sampling can still retain the aim of generating a representative sample. In this wise, attempts were made to apply established good practice even without adhering strictly to the principles of random selection.

Thus, each settlement was divided into two using the principal street of the settlement and half of the research team took one side of the settlement. The first household head that was seen as data collectors entered the houses

was interviewed. Interviews were always carried out when respondents would be easily found at home. A similar process was used to select traders whereby only the sections of the markets where plantain and tomato traders were located were covered and the traders were approached for interviewing based on their availability. Furthermore, multi-stage sampling was applied in line with Enu-Kwesi's (2005) suggestion that the application of a combination of different sampling procedures helps to improve representativeness. Key informants comprising Ministry of Food and Agriculture officers in the three study districts were also purposively sampled for data collection.

Data Collection

The selection of methods for data collection for a research is mainly informed by the type of research questions and the research strategy and every attempt should be made to obtain the most useful information to answer the critical questions (Bryman, Teevan & Bell, 2009). While certain data collection methods tend to be linked to particular research strategies, there is a range of methods that can be used for any chosen research strategy (Denscombe, 2010). However, the quantitative and qualitative methods, which refer to the type of data being collected and analysed, remain the two main methods to choose from when conducting a research in social science (Bhattacharjee, 2012). Both quantitative and qualitative data were collected for this study to enable the multiple perspectives of farmers and traders to be analysed.

Quantitative data denote data that can be described numerically in terms of objects, variables, and their values which enable evidence to be

presented in quantitative form (Hox & Boeijs, 2005; Tuli, 2010). Quantitative data were collected in order to address some study objectives which included analysing how food produce markets are integrated, and knowing the production decisions that food crop farmers make in response to price incentives. The quantitative data involved monthly wholesale real prices of tomato and the “apantu” type of plantain. The quantitative data collected covered the size of available arable land and area being cultivated, labour employed, production levels of tomato and plantain, years of farming and years of trading. Others included background characteristics of farmers and traders such as years of education, marital status, age, sex and household size.

On the other hand, qualitative data refer to data that take the form of words that are either spoken or written and visual images which may have been observed or creatively produced (Denscombe, 2010). The qualitative data collected were on how farmers and traders perceived the quality of the relationship between them based on trust, commitment, relationship satisfaction and price satisfaction. It was used to examine the price discovery process as well as how farmers made decisions to invest into food production.

The data for the study consisted of primary and secondary types. The sources of primary data were interviews with individual farmers and traders, participants of group discussions and market observations. Primary data were also obtained from staff of Ministry of Food and Agriculture as key informants. The primary data was made up of information on socio-economic background characteristics of farmers and traders, factors affecting food produce marketing, relationship between farmers and traders and production

decisions of food produce farmers. In addition, the primary data covered information on price negotiation processes observed at the market. Community and district profiles including the socio-economic characteristics of the study area were obtained from the key informants.

The secondary data sources included annual reports and databases of Ministry of Food and Agriculture, Ghana Statistical Services and Ministry of Finance and Economic Planning. These provided information on market wholesale prices of plantain and tomato, production levels of plantain and tomato, number of farmers engaged in various crops in various districts and their age distribution and consumer price indices. Such information was used to support the information collected from the field. In addition, books, journal articles and other documents were useful sources of information for the study.

Specifically, secondary data in the form of monthly wholesale nominal prices in GH¢ per 9-11 kg bunch of plantain and per 52kg box of tomato from January 2006 to December 2015 were requested and obtained from the Ministry of Food and Agriculture as indicated in Appendix H. The data covered the Techiman, Kenyasi and Duayaw Nkwanta markets which were the district markets in the study area, with the exception of Kenyasi market. Kenyasi market was used to represent the Asutifi South District because the market served as the district market for Asutifi District of which Asutifi South District was part until it was carved out in 2012 and price data continued to be jointly kept even up to 2015. The monthly wholesale nominal price data were used to analyse the spatial integration of the selected markets.

Instrument Design

Prospective respondents for the study were made up of people with varying levels of literacy and thus various instruments were used to effectively collect the needed data. Instruments that were used comprised interview schedules, interview guide, group discussion (GD) guides and an observation guide. The interview schedules were used for farmers and traders while the interview guide was used for the key informants who were MoFA staff. The GD guides were used for separate groups of farmers and traders and the observation guide was used for market observations. These instruments were used particularly because they helped in gathering qualitative data effectively and have become the most widely used data collection instruments for qualitative methodology (Tuli, 2010).

Separate interview schedules were utilised for the interviews with farmers and traders. The interview schedule for the farmers (Appendix B) comprised four sections. The first section gave attention to the socio-economic background characteristics including age, sex, marital status, level of education, number of children, size of household, and the number of years in farming. The second section focused on issues affecting food produce marketing while the third and the fourth concentrated on the relationship between farmers and traders and production decisions of food produce farmers respectively.

The interview schedule for the traders (Appendix C) consisted of three sections. The first section concentrated on the socio-economic background characteristics such as age, sex, marital status, level of education, number of

children, size of household, and the number of years in trading. The second section highlighted the issues affecting food produce marketing including availability of transportation, storage and credit facilities as well as group membership issues. The third section focused on the relationship between farmers and traders.

The interview schedules had a combination of open and closed items. The open items were to afford respondents the space to express themselves in their own words such as giving reasons to some responses relating to the relationship between farmers and traders. Closed items were to make it possible for respondents to choose from defined alternative responses or an additional category indicated as 'other' when their preferred responses were not listed. The closed items were used to collect such data as background characteristics.

The interview schedule for farmers also applied the Likert scale for the measurement of the perception that farmers have about the level of quality of the relationship between them and traders. A five-scale Likert method was used for respondents to rate their level of agreement about some pre-coded statements on commitment, trust and satisfaction on an ordinal scale of 1 to 5. The rating scale indicated 1 = very low, 2 = low, 3 = fairly high, 4 = high and 5 = very high. This follows the work of Sahara et al. (2013) in which a similar rating scale was applied in studying the farmer-buyer relationship in chilli markets.

The interview guide, shown as Appendix D, concentrated on the community or district profile. The profiles captured information on socio-

economic characteristics, weather and climatic characteristics, institutions operating in the area such as NGOs and farming activities. Others are the level of infrastructural development and availability of basic services including transport/ communication network, health centers, schools and financial institutions.

The guides for the GDs were of two types, one of which was for discussions with selected farmers (Appendix E) in each of the three districts and for both plantain and tomato making a total of six GDs for farmers. The farmers' GD guide consisted of issues affecting food produce marketing, credit facilities, farmer-trader relationship and farmer production decisions. The traders' GD guide (Appendix F) was similarly planned to be used for a total of six separate discussion groups of selected plantain and tomato traders in the three districts. The traders' GD guide comprised pattern, nature, direction of trade, price integration, profitability, farmer-trader relationship and other related issues.

Bhattacharjee (2012) indicates that a focus group discussion is useful for collecting qualitative data as it allows for deeper examination of complex issues than it is possible with the use of other forms of survey research. A focus group discussion is thus considered a more natural process for forming, developing and testing ideas (Schutt, 2012). The GD guides were prepared with the purpose of gathering relevant information to be able to appropriately address the research objectives and questions.

A market observation guide for the study (Appendix G) concentrated on three sections including market scenes which covered when and by what

means of transport market participants arrived and how the plantain and tomato were displayed. In addition, it included price negotiation to capture the verbal behaviours displayed during price negotiation and the relationship between sellers and buyers where the general communication between farmers and traders was to be observed. The observation guide had a tally where certain observed behaviours could be ticked.

Pre-Testing of Instruments

The interview schedules were pre-tested in five communities in Sunyani West District in the Brong Ahafo Region before the actual field work in order to make the research more efficient and effective. The Sunyani West District and the five communities were selected for the pre-testing due to their appreciable production of plantain and tomato and their proximity and convenience as is characteristic of pre-testing (Bhattacharjee, 2012). A sample of 42 respondents comprising 13 plantain farmers, 10 tomato farmers, 12 plantain traders and seven tomato traders were interviewed at Fiapre, Dumasua, Mantukwa, Kwabenakuma and Nsoatre which has one of the biggest markets in the district. The interview schedule for traders was tested at the Nsoatre market while that for farmers was tested in the remaining four communities.

The purpose for the pre-test was to ensure that the instruments had clear instructions, questions and statements with logical sequence (Smith & Albaum, 2012). The pre-test provided information which helped to review the interview schedules to make them more suitable for each category of respondents. The interview schedule for traders was found to be too long to fit

the time traders would normally offer for such a study and it was adjusted so that the most critical questions would be asked. A table in the interview schedule for farmers that sought details of members of the households was replaced with few questions to make it simpler. In addition, it helped to review how to gain access to respondents and improve the general receptiveness of the interview schedules. The pre-testing was conducted from 18th to 19th November, 2016.

Ethical Issues

The study considered ethical issues important at every stage to ensure that the rights of respondents are not violated as they participate in the research. According to Bryman and Bell (2011), the four key areas of ethics in research as identified by Diener and Crandall (1978) are whether there is harm to participants, whether there is lack of informed consent, whether there is invasion of privacy and whether deception is involved. Therefore, the private nature of some information that respondents were expected to provide made it necessary to consider these key ethical issues during the data collection stage. In this regard, the consent of respondents were sought before pictures were taken with the possibility of publishing them also explained to the respondents concerned.

The MoFA Regional office was first informed of the purpose of the research and the data that would be needed from the regional and district offices for which consent was sought to hold key informant interviews (KIIs) with staff. The targeted respondents were also informed of the purpose of the research and their consent sought for the specific roles they would play as

participants. Furthermore, it was explained to respondents how the data collected would be used and disposed of while assuring them of confidentiality. The importance of respect and cordiality for respondents was emphasized during the training of data collectors and as such it was the hallmark of the whole process, in accordance with the accepted courtesies of the study area.

Field Data Collection

Contacts were made with MoFA staff and Assembly members in the selected communities to have information about the appropriate days and times to do the data collection in the various communities. With this information, the schedule for the data collection was prepared and arrangements were made with the key informants in the selected districts. The Assembly members in the various communities introduced the team of data collectors to chiefs and opinion leaders in each community before interviews began. Efforts were also made to meet and introduce the research and the team to market queens for plantain and tomato at the various markets before data collection started at each market.

The team of data collectors was carefully selected to include members who were experienced in field data collection and were also fluent in the local language in order to reduce non-response and general data collection errors (Smith & Albaum, 2012). The team was made up of five research assistants among whom two had taken part in the pre-testing. Even though, the field assistants who had been part of the pre-testing were quite familiar with the

research instruments, all the team members were trained on how to use the various instruments.

The training for the team covered briefing on the research objectives, research instruments and data collection skills. In addition, the team went through mock interviews to further sharpen their skills in interpreting into the local language. This was considered to be important due to the generally low literary levels of farmers and traders. Therefore, interviews and GDs were conducted in respondents' own language, Akan, and this gave them the opportunity to fully express themselves during the face-to-face interviews.

The challenge of using open-ended items identified as time-consuming on the part of both respondents and researchers (Denscombe, 2010) was counteracted with careful training of the research assistants. The research assistants carried out the interviews of farmers and traders by administering the interview schedules and ensured that the items were explained. In particular, the rating in Likert scale were clearly explained to respondents to enable them provide their responses objectively.

The field data collection was conducted from 27th November to 30th December, 2016 in the study area as detailed in Table 3. In Tano North District, data was collected from Bomaa, Terchire and Bredi and Duayaw Nkwanta market for a period of five days (27th - 29th November, 27th and 30th December, 2016). Data collection in Techiman Municipality was conducted at Aworopataa, Tanoso, Nsonkonee and Techiman market for a period of four days (1st, 2nd, 6th and 23rd December, 2016). In Asutifi South District, data

collection was carried out at Amanfrom, Nkrankrom, Acherensua and Hwidiem market in two days (20th and 27th December, 2016).

Table 3: Itinerary for Data Collection

District	Location	Activity	Date	Person Responsible	
Tano North	Bomaa	Interviews with farmers	27 th - 28 th Nov. 2016	Researcher, Assistants	
		Plantain farmers' GD	28 th Nov., 2016	Researcher	
		Plantain traders' GD	28 th Nov., 2016	Researcher	
	Terchire	Interviews with farmers	29 th Nov., 2016	Researcher, Assistants	
		Tomato farmers' GD	29 th Nov., 2016	Researcher	
	Duayaw Nkwanta market	Bredi	Interviews with farmers	29 th Nov., 2016	Assistants
		Duayaw Nkwanta market	Tomato traders' GD	29 th Nov., 2016	Researcher
			Interviews with traders	30 th Dec., 2016	Researcher, Assistants
		Duayaw Nkwanta MoFA office	Market observation	30 th Dec., 2016	Researcher, Assistants
			MoFA staff KII	27 th Dec., 2016	Researcher
Techiman Municipality	Techiman MoFA office	MoFA staff KII	1 st Dec., 2016	Researcher	
		Aworopataa	Interviews with farmers	1 st Dec., 2016	Researcher, Assistants
	Tanoso	Plantain farmers' GD	1 st Dec., 2016	Researcher	
		Interviews with farmers and traders	2 nd & 4 th Dec., 2016	Researcher, Assistants	
		Tomato farmers' GD	2 nd Dec., 2016	Researcher	
		Tomato traders' GD	2 nd Dec., 2016	Researcher	
	Nsonkonee	Interviews with farmers	6 th Dec., 2016	Researcher, Assistants	
	Techiman market	Interviews with traders	23 rd Dec., 2016	Assistants	
		Market observation	23 rd Dec., 2016	Researcher, Assistants	
		Plantain traders' GD	23 rd Dec., 2016	Researcher	

Table 3 continued

Asutifi South	Hwidiem MoFA office	MoFA staff KII	20 th Dec., 2016	Researcher
	Amanfrom	Interviews with farmers	20 th Dec., 2016	Assistants
		Plantain farmers' GD	20 th Dec., 2016	Researcher
	Nkrankrom	Interviews with farmers	20 th Dec., 2016	Assistants
	Acherensua	Tomato farmers' GD	20 th Dec., 2016	Researcher
		Interviews with farmers	27 th Dec., 2016	Assistants
	Hwidiem market	Interviews with traders	27 th Dec., 2016	Assistants
		Market scene observation	27 th Dec., 2016	Assistants
		Plantain traders' GD	27 th Dec., 2016	Researcher

Source: Field survey (2016)

Interviews with farmers were conducted in the three selected communities in each district while the interviews with traders were held at the major markets in each district by both the researcher and the assistants. Separate group discussions for farmers in the selected communities and traders in the selected markets were all led by the researcher. There were two farmers' GDs (plantain and tomato) and two traders' GDs (plantain and tomato) organised in each district, except Asutifi South District where the tomato traders' GD could not be held.

With the use of the GD guide, a deeper understanding of the perception of farmers and traders on the issues affecting food produce marketing and farmer-trader relationships were obtained. In most cases, the groups were made up of 11 or 12 participants in line with the recommended number of about eight to 12 participants for effective discussions (Smith & Albaum,

2012). However, in a few cases the numbers went above 12 and reached 19 when it became extremely difficult to talk people out of the groups.

The interview guide was used for the collection of information from key informants who were MoFA staff on district and community profiles by the researcher. A discussion with a MoFA staff in charge of crop production in the Techiman Municipality happened on 1st December, 2016. Another KII was held with a MoFA staff in charge of Management Information Systems in the Asutifi South District on 20th December, 2016. The last of the KIIs happened with the MoFA Director of Tano North District at Duayaw Nkwanta on 27th December, 2016.

The market scenes were observed by both the research assistants and the researcher using the observation guide, about how farmers and traders related during transactions as well as how plantain and tomato were handled at the market. The observations were conducted at each of the district markets in the study districts. The markets are Hwidiem in Asutifi South District, Techiman in the Techiman Municipality and Duayaw Nkwanta in the Tano North District.

The market observations were done to complement and enhance data obtained through the use of the other data collection instruments described earlier for the purpose of using triangulation to ultimately create confidence in the findings of the study. The observations were carried out carefully in order not to alter the naturalness of the market setting (Denscombe, 2010). In order to ensure that quality data were collected, supervision was also provided throughout the data collection period where any identified gaps were

addressed. For instance, during the first few market observations, some assistants failed to keep their notebooks and pens out of view which had the tendency of disturbing the natural flow of the processes. With closer monitoring and guidance provided by the researcher, this practice was checked and data collection improved.

Field Challenges

A few challenges were encountered in the course of collecting data in the field, especially at the markets. Most of the respondents selling their wares at the market had a divided attention when interviews were being conducted. Data collectors had to wait for several minutes or go and come on a number of occasions before interviews could complete as the traders were attending to their customers. In two cases, respondents abandoned the interviews altogether mid-way as they found the interviews too distractive of their business transactions at the markets.

Some traders' GDs had to be rescheduled because the minimum recommended number of about eight participants for effective discussions (Smith & Albaum, 2012) could not be attained as the traders were too busy to join the discussion. For instance, the GD for tomato traders at Hwidiem market in Asutifi South District had to be rescheduled again and again until it became too costly to be carried out. Moreover, there were some respondents who were suspicious about the real intentions of the research despite the explanations given or were just not interested in such an academic exercise from which they found no immediate and direct benefits.

The issues arising from the field data collection had implications for the actual sample used for the data analysis. The actual number of interviewed farmers was 269 as compared to the initial number of 286. The number of traders who were interviewed was 79 instead of the initial number of 100. Thus there was a reduction in the sample size from 386 to 348 which gives a response rate of 90 percent. The actual sample size of 348 was used in the data analyses.

Data Processing and Analysis

Data analyses involve the process of bringing coherence, structure and meaning to the amount of data collected. The study used both quantitative and qualitative methods in analysing the data. Bhattacharjee (2012) and Morgan (2014) argue that the combination of quantitative and qualitative methods allows for a comprehensive examination of the research questions to generate unique insight into the complex social phenomenon being studied. Additionally, Palys and Atchison (2014) assert that it provides greater confidence since data is analysed in a manner that enables a credible interrogation of research conclusions.

Qualitative analysis focuses on data that do not easily lend themselves to quantitative measurement and may take the form of written or spoken words and visual images (Denscombe, 2010; Williams, 2007). In the analysis, a deliberate attempt is made to move beyond describing what the case is to explaining why that is the case when data has been collected to help in understanding the situation. Pham (2018) asserts that the analysis of qualitative data begins in the field when the researcher is engaged in

observation, interviewing, or both. The responses to open-ended questions, information from the group discussions and the observation exercises were prepared for analysis.

For this study, qualitative data were analysed in line with the process that Schutt (2012, p. 325) has identified as shared by most approaches of qualitative data analysis:

1. Documentation of the data and the process of data collection
2. Organisation/categorisation of the data into concepts
3. Connection of the data to show how one concept may influence another
4. Corroboration/legitimation, by evaluating alternative explanations, disconfirming evidence, and searching for negative cases
5. Representing the account or reporting the findings

Thus, the data analysis was carried out by transcribing text from audiotapes, exploring the data to be familiar with it, identifying the themes and noting the similarities and differences in the accounts of respondents especially from the GDs. The broad themes identified included issues affecting food produce marketing, farmer-trader relationship and profitability for the responses from both the farmers' and traders' GDs and interviews. Some other issues identified that were specific to farmers' and traders' responses were farmer production decisions and price integration respectively.

Effort was made to include necessary nuances, figures of speech and idiomatic expressions that were made by the respondents in the transcript in order to offer explanation for some aspects of their social life (Punch, 2009; Schutt, 2012). The data were coded and identical codes were grouped to form

broad themes or categories and concepts (Denscombe, 2010). The data were analysed according to the research questions of the study. Moreover, relevant quotes from transcripts were selected to illustrate and provide insights (Denscombe).

For the quantitative data analysis, responses to the interview schedules were prepared for analysis using the Statistical Product and Service Solutions (SPSS) version 25.0 by first cleaning, editing and coding the data. Both descriptive and inferential statistics were applied to analyse the quantitative data. The descriptive statistics helped to explore the data to be able to describe the distribution of variables and the relationship among them before any further analysis was done (Bhattacharjee, 2012).

The descriptive statistics this study made use of included frequency distribution, percentages and graphs in the analyses. Under objective one, group data on farmers and traders such as their socio-economic characteristics including sex, educational attainment and marital status were distributed into categories. Through this, the number of observations in each category was indicated which helped to summarise the distribution of responses to provide numerical representations for further analysis. Percentages were found for such variables as age, educational attainment and credit access of farmers and traders. Graphs were used to represent the seasonality of plantain and tomato prices under objective two. Under objective three, graphs were also used to show the scree plots of eigenvalues after factor rotation in the factor analysis of the relationship between farmers and traders.

Schutt (2012) points out that inferential statistics are used in deciding whether it is likely that an association exists in the larger population from which the sample was drawn. Regression analyses were used under objective two to establish the price relationships among the three spatially separated markets to find the extent and speed of price transmission among the markets so as to determine marketing efficiency. Lohano and Mari (2012) applied the same measure to assess the extent and speed of price transmission among food produce markets.

It is noted that if markets in different locations are integrated, then there exists an equilibrium relationship among the markets (Acquah & Owusu, 2012; Nkendah & Nsouessin, 2006). The long-run equilibrium relationship for analysing spatial market integration used in previous studies such as Lohano and Mari (2012) is specified as Equation (1):

$$P_t^1 = \alpha + \lambda P_t^2$$

where P_t^1 and P_t^2 represent prices of a similar food produce in two alternative district markets at time t , and α and λ are unknown parameters. If two markets are perfectly spatially integrated, then $\lambda = 1$ (Lohano & Mari, 2012). This represents a situation where, price changes in one market are fully reflected in the alternative market. When $\lambda \neq 1$ ($\lambda < 1$ or $\lambda > 1$), then the degree of integration may be determined by investigating how far the deviation of λ is from unity.

Since the above model of long-run relationship between markets may not satisfy at each time period, short-run dynamics is integrated with the long-

run relationship and an error correction model representation of Equation (1) is indicated as:

$$\Delta P_t^1 = \beta_0 + (\beta_1 - 1)(P_{t-1}^1 - \alpha - \lambda P_{t-1}^2) + \gamma_0 \Delta P_t^2 + \varepsilon_t$$

where ΔP_t^i represents change in the price ($P_t^i - P_{t-1}^i$) at district $i = 1, 2$; β_0 , β_1 , and γ_0 are unknown parameters, and ε_t is the error term. In this model, $(P_{t-1}^1 - \alpha - \lambda P_{t-1}^2)$ measures the extent to which the long-run relationship is not satisfied at time period $t-1$. The parameter $(\beta - 1)$ is interpreted as the proportion of the resulting disequilibrium adjusted in the next period. Therefore, the term $(\beta - 1)(P_{t-1}^1 - \alpha - \lambda P_{t-1}^2)$ is the error correction term. The adjustment process makes sense if $0 \leq \beta_1 < 1$. When β_1 is close to 0, the speed of adjustment to long-run equilibrium is very fast. When β_1 is close to 1, the speed of adjustment is very slow (Lohano & Mari, 2012).

Following Sulewski and Kłoczko-Gajewska (2014), the determinants of the level of risk of farmers were analysed using regression analysis under objective four. Ordered logistic regression or logit model was employed to estimate the factors influencing the risk level of food crop farmers in response to weather, price and other uncertainties in relation to their decision to produce for the market. The dependent variable was the self-evaluation of the farmer of his/her risk level on a 10-point scale grouped into risk averse, risk neutral and risk loving. Risk levels were modelled using a set of explanatory variables or predictors contained in the model.

The regression model is specified as:

$$Y_i = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + \dots + b_nX_n + e_i$$

where Y_i = Risk level (dependent variable); and the independent variables are X_1 = sex (Sex); X_2 = Age (Age); X_3 = household size (HHsize); X_4 = household headship (HHead); X_5 = educational level (Edu); X_6 = distance to nearest market (Distance); X_7 = transport ownership (TransO); X_8 = FBO membership (FBO); X_9 = Access to storage facilities (Store); X_{10} = Access to credit (Credit); X_{11} = Access to extension services (ExtVisit); X_{12} = Farm size in cultivation (Farm_Ha); X_{13} = farming experience (FarmExp); and e_i = Error term. An error margin or alpha value of 5 percent was used for all inferential analysis in the study.

Each of the explanatory variables in the regression analysis is expected to have either a positive or a negative influence on the dependent variable. A positive sign of the coefficient implies that an explanatory variable in the regression analysis increases the probability of farmers investing their resources into the production of tomato and or plantain in spite of price, weather and other uncertainties according to their risk levels, and a negative one decreases it. The apriori expectation and measurement of the various explanatory variables in the model are thus indicated:

1. Sex (positive) – measured as a dummy, 1 for male and 0 for female. Male farmers are likely to invest more resources into the production of tomato and or plantain than female farmers
2. Age (negative) – measured in years. Older farmers are less willing to take risks in investing more resources into farming
3. HHsize (positive) – measured as number of people under tomato or plantain farmer's care. The larger the household size the more own labour become available to expand production

4. HHead (positive) - measured as number of people acting as heads. Household heads are more likely to take production and marketing decisions
5. Edu (positive) – measured as level of education attained. Education enables farmers to access and process information necessary to to expand production
6. Distance (negative) – measured in kilometers. Shorter distance to market centers improves market access and encourages increased production
7. TransO (positive) – measured as number of farmers who own their own transport equipment to cart food produce. Transport ownership by the farmer is likely to enhance market access and encourage increased production
8. FBO (positive) – measured as number of farmers who belong to FBOs. FBO membership improves information sharing and likely to encourage production
9. Store (positive) – measured as number of farmers who store produce. Ability to store food produce can improve farm profits and enable farmers to invest more resources
10. Credit (positive) - measured as number of farmers who get credit. Access to credit enables farmers to invest more resources to expand production

11. ExtVisit (positive) - measured as number of times farmers receive extension visits. Access to extension services has the potential of improving production
12. Farm_Ha (positive) – measured in hectares. The bigger the farm size, the more resources the farmer has to invest into more production
13. FarmExp (positive) – measured as number of years farmers have been engaged in farming. More farming experience has the potential of encouraging increased production

Conclusion

In this study, both the qualitative and quantitative methods were combined especially with interview schedule design and administration, and coding for the analysis of the data which enhanced the study. This means, the use of different methods can enhance the understanding of social phenomena. Additionally, responses from respondents and other research results were triangulated for better results. Chapter Five highlighted the influence development theories have had on government policies relating to food produce marketing. Chapters Six, Seven and Eight focused on the study results and discussions from primary data.

CHAPTER FIVE

FOOD PRODUCE MARKETING IN GHANA

Introduction

This chapter presents an analysis of the issues that affect food produce marketing in Ghana from secondary data to partly address objective one of this study. The data were obtained from annual reports and databases of Ministry of Food and Agriculture, Ministry of Trade and Industry and Ministry of Finance and Economic Planning. Other sources were books, journal articles and various documents that contained relevant information for the study. The data analysis involved document review by juxtaposing the issues that affect food produce marketing alongside the theories and the conceptual framework for the study. The chapter begins with an overview of the historical trend of how various development theories have influenced government policies that affect food produce marketing in different eras as a precursor to the situation in the present day.

Overview of Ghana's Economic, Agricultural and Trade Policies

Affecting Food Produce Marketing

Agricultural markets in less developed countries are known to have changed over the period since the colonial days as a result of the influence of various development theories on public policies. Spoor (1995) opined that in some cases, the changes were due to political ambitions of governments to spread state control over the entire economy. Agricultural, particularly commodity or produce markets have consequently been manipulated for these

purposes in most developing countries (Meijerink & Roza, 2007; Seini & Nyanteng, 2003; Spoor).

The rationale for the keen attention that has been focused on commodity marketing and food produce marketing, in particular, by policy makers in developing countries is provided in the literature. One rational identified that is important to note is that food produce marketing has the potential of boosting food production and farm incomes. Chamberlin (2007) and Wongnaa et al (2014) intimate that food produce marketing is strengthened as a means of engaging the largest portion of smallholders, and thereby increasing productivity and income and eventually reducing poverty. This is reflected in the conceptual framework of the study (Figure 3) which illustrates that socio-economic environment including price and non-price signals from the food produce market influence the decision that food crop farmers make to produce more in order to reduce poverty.

Historical evidence also provides a fundamental argument for a greater focus on food staples in relation to the process of agricultural transformation and its role in growth and poverty reduction at early stages of development. Diao et al. (2008) and de Janvry and Sadoulet (2010) argue that improving the food produce subsector, among all subsectors of agriculture, produces the greatest effect on poverty reduction because the poor are largely concentrated in the subsector. Moreover, the Food and Agriculture Organisation, FAO explains that poor farmers will only diversify into and then specialise in the production of export crops when they can be certain of remunerative market access for any increases in their surplus staples production (FAO, 2011).

In Ghana, the government has used both price and non-price market interventions in the agricultural sector as important instruments for the development of the national economy since the pre-independence era. This is because as a country with a dominant agrarian economy, the performance of the agricultural sector has important consequences for the entire economy Spoor (1995). For example, it is acknowledged that the overall GDP growth is generally within two percent of agricultural growth rates (Asuming-Brempong & Asafu-Adjei, 2000; Thirtle et al, 2001) which makes improving the agricultural growth rate good for the Ghanaian economy as a whole.

Thus, the Ghanaian government made the attempt to ensure that policies and strategies were in place to improve domestic food production and all other subsectors of agriculture (Dewbre & Borot de Battisti, 2008; Seini & Nyanteng, 2003). The policies were such that food produce markets were also affected. In this regard, the food produce marketing situation is discussed in relation to pre-Structural Adjustment Programme or pre-SAP, SAP and post SAP eras where the policies and strategies employed by government and the resulting levels of production and growth engendered will be highlighted.

Pre- SAP era

During the period between independence and the introduction of SAP, that is, from 1957 to 1983, the state intervened in the production and distribution of food produce to a large extent (Beckman, 1981). A number of reasons of economic, social and political nature have been assigned to this policy direction. For instance, Issahaku (2000) argues that the intervention in food produce marketing was partly occasioned by the need for providing food

for the growing urban population and curtailing the increasing dependence on food imports. The situation was created by the implementation of the import substitution industrialisation policy in line with the development model recommended by structuralists such as Lewis (1954), which had brought large numbers of factory workers into the urban areas (Jedwab & Osei, 2012). The policy was largely continued by successive governments in that era.

In the pre-SAP era, the government got heavily involved in agricultural marketing and food processing through the creation of parastatals of marketing boards, government-controlled cooperatives and processing units. The parastatals were often monopolies or sole buyers of agricultural produce, including basic food produce (Khor & Hormeku, 2006). Even though there had been private buyers in the food produce marketing system (Barrett & Mutambatsere, 2005), a situation of non-competitive market structure was thus created, especially in the more remote areas. According to agricultural marketing theory, this compromised efficient allocation of resources and reduced the benefits for food crop farmers who participated in the market (Barrett, 2005).

The parastatals involved in agricultural commodity marketing included the Ghana Food Distribution Corporation, the Grain Warehousing Company, the Livestock Marketing Board, the Ghana Cotton Company and the Cocoa Marketing Board and its affiliated organisations (Issahaku, 2000; Seini, 2002). Some important objectives of the parastatals were to obtain tax incomes for the government and in some cases also to gain political control (Meijerink & Roza, 2007). Among the parastatals, the Ghana Food Distribution Corporation

(GFDC) had the widest influence in staple food produce marketing in the country.

The GFDC was formed in 1971 when the existing food produce marketing institutions, namely, the Task Force Food Distribution Corporation and the Grains Marketing Board were merged under Legislative Instrument 714 (Asuming-Brempong & Asafu-Adjei, 2000; Seini & Nyanteng, 2003). Its main objectives were to promote food production through pricing and marketing policies in favour of food producers; and to ensure effective distribution of food throughout the country (Brooks, Croppenstedt & Aggrey-Fynn, 2007; Seini and Nyanteng).

Even though the GFDC bought a variety of food produce as well as imported agricultural products for distribution, it concentrated its efforts on maize and rice marketing using the guaranteed minimum prices fixed by a committee established by government (Khor & Hormeku, 2006). Thus, the guaranteed minimum prices served as stable prices for food produce farmers and, as Lohano and Mari (2012) indicate, may have provided signals for the farmers to keep supplying the market. This is inherent in the conceptual framework (Figure 3) which depicts that farmers' exchange of food produce with traders for money is necessary in a food produce market system. However, Khor and Hormeku further note that the price support programme became ineffective and even discouraged farmers owing to the fact that GFDC failed to purchase the quantity of produce offered by farmers.

Consequently, as La Verle (1994) and Seini and Nyanteng (2003) report, food production fell consistently in the pre-SAP period with a decline

in the food self-sufficiency ratio from 83 percent in 1961-66 to 71 percent in 1978-80 and an attendant increase in food imports of up to four times in the 1970s. According to Codjoe (2007), some of the key reasons that the low food production is attributed to, include lack of pricing and marketing incentives for farmers. These are illustrated in the conceptual framework of the study which indicates that socio-economic environment such as food produce markets are among the issues that influence household food production decision-making.

It is observed that the government intervened more in export crop markets than in food crop markets in Ghana. Seini (2002) and Brooks, Croppenstedt and Aggrey-Fynn (2007) explain that it is because food farmers have had the liberty to sell to private individuals or companies above the quoted guaranteed minimum prices and could resort to selling to the GFDC only in times of difficulty (Barrett & Mutambatsere, 2005). This is in contrast to the monopolistic situation of the non-food or export crop parastatals.

SAP era

Ghana implemented a Structural Adjustment Programme (SAP) between 1983 and 1992 mainly due to the economic challenges the nation encountered in the 1970s and early 1980s. The SAP which was promoted and funded by the World Bank and International Monitoring Fund (IMF) aimed to reduce government intervention and allow a free market mechanism to operate (Raikes, 1997). Consequently, the policies under SAP were underpinned by neoliberal free market theory and its "getting the prices right" and "trade is enough" schools of thought (Adelman, 1999; Harvey, 2005; Hausmann, Rodrik & Velasco, 2008). It is noted that the SAP involved three phases, the

first of which was a stabilisation period followed by an adjustment period from 1986 and finally the trade liberalisation period from 1989 to 1992.

By reason of its enormous contribution to the economy, agriculture attracted a lot of attention under SAP policy reforms as the sector that could resuscitate the economy (La Verle, 1994). According to Seini and Nyanteng (2003), the reforms that took place in the agricultural sector involved the restoration of incentives for the production of food and other crops temporarily in the first phase. There was also the removal of price controls in commodity and service markets as well as the liberalisation of export and import markets to reduce price distortions (Brooks et al., 2007). In reality, the removal of price controls in the food produce market may have changed little about the efficiency of the market since there were already private traders to whom farmers could sell at different prices.

The reforms in the second phase focused on increasing productivity and internal price stability. The third phase of the liberalisation included abolishing the guaranteed minimum price for maize and rice, the removal of all subsidies on agricultural inputs and the dissolution of the GFDC and other parastatals (Khor & Hormeku, 2006). The absence of parastatals in the food produce market suggested that the way was being paved for more market competitiveness. This is reflected in the assumptions of the agricultural marketing theory for a competitive market which include a large number of buyers and sellers, free flow of information and no barriers to entry (Ludicke, 2006). Maymin and Lim (2012) conclude that the agricultural commodity

market liberalisation was in anticipation of ensuring competitive markets towards market efficiency and stimulating economic development.

Private traders involved in food produce marketing could not immediately take up the opportunity created by the withdrawal of state control from agricultural commodity marketing to expand their engagement in the food produce market channels (Coulter & Onumah, 2002). Coulter and Onumah argue that little attention was given to developing institutions to help the private sector succeed in expanding its marketing activities. Subsequently, the slow response of the private sector to the privatisation policy created distributional challenges as they could not cover the country in a geographically equitable manner (Barrett & Mutambatsere, 2005; Seini & Nyanteng, 2003). Thus, the desired improvement in market efficiency might not have been achieved as there were fewer buyers in remote areas, in contrast to assumptions of the agricultural marketing theory for a competitive market.

Regarding agricultural growth in the SAP era, it is recorded that the improvement in macro-economic stability resulting from the implementation of SAP, coupled with good weather, significantly reversed the declining rate of agricultural growth that characterised the 1970s. For instance, the average annual agricultural growth rate rose from negative 1.2 percent during 1970-80 to about 2.4 percent between 1983 and 1988 (MoFA, 1997). It has been claimed that Ghana was able to turn its agriculture sector around primarily because of the country's economic reforms and that the whole economy was saved from decline by SAP (Konadu-Agyemang, 2000; Leturque & Wiggins, 2010).

In order to sustain and propel further improvements in agricultural growth, the Ghana government adopted a Medium Term Agricultural Development Programme (MTADP) in 1991, which projected an annual growth of four percent over the period 1991-2000 (Asuming-Brempong & Asafu-Adjei, 2000; Brooks et al., 2007). The MTADP, the first comprehensive policy framework for agricultural growth and development after many decades, was also aimed to promote market-oriented agriculture growth and private sector participation in the agriculture value chain at various levels (Dzanku & Aidam, 2013). This was in line with the neoliberal development theory underpinning the SAP which promoted privatisation.

A number of projects were designed to contribute to the achievement of the MTADP goals. One of these projects was the Agricultural Sector Improvement Project (ASIP) that focused mainly on improving market infrastructure and enhancing the processing of agricultural produce for markets (MoFA, 2007; Seini & Nyanteng, 2003). Others were the National Agricultural Research Programme (NARP) which aimed to strengthen the research activities in crop production, and the National Agricultural Extension Programme (NAEP). The NAEP and the NARP were both designed to have a collaborative influence on strengthening research-extension linkages to improve production of food crops (Ortiz et al., 2010).

Furthermore, an attempt was made to use the MTADP to correct the over-emphasis on export crops at the expense of food crops by targeting to attain food self-sufficiency and security by the year 2000 (La Verle, 1994). Consequently, as La Verle observed, the MTADP sought to improve extension

services for food crop farmers in order to address the need to increase local production of food. This seemed important for farmers who, according to the household decision-making theory, make decisions on the allocation of inputs for food production (Taylor & Adelman, 2003; Tzouvelekas, 2011) and might benefit from extension education in the decision-making process.

Despite the general increases in agricultural production, the annual rate of growth of the agricultural sector was below the target until the second half of the 1990s when an average annual rate of about four percent was recorded (MoFA, 2007). Even at this rate, the MoFA estimated the agricultural sector to be operating at only 20 percent of its potential. Moreover, there did not appear to be adequate efforts to improve domestic marketing of food produce beyond the provision of some market infrastructure (Ortiz et al., 2010; Seini & Nyanteng, 2003). The Ministry of Food and Agriculture (MoFA) argued that Ghana could have benefited from the full potential of agriculture if it improved agricultural marketing.

Post-SAP era

The post-SAP era, for the purpose of this study, is considered to be the period between 1992 and 2015. In the post-SAP era, the free market forces have continued to be used to determine prices and government policies have entrenched liberalised market economy in the country (Seini & Nyanteng, 2003; Brooks et al., 2007). Agricultural and trade policies, in particular, have been heavily influenced by the neoliberal theory with significant consequences on market institutions, imports and domestic food production. This influence is expected since, as Enu (2014) notes, the agricultural sector is a major

contributor to economic growth in Ghana and therefore the economic development policies in the country have focused on the sector with the view to improve economic growth and poverty reduction.

Government consequently finds it necessary to clearly define agricultural policies that are in line with the objectives of macroeconomic policies and programmes (Dzanku & Aidam, 2013). Thus, besides the MTADP period which started during SAP implementation, four policy framework periods with corresponding agricultural policies since SAP can be identified as follows:

1. 1996-2002 Vision 2020/Accelerated Agricultural Growth and Development Strategy (AAGDS),
2. 2003-2005 Ghana Poverty Reduction Strategy (GPRS I)/ Food and Agriculture Sector Development Policy (FASDEP I),
3. 2006-2009 Growth and Poverty Reduction Strategy (GPRS II)/FASDEP II,
4. 2010-2015 (GSGDA/FASDEP II/METASIP)

The government launched a much broader 25-year development framework titled Ghana Vision 2020 in 1996 after the MTADP. The Vision 2020 aimed to consolidate and secure high economic growth rate above eight percent annually and achieve a middle-income status by 2020 (Awal, 2012; Sowa, 2002). In support of the broader goals of Vision 2020, an agricultural policy termed the Accelerated Agricultural Growth and Development Strategy (AAGDS) was put in place in 1996. It aimed to increase the average

agricultural growth rate from four to six percent over the period 2001–2010 (BOG, 2004).

Even though the AAGDS apparently enabled the agricultural sector to register growth rates in the region of four percent in 2000 (MoFA, 2007), its contribution towards the improvement of food produce marketing was minimal since its objective that was related to marketing was rather on export trade. Nonetheless, some projects under AAGDS such as the Agricultural Subsector Services Investment Programme (AgSSIP) and the Village Infrastructure Project (VIP) provided market infrastructure in some farming communities to improve market access (Dzanku & Aidam, 2013). Improving market access is important for food produce marketing as it facilitates the exchange between farmers and traders. This is reflected in the conceptual framework of the study which alludes that the ability of farmers to exchange food produce with traders for money is necessary in a market system.

Government signed into the Highly Indebted Poor Country (HIPC) initiative for debt relief in 2001 in order to restore macroeconomic stability in response to the prevailing dire economic conditions (Awal, 2012). Administered by the World Bank and the IMF, the HIPC initiative required the preparation of Poverty Reduction Strategy Papers and thus the Vision 2020 was replaced with Ghana Poverty Reduction Strategy (GPRS I) (Asante & Owusu, 2013). It could be observed that the policy content of the GPRS I, planned for the period 2003 to 2005 (NDPC, 2005a), was essentially a reflection of the policy areas of the Vision 2020 which were all underpinned by the neoliberal theory. The theory espouses that promoting free markets to

allow the “invisible hand” of market prices to guide resource allocation would stimulate economic development (Maymin & Lim, 2012; Todaro & Smith, 2012).

A key objective of the GPRS I was infrastructure development and modernisation of agriculture targeting agricultural growth to increase from 2.1 percent in 2000 to 4.8 percent per year by 2004 (NDPC, 2003). Subsequently, the Food and Agriculture Sector Development Policy (FASDEP I) was formulated in 2002 to guide implementation of agriculture sector objectives indicated in GPRS I (Brooks et al., 2007; Dzanku & Aidam, 2013). Dzanku and Aidam report that the GPRS I and FASDEP I period was particularly characterised by impressive agricultural growth rates averaging 5.4 percent per annum as against the 4.8 percent projected.

The high agricultural growth rates recorded could be attributed to land expansion and yield improvements obtained as a result of the adoption of new technology, as has been the case historically (de Janvry & Sadoulet, 2010; MoFA, 2010a). Moreover, the food produce marketing system may have contributed to the agricultural growth rates, in line with Fuglie’s (2010) assertion that the influence of market systems and processes on farmers’ decision to produce is a source of growth. This is also captured in the conceptual framework for the study that identified the influence of the socio-economic environment including food produce markets on farmers’ production decisions as a factor that contributes to growth in food production and poverty reduction.

Furthermore, a second medium-term poverty reduction strategy, the Growth and Poverty Reduction Strategy (GPRS II) which was also an agriculture-led growth strategy was introduced in 2006 for the period 2006-2009 (Brooks et al., 2007; NDPC, 2005b). Therefore, in order to achieve the goal of GPRS II, agriculture was required to continue growing at the rate of six percent per annum over the strategy period (Sharma & Morrison, 2011). A necessary step was the formulation of an agricultural policy which would be an improvement on FASDEP I.

FASDEP II was thus prepared in 2007 to provide the policy direction towards the achievement of the expected role of agricultural sector in GPRS II. FASDEP II was to accelerate the modernisation of agriculture and provide the necessary inputs for a strong agro-processing industrial sector in the medium-to-long term (Asante & Owusu, 2013). The agricultural sector growth rate improved considerably in the GPRS II period from 7.4 percent in 2008 to 7.6 percent in 2009 (GSS, 2010). In spite of this growth rate, Dzanku and Aidam (2013) argue that significant features of modernised agriculture were not evident at the end of 2009.

Subsequently, a third economic development policy strategy termed Ghana Shared Growth and Development Agenda (GSGDA) was developed for the period 2010-2013 to generally address the challenges that existed in the economy and to guide Ghana's development efforts as an oil-producing country. The GSGDA policies aimed to accelerate agricultural modernisation, and reduce risk in agricultural production and marketing, among others (NDPC, 2010). Reducing risks seemed to be appropriate since risk is present

in all agricultural management decisions (Gomez-Limon et al., 2003) and smallholder farmers who dominate the sector are known to be risk averse (Ayinde, 2008; MoFA, 2007). This is consistent with the risk aversion theory which suggests that farmers and traders behave in ways that decrease their risk exposure when they identify risk (Mendola, 2007).

FASDEP II as a long-term agricultural policy continued to be used as the accompanying agricultural sector policy framework for the GSGDA strategy period. FASDEP II sought to facilitate the positioning of stakeholders in the sector to strategically take advantage of the emerging opportunities (MoFA, 2007). In particular, the strategy focused on some key areas such as commercialisation of agriculture, linking farmers to markets through value chains, value addition and a strong recognition of the food sector (Sharma & Morrison, 2011). In effect, FASDEP II focused on improving the efficiency of the food produce marketing system, in line with the agricultural marketing theory. The theory postulates that markets are efficient when assumptions for competitiveness, including numerous traders and perfect information are fulfilled (Federico, 2007; Hamm et al., 2012).

Additionally, a Medium Term Agriculture Sector Investment Plan (METASIP) was prepared as an investment plan to aid the implementation of the medium term programmes of FASDEP II objectives from 2011 to 2015. The targets for METASIP were to reduce by half the number of people living in poverty by 2015 in relation to Millennium Development Goal (MDG) 1; achieve at least six percent of agricultural growth; and ensure government expenditure allocation of at least 10 percent of the national budget within the

plan period (MoFA, 2010b). According to Boateng and Nyaaba (2014), METASIP was developed with due consideration of the relevant international, regional and sub-regional policies. Thus, the METASIP was consistent with the MDGs, ECOWAS Agriculture Policy (ECOWAP) and the Comprehensive Africa Agriculture Development Programme (CAADP).

A second GSGDA, GSGDA II, which was also agriculture-focused was formulated for the period 2014-2017 to build on the predecessor framework, GSGDA I. One key focus of the GSGDA II to accelerate agricultural modernisation was to enhance the competitiveness of the sector and ensure its integration into the domestic and international markets (NDPC, 2014). Policies and programmes formulated by governments over the years to ensure growth and development of the agricultural sector indicated the intention to address issues relating to agricultural marketing to make it more efficient. This is in consonance with the conceptual framework of this study which identified efficient food produce marketing as a necessary component of the socio-economic environment that influences farmers' decision to increase food production and reduce poverty.

Moreover, Ghana has used trade policies to influence the development of the agricultural sector. After import substitution policies were abandoned in the 1980s as a result of the perceived failure of the economic development strategies, Ghana has adopted explicit objectives of export-led development strategies (Sharma & Morrison, 2011). This has meant emphasising the promotion of both traditional and non-traditional exports, in line with the neoliberal theory. The theory advocates for governments to remove trade

barriers and price distortions in domestic markets and allow free markets to prevail (Todaro & Smith, 2012). In addition, governments are enjoined to apply comparative advantage to enhance capital accumulation in order to achieve economic development (Detlef, 2012; Rapley, 2007).

With the implementation of SAP policies and the continued reduction in trade barriers, it has become imperative to increase the competitiveness of local agricultural products such as food produce. This is because the non-competitive structure of agricultural markets is associated with price uncertainties and poor integration of markets (Alam & Begum, 2007; Atingi-Ego et al., 2006). The conceptual framework for the study indicates that market integration of the food produce market is necessary for prices to give favourable signals that inform farmers' decision to increase food production and reduce poverty. Dzanku and Aidam (2013) argue that competitiveness of local agricultural produce will ensure that commercialisation of smallholder agriculture is achieved as targeted under FASDEP II.

Ghana's trade policy, the Ghana National Trade Policy (GNTP04), was prepared in 2004 to provide guidelines for Ghana's domestic and international trade agenda (MoTI, 2004). The GNTP04 has two parallel strategies, one of which is an export-led industrialisation strategy and the other, a domestic market-led industrialisation strategy based on import competition. The policy content suggests that its overarching theme is export-orientation which may shift away attention from the promotion of competitiveness to enhance efficiency in the domestic food produce market. This is inherent in the neoliberal theory which espouses that competition

engenders a more efficient economy that better allocates scarce resources (Foxley, 2010). However, Sharma and Morrison (2011) have described the policy as both comprehensive and balanced in content.

The GNTP04's intent is supposed to give attention to promoting the competitiveness of local producers in both the domestic and the international markets. The strategy indicated a principle of promoting the private sector as the engine of growth. The Ministry of Trade and Industry (MoTI, 2004) argues that the need to expand the relatively small local market in order to accelerate economic growth has been one reason that makes international market a necessity. This is consistent with the neoliberal theory which also emphasises international trade by suggesting that when trade barriers are removed and free markets prevail, comparative advantage will enhance capital accumulation (Rapley, 2007; Rodrik, 2007).

A five-year implementation strategy of the GNTP04, named the Trade Sector Support Programme (TSSP) was implemented from 2006 to 2010 with a key objective to increase the competitiveness of Ghana's international and domestic markets (MoTI, 2014). With regards to international trade, Ghana adopted the Common External Tariff (CET) of the Economic Community of West African States (ECOWAS) in 2008 (WTO, 2010). However, the World Trade Organisation (WTO) observed in a 2014 trade policy review that progress on ECOWAS integration was slow even though member states concluded the negotiations on a review of the common external tariff (CET) for the sub-region in 2013 (WTO, 2014).

It is obvious that as a member of ECOWAS, a sub-region that is working towards a customs union, Ghana's policies will continue to be influenced by the ECOWAP which is the trade policy of ECOWAS. Tariffs have been used to achieve various policy goals including price stabilisation, food self-sufficiency, maintenance of rural-urban income equality and the promotion of exports (Sharma & Morrison, 2011). The agricultural sector in particular is affected by tariff which has been the main trade policy instrument in the agricultural sector and averages about 16 percent (WTO, 2014).

Seini and Nyanteng (2003) noted that the trade policies have increased competition for the local production of some agricultural produce. According to the neoliberal theory, competition generates efficiency in a market system (Foxley, 2010) and thus increased competitiveness is favourable to the growth in production of food produce. This is illustrated in the conceptual framework of the study which depicts that efficient food produce market is necessary to influence farmers' production and marketing decisions to increase food production and reduce poverty. On the other hand, Seini and Nyanteng further intimate that the liberalisation of food imports has made imported food produce compete strongly with domestic food produce, which negatively affects domestic production. Particularly affected are tomato, rice and poultry (Codjoe, 2007; Kachingwe, 2004; Khor & Hormeku, 2006).

The import surges have been associated with the lowering of tariffs on agricultural imports due to the SAP. It is noted that the domestic market was particularly susceptible to import surges when local production reduced. For instance, when domestic market share of tomato paste fell from 92 percent in

1998 to 57 percent in 2003, tomato paste imports also rose from 3,300 tonnes to 24,740 tonnes for the same period (Sharma & Morrison, 2011). Moreover, Anang, Zulkarnain and Yusif (2013) assert that because fresh tomato is an import substitute in Ghana, it is not only the tomato paste market that is affected by trade liberalisation but the competitiveness of the entire tomato industry. This poses a challenge to growth in the production of the crop since, according to the household decision-making theory, farmers' production decisions are influenced by market signals (Tiberti & Tiberti, 2015).

Ghana continues to import food for various reasons. For some commodities such as wheat, that are not produced in the country at all, imports have been regular and increasing in volume in order to meet the demand of the rapidly increasing population who are demanding diversified food products (Seini, 2002). Even though the country has been self-sufficient in the production of several food produce, the agricultural sector's inability to produce adequate quantities and variety of food has made it necessary to import the shortfall (Codjoe, 2007; MoFA, 2014). The inability of the food produce subsector to produce to keep up with emerging demand may possibly be due to the marketing challenges that have bedeviled the subsector. This is inherent in the conceptual framework of the study that emphasises the role of market signals in farmers' production decisions.

Additionally, the seasonal nature of production of some food produce necessitates the importation of food. Ghana has historically traded in food produce with its neighbours, which has recently been facilitated by the regional trade policies on free movements of goods and services (Adimabuno,

2010; MoFA, 2011). Adimabuno further notes that while Ghana exports maize and other food produce to neighbours such as Guinea, Niger and Togo, it has been importing tomatoes and onions from Burkina Faso and Niger in times of scarcity.

In the particular case of tomato, imports from Burkina Faso have tremendously increased since 2004. The imports shot up from 1,797 tonnes in 2004 to 7,890 tonnes in 2006 (Baba et al., 2013; Britwum, 2013) and have since continued to increase up to 7,000 tonnes per month (Robinson & Kolavalli, 2010a). The high imports are now threatening to displace Ghanaian tomato farmers (Attoh, Martey, Kwadzo, Etwire & Wiredu, 2014). Furthermore, van Asselt et al., (2018) report of a form of reverse trade between Ghana and some neighbouring countries where tomato is exported to Burkina Faso and Togo in the peak season and imported from same in the lean season. It is implied that so long as gaps exist between domestic supply and demand, Ghana will continue to import certain types of food items.

Nevertheless, the agricultural sector has seen some improvements since SAP and continues to improve owing to the implementation of the various policies and programmes. For instance, the share of agricultural sector in the national expenditure from 2001 to 2011 was an average of 9.3 percent, albeit below the stipulated minimum target of 10 percent of the Maputo Declaration of NEPAD (MoFA, 2013). Importantly, according to MoFA, the target was achieved in 2009 at 10.3 percent which has since been sustained. Moreover, food production has been increasing considerably at a rate of six

percent per annum in the period 2006 to 2012 which is significantly faster than the population growth rate (MoFA, 2016; WTO, 2014).

Overall agricultural growth rates, however, have not been commensurate with the increased agricultural expenditure. An average of 4.5 percent agricultural growth rate was achieved for the period 2001 to 2011 and an average of 3.7 percent for the period 2012 to 2015 as against the target of six percent in CAADP even though agricultural expenditure increased (MoFA, 2014; MoFA, 2017). MoFA further indicates that the highest agricultural GDP growth rate of 5.7 percent was achieved in 2013 with the lowest rate of 2.3 percent in 2012 as shown in Figure 5.

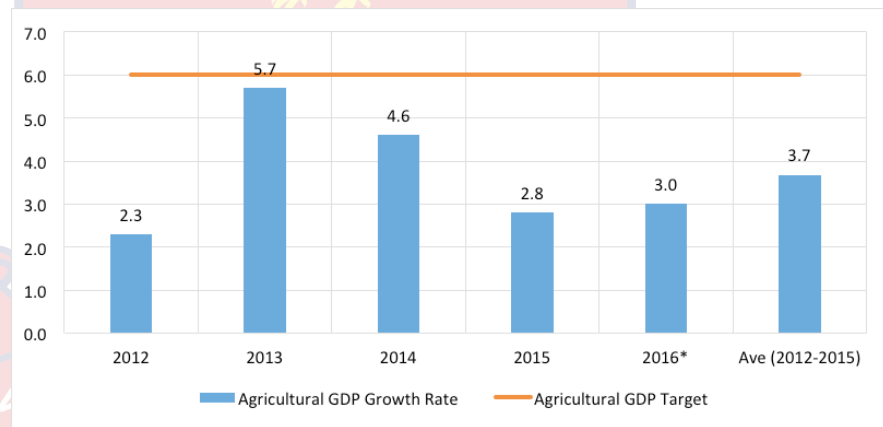


Figure 5: Agricultural sector growth rates for 2012-2015

Source: MoFA, 2017

An analysis of the various agriculture-related and trade policies in the last two decades generally seems to indicate an intention to modernise agriculture with the broad goal of ensuring that economic growth and structural transformation are propelled by the agricultural sector. In content, the policies appear to show an over-emphasis of promoting export-led agricultural growth to the disadvantage of domestic marketing of agricultural

produce. Clearly, as MoFA (2007) and Dewbre and Borot de Battisti (2008) indicate, the economic and agricultural policy and programmes implemented since the 1980s have radically changed the policy and market context in which smallholder food crop farmers in Ghana find themselves.

Food Produce Marketing System in Ghana

The structure of the food produce marketing system in Ghana is such that there are no formal market institutions but rather it is dominated by the private sector (Codjoe, 2007; Seini & Nyanteng, 2003). Consequently, purchases of food produce tend to be largely done on the spot basis as against the situation where stable long-term relationships between buyers and sellers provide assured markets. Easterling, Fox and Sands (2008) argue that the limited assured markets for many types of food produce contribute to make the food produce system weak in Ghana.

The food produce marketing system in Ghana typically consists of four main channels leading to the consumer which are: farmer-wholesaler-retailer; farmer-retailer; farmer-wholesaler-agri-industry; and farmer-agri-industry (Dzomeku et al., 2011). However, according to Ortiz et al. (2010), there are a few variations of the market channels such as the peri-urban channel which is a relatively short channel where farmers sell their produce directly to urban consumers. The farmer-wholesaler-retailer and the farmer-retailer channels are described as two-level channels because traders form the direct link between the rural farmers and urban consumers (Britwum, 2013).

With the farmer-wholesaler-retailer channel, Robinson and Kolavalli (2010a) mention two main variations that can be identified, one of which is

described as a long distance channel. The long distance channel involves itinerant wholesalers who go from house to house and as far as to the farm gate to buy food produce from farmers and transport to urban centers for reselling to resident wholesalers and/or retailers. Conversely, the other channel consists of a primary market where farmers sell their produce and many intermediate assembly markets where wholesalers gather and in turn sell the produce to urban wholesalers and/or retailers at relay markets (Ngeleza & Robinson, 2011).

There are advantages as well as disadvantages associated with each of the two-level marketing channels which make them suitable for the marketing of certain types of food produce. According to Adimabuno (2010), the channel involving assembly markets makes it possible for inspection and grading to be done and there is also better transmission of prices. Price transmission reflects market integration (Ankama-Yeboah, 2012) and thus better price transmission may enable farmers and traders to take advantage of better prices at the right time to increase incomes and reduce poverty. This is illustrated in the conceptual framework which identifies information or price transmission as vital for attaining spatial integration in food produce markets. Acquah et al. (2012) argue that shorter time lapse for long run price transmission sends more accurate price signals for farmers' marketing decisions.

The disadvantage with the channel involving assembly markets is that it takes a long time for the food produce to reach consumers in the urban centres and thus makes it unsuitable for perishable food produce. Ngeleza and Robinson (2011) and Britwum (2013) indicate that food produce distributed

through the long distance channel, on the other hand, travels much quicker from farmer to consumer. Thus, the long distance channel has become important for highly perishable food produce, particularly for vegetables such as tomato and staples like plantain and cassava.

Even though farmers basically have the choice to sell to itinerant traders or transport their food produce to nearby markets themselves, farmers of perishable food produce such as tomato mostly wait for the itinerant traders to buy from their farms (Robinson & Kolavalli, 2010a). Robinson and Kolavalli note that without this chance, some farmers leave the tomatoes to rot on the farms since the local market is often limited. Such decisions are based on profitability concerns as the price that farmers receive for their produce has critical implications for production and marketing decisions and consequently for poverty reduction (Jensen, 2010). This is inherent in the household decision-making theory which postulates that agricultural households deal with constraints including market factors when making resource allocation decisions in order to maximize utility (Tiberti & Tiberti, 2015).

The marketing of food produces such as plantain and tomato in the long distance channel is characterised by the presence of a large number of farmers and a few wholesale traders who distribute to consumers (Dzomeku et al., 2011). Ortiz et al. (2010) assert that the itinerant wholesale traders who are often referred to as 'market queens' are the most influential stakeholders. Moreover, Adimabuno (2010) observes that traders employ manipulative strategies to maximise profits which may include giving little room for farmers to engage in price negotiations. However, Britwum (2013) found that

leaders of farmer groups negotiated with traders to set the farm gate price of fresh tomatoes. This suggests that better organised farmers are less vulnerable than those without organised groups.

Porter et al. (2007) make a similar observation and further explain that farmers' disadvantaged position in price negotiations may be due to the fact that often trader information is the farmer's only source of information about pricing. Consequently, the market queens may take advantage of the usually high farmer uncertainty about market prices resulting from the remoteness of farmers' location and poor communications and offer very low prices for their produce (Courtois & Subervie, 2013; Robinson & Kolavalli 2010a).

With time, relationships develop between farmers and traders and become an important aspect of food produce marketing (Magistris & Gracia, 2008; Vieira et al., 2008) which may yield various benefits to both parties. As illustrated in the conceptual framework (Figure 3), relationship quality with attributes such as trust, commitment and satisfaction promotes food produce marketing. The benefits that farmers stand to gain when they enter into a long term relationship with the traders of their produce include the certainty to sell their produce even in times of glut, improved access to credit and higher incomes (Bijman, 2008). Adimabuno (2010) reports that as relationships are strengthened by trust, farmers in turn remain loyal and reciprocate by selling their farm produce to the traders and sharing reliable information about supply sources.

There is a wide range of highly complex formal and informal institutions that shape food produce marketing systems in Ghana. This is also

inherent in the institutional theory. The theory postulates that institutions that are composed of rules and norms of behaviours provide the incentive to structure the economy (North, 1990). Therefore, institutions regulate human interactions and regarding marketing, Kamarudin and Ismail (2002) explain that institutions impose social control and the exercise of collective action in markets. The formal institutions include district assemblies, ministries and agencies while farmers' and traders' associations are some of the informal institutions. Aksoy and Onal (2011) argue that the SAP reforms did not have significant institutional development to prepare these institutions to manage marketing shocks that emerged in the wake of the SAP implementation.

Traders and their associations appear to be more powerful than farmers as there are few functioning farmers' associations (Ngeleza & Robinson, 2011). The traders' associations, which have retailers and itinerant or sedentary wholesale traders, establish the rules of bargaining. In this way, traders influence competition and therefore price as they control the supply entering the markets and the number of traders who are allowed to sell (Ortiz et al., 2010). Limiting the number of traders has the tendency to reduce competitiveness of the market as captured by the agricultural marketing theory. The theory espouses that markets are competitive when there are a large number of buyers and sellers, no barriers to entry and free flow of information, among others (Jaleta & Gebremedhin, 2012).

There are different types of associations and self-imposed rules, in addition to national legal systems that affect how food produce marketing is done. The associations for the various produce types such as plantain and

tomato are formed principally to regulate disputes among their members and disseminate market information and information regarding farmers and retailers who are credit risks to members (Adimabuno, 2010). Some associations provide storage and protection from theft to their members as well as assisting members to access credit and hold members accountable to pay off debts in order to protect the reputation of all members (Britwum, 2013; Porter et al., 2007).

In the case of tomato, traders are well organised even into a national umbrella organisation called the National Tomato Traders Association which was formed in the 1980s (Robinson & Kolavalli, 2010a). It has a key aim to reduce price fluctuations and reduce the occurrence of situations where traders are unable to sell their tomatoes at a price that covers their costs, or even at any price, particularly during the peak period when the prices typically fall significantly (Ngeleza & Robinson, 2011). This is consistent with the risk aversion theory which espouses that when farmers and traders perceive risk, they will exhibit behaviour that decreases their risk exposure (Mendola, 2008).

Food production is highly seasonal and this has implications for the marketing of the produce in Ghana. Dankyi, Dzomeku, Anno-Nyako, Adu-Appiah and Gyamera-Antwi (2007) mention that because plantain production is mainly rainfed the harvest peaks up between September and December while it falls between April and July. Similarly, Robinson and Kolavalli (2010b) indicate that production of tomato in the rainfed areas of Ashanti and Brong Ahafo regions picks up from June onwards until December. Subsequently, tomato produced under irrigation conditions from Upper East

Region and Burkina Faso with a limited quantity also from Greater Accra Region takes over the market through to April or May. Thus, food produce prices also show seasonal variation where the prices fall during harvest periods and rise when the produce is out of season (Ankamah-Yeboah, 2012).

The seasonality encourages a dictation of price by the well-organised traders who literally form ‘cartels’ (Dzomeku et al., 2011). It is argued here that this situation often results in the reduction of farmers’ net returns and consequently their incentive to produce as illustrated in the conceptual framework of the study. The conceptual framework identifies the influence of the socio-economic environment including credit and food produce market with its price signals towards farmers’ decision to produce for poverty reduction. However, Robinson and Kolavalli (2010a) and Wongnaa et al. (2014) note that in general, farmers who are able to sell their produce directly to itinerant traders or wholesalers at the local markets are better placed to receiving higher prices than those who sell to local traders.

It is acknowledged that food produce traders deserve commensurate remuneration for the crucial service they provide. However, farmers also invest their resources in an even more high-risk environment with worsening climate change effects on agricultural production (Porter et al., 2007). In addition, market risks are borne by both farmers and traders in food produce marketing with rapidly changing market conditions (Girdziute, 2012; Gloede, Menkhoff & Waibel, 2011). The risks theory explains the coping strategies that each member of the food produce marketing channel adopts in the face of risks to sustain the food produce sub-sector.

CHAPTER SIX

ISSUES AFFECTING FOOD PRODUCE MARKETING IN BRONG AHAFO REGION

Introduction

This chapter presents the results and discussion of the issues that affect food produce marketing in the study area. The analysis for this chapter corresponds to objective one and focuses on the socio-economic issues of both farmers and traders. Matsane and Oyekale (2014) have observed that socio-economic factors of the farmer such as training, farming experience, age, level of education and household size are among the issues that affect food produce marketing. The analysis of the socio-economic characteristics of the traders is also presented to help identify the issues that affect food produce marketing.

The analysis of the issues, which is supported mainly by the relationship marketing theory and the household decision making theory and the conceptual framework as shown in Figure 3, is done on district and then on crop bases. Descriptive statistics such as percentages, frequencies and means are also used to analyse the issues that affect food produce marketing. This is based on applicable samples of 269 farmers and 79 traders from the three districts of Techiman Municipality, Tano North and Asutifi South who took part in the study. These sample sizes remain the same for each of the issues analysed for both farmers and traders, with the exception of the analysis on farmers' perception of the condition of road where 262 was used.

Socio-Economic Characteristics of Farmers

The socio-economic characteristics of farmers are categorised into socio-demographic, market practice and institution-related characteristics. Institution-related characteristics refer to respondents' access to services provided by certain institutions. The analysis of the socio-demographic characteristics of the farmers is first presented, followed by institution-related characteristics of the farmers and then marketing practice characteristics of farmers in the study area.

The socio-demographic characteristics of the sampled farmers cover sex, age, educational attainment, marital status, household status and household size. Table 4 shows the sex distribution of farmers in the study area. The results indicate that, overall, male farmers form 81.8 percent and thus far outweigh their female counterparts who form only 18.2 percent in the study area. Similar trend was observed for the respective districts sampled for the study. It was revealed that Asutifi South District has the largest proportion of male farmers (85.7%) in the study area followed by Tano North (81.3%) with Techiman Municipality being the least (76.6%).

The result implies that the number of males involved in food crop production far outstrips that of their female counterparts in the study area. This is consistent with the findings of Egbetokun and Omonona (2012) that the majority of the farmers (75%) in a study that assessed the determinants of farmers' participation in food market were males.

Table 4: Sex Distribution of Farmers

District	Techiman Municipality			Overall
	Tano North	Municipality	Asutifi South	
Male	65	59	96	220
	81.25	76.62	85.71	81.8
Female	15	18	16	49
	18.75	23.38	14.29	18.2
Total	80	77	112	269
	100	100	100	100

Source: Field survey (2016)

Table 5 shows the age categories of farmers in the study area. The results indicate that overall, 27.5 percent of farmers in the study area are above the economically active age, with reference to the Ghana Statistical Service (GSS, 2008) standard of between 15 and 64 years. Among the districts, it was observed that the number of farmers above 65 years constitutes 31.3 percent, 29.9 percent and 23.2 percent for Tano North District, Techiman Municipality and Asutifi South District respectively.

The results further indicate that, overall, the lowest number of farmers was found in the 25-29 age category, even though it varied from district to district. Among farmers in the Tano North district and Techiman Municipality, it was observed that the lowest percentages were within 30-34 (5%) and 40-44 (5.2%) age categories respectively. However, among farmers in the Asutifi South District it was observed that the lowest percentage (7.1%) of the farmers was within the age category of 25-29 and 45-49 years.

Table 5: Age Distribution of Farmers

Age Group	Tano North	Techiman	Asutifi South	Overall
25-29	5	5	8	18
	6.3	6.5	7.1	6.7
30-34	4	9	9	22
	5.0	11.7	8.0	8.2
35-39	10	16	18	44
	12.5	20.8	16.1	16.4
40-44	13	4	21	38
	16.3	5.2	18.8	14.1
45-49	14	13	8	35
	17.5	16.9	7.1	13.0
50-54	9	7	22	38
	11.3	9.1	19.6	14.1
65+	25	23	26	74
	31.3	29.9	23.2	27.5
Total	80	77	112	269
	100.0	100.0	100.0	100.0
Pearson $\chi^2(12) = 20.8330$				
Pr = 0.053				

Source: Field survey (2016)

The result is an indication of an ageing labour force engaged in food production. Matsane and Oyekale (2014) have made a similar observation and have inferred that young people are not interested in farming and may be migrating to find jobs in the city or they are in the village but engaged in other activities other than farming, a situation that can reduce food production and marketed surplus and worsen the incidence of poverty.

As seen in Table 6, overall, 55.8 percent of the farmers had primary, middle or Junior High School education, followed by 30.1 percent who had no

formal education and 13.4 percent who had secondary, technical or vocational school education. The results further revealed that the level of education with majority of the sampled farmers in each of the districts were those that have had primary, middle or Junior High School education. Tano North District had 63.8 percent followed by Asutifi South District with 57.1 percent and Techiman Municipality which had 45.5 percent.

Table 6: Educational Level Attained by Farmers in Selected Districts

Education Level Attained	Tano North	Techiman Municipality	Asutifi South	Overall
No formal education	16	34	31	81
	20	44.2	27.7	30.1
Primary/Middle/JHS	51	35	64	150
	63.8	45.5	57.1	55.8
Secondary/Tech/Voc	13	7	16	36
	16.3	9.1	14.3	13.4
Post-Secondary educ	0	1	1	2
	0	1.3	0.9	0.7
Total	80	77	112	269
	100	100	100	100

Pearson $\chi^2(6) = 12.9683$
 Pr = 0.044

Source: Field survey (2016)

On the other hand, the proportion of farmers who have attained post-secondary education with the potential of becoming middle level technical people was generally low for all the districts. The result gives an indication that family labour as a resource that most farm households use in production and marketing decisions may not adequately support increased food production and poverty reduction efforts of households. This is inherent in the

conceptual framework of the study which shows that family labour is an important resource that farmers need in their decision to increase food production to improve farm incomes and reduce poverty. Botlhoko and Oladele (2013) have noted that literate farmers are likely to adopt new innovation than illiterate farmers, hence, their productivity increases resulting in greater farm profit.

Table 7 presents the status of the farmers in their respective households. Majority of the sampled farmers are household heads. Overall, it was observed that 92.2 percent of interviewed farmers were household heads. Similar pattern is observed across the three districts. However, there are more household heads in Tano North District (98.8%) and Techiman Municipality (97.4%) as compared to Asutifi South District (83.9%). The unitary household approach suggests that households behave as individuals and that household decision-making is done through a single household head (Ligon, 2011; Mendola, 2007). According to Mendola, the majority of the respondents are likely to be responsible for taking production, consumption and marketing decisions for their households.

Table 7: Household Status of Farmers

Household Head	Tano North	Techiman	Asutifi South	Overall
Yes	79 98.8	75 97.4	94 83.9	248 92.2
No	1 1.3	2 2.6	18 16.1	21 7.8
Total	80 100	77 100	112 100	269 100

Pearson $\chi^2(2) = 18.3112$

Pr = 0.000

Source: Field survey (2016)

Table 8 shows that overall, approximately 74 percent of the farmers are married. The rest are widowed, single, divorced or separated. A higher proportion of the farmers in Asutifi South District (79.5%) are married relative to their counterparts in Tano North District (73.8%) and Techiman Municipality (64.9%). The results suggest that family labour is an available resource for most farm households to utilise in the decision to increase food production. This is consistent with the conceptual framework of the study which alludes that family labour is a key resource that is necessary in farmers' decision to increase food produce for marketing to improve farm incomes. The results corroborate the assertion of Moobi and Oladele (2012) that a high percentage of married farmers helps to provide family labour for increased production and marketed surplus which contributes to poverty reduction.

Table 8: Marital Status of Farmers

District	Single	Divorced	Widowed	Separated	Married	Total
Tano North	4	7	8	2	59	80
	5	8.8	10	2.5	73.8	100
Techiman	7	8	12	0	50	77
	9.1	10.4	15.6	0	64.9	100
Asutifi South	9	2	8	4	89	112
	8.0	1.8	7.1	3.6	79.5	100
Overall	20	17	28	6	198	269
	7.4	6.3	10.4	2.2	73.6	100

Pearson $\chi^2(8) = 4.4829$

Pr = 0.070

Source: Field survey (2016)

Statistical evidence on household sizes of respondents provide important information for understanding farmers' production, consumption

and marketing decisions. From Table 9, the results show differences between the minimum and maximum household sizes. The minimum size is 1 while the maximum varies from 15 to 18. The statistics across the districts show a mean of between 6.11 and 7.28. Bryman et al. (2009) indicate that skewness of 0.000 represents normal distribution. However, the range of skewness as given by the results did not show a normal distribution of household sizes. Sirkin (2006) has suggested that the median could produce a supplementary representative average for a distribution. The results indicate that the median household sizes in Tano North and Asutifi South Districts were highest with the least in Techiman Municipality.

Table 9: Distribution of Household Size of Farmers

District	N	Mean	Std. Deviation	Median	Min.	Max.	Skewness
Tano North	80	6.34	3.233	7.00	1	18	0.56
Techiman Municipality	77	6.11	3.219	6.00	1	15	0.75
Asutifi South	112	7.28	3.011	7.00	1	15	0.23

N=269

Source: Field survey (2016)

The results show that the household size is higher than the national average household size of four in Ghana (GSS, 2014d) and it is an indication that the household size is high and most households are relatively large. In line with the household decision making theory, households are likely to utilise their own labour for production to increase marketed surplus to optimise their utility (Donnellan & Hennessy, 2012), as indicated in the conceptual framework in Figure 3. In a similar study, Egbetokun and Omonona (2012)

found a high modal household size and suggested that it implied a relative high food demand and a possible corresponding labour availability for food production.

Institution-related characteristics of farmers could have influence on how they experience the food produce market (Antwi & Seahlodi, 2011). Such characteristics include farmer-based organisation (FBO) membership, access to credit and access to extension service. The distribution of farmers who belong to an FBO is shown in Table 10. Overall, 69.9 percent of farmers do not belong to an FBO while 30.1 percent belong to an FBO. The highest percentage (39%) of interviewed farmers who belong to an FBO can be found in Techiman Municipality. It is followed by Tano North District (28.8%) with the least in Asutifi South District (25%). This corroborates the observation of Ortiz et al. (2010) that farmers are generally poorly organised and that there are few functioning farmers' associations.

Table 10: FBO Membership of Farmers

FBO Membership	Tano North	Techiman	Asutifi South	Overall
Yes	23	30	28	81
	28.4	37.04	34.57	100
	28.75	38.96	25	30.11
No	57	47	84	188
	30.32	25	44.68	100
	71.25	61.04	75	69.89
Total	80	77	112	269
	29.74	28.62	41.64	100
	100	100	100	100

Pearson $\chi^2(2) = 4.3264$

Pr = 0.115

Source: Field survey (2016)

The results as shown in Table 11 indicate that, overall, 94.8 percent of the farmers interviewed have no access to credit for production. A similar trend was observed across the districts with farmers in Asutifi South District (97.3%), comprising the largest, followed by farmers in Techiman Municipality (93.5%) and Tano North District (92.5%). Matsane and Oyekale (2014) have suggested that the low access to credit may be because many smallholder farmers do not have properties that may be held as collateral and may also be as a result of the lack of information about available sources of lenders, types of credits offered and the interest rates charged by borrowers.

Poor access to credit may reduce marketed surplus since access to credit is a key socio-economic issue that affects the household's decision to produce for the market and to reduce poverty (Laborte et al., 2009). This is also inherent in the conceptual framework of the study which illustrates that the socio-economic environment comprising credit and land rental markets, input and produce markets influence households' decision to make use of resources such as land, labour and capital in food production.

Table 11: Access to Credit for Production in Selected Districts

Access to Credit	Tano North	Techiman	Asutifi South	Overall
Yes	6	5	3	14
	42.9	35.7	21.4	100
	7.5	6.5	2.7	5.2
No	74	72	109	255
	29.0	28.2	42.8	100
	92.5	93.5	97.3	94.8
Total	80	77	112	269
	29.7	28.6	41.6	100
	100	100	100	100

Pearson $\chi^2(2) = 2.5622$

Pr = 0.278

Source: Field survey (2016)

As shown in Table 12, overall, farmers received close to two visits of agricultural extension agents in the last 12 months. The results further indicate that farmers in Asutifi South District received more extension visits (2.2 visits) than their counterparts in Tano North District (1 visit) and Techiman Municipality (2 visits). This reflects the low extension coverage in the region as a result of the low national extension agent to farmer ratio of 1:1,500 (MoFA, 2012) which makes it difficult for extension agents to visit farmers as frequently as is desirable. Responses from farmers’ group discussions confirmed that extension coverage has been scanty.

Table 12: Farmers’ Extension Visits, Distance to Nearest Market and Farm Size

Variable	Tano North	Techiman Municipality	Asutifi South	Overall
Average no. of extension visits received	1.0	2.0	2.2	1.8
Farm Size (Ha)	1.6	1.2	2.9	2.0
Distance to nearest market (Km)	7.0	6.5	4.7	5.9

Source: Field survey (2016)

Agricultural extension agents usually provide information on new and improved varieties as well as information on market availability that enhances the knowledge and market opportunities of farmers (Gebremedhin & Hoekstra, 2008). Therefore, it is expected that farmers in Asutifi South District who receive more extension visits than those in the other two districts will use more improved technology in farming. This may enhance productivity and

consequently enable the farmers to have more marketable produce which will contribute to poverty reduction.

A key informant of MoFA in Tano North District when asked on 27th December, 2016 to indicate how extension service delivery enhanced the chances of farmers to sell their food produce and increase farm income reported as follows:

“Our work facilitates that of farmers in several ways. We provide information about production technologies that enable them to have marketed surplus in the first place. Farmers are trained to participate effectively in value chains, which helps them to know what to produce and the right time to produce, how to present their produce for marketing and even how to negotiate prices based on market information. With such basics, farmers are set to improve their farm incomes and consequently their welfare.”

The response suggests that extension education provides critical information on issues including the utilisation of resources, the farming activities to undertake and the socio-economic environment such as food produce marketing that farmers need in their decision-making processes. The household decision-making theory indicates that these issues also present constraints in farmers’ production and marketing decisions to increase food production and reduce poverty (Enete & Amusa, 2010). Thus, extension education enhances the efficient use of farmers’ own and purchased farm

inputs to produce food crops in order to achieve maximum profit under a competitive market environment (Donnellan & Hennessy, 2012).

The assertion that extension education enhances food production and farm incomes was corroborated by farmers in the group discussions. There was a general indication from the farmers who receive extension education that they found extension education useful in improving their production as well as increasing farm incomes. The farmers explained that the education that the agricultural extension agents provide encourages them to invest money, land and other resources into plantain and tomato farming and marketing in ways that increase farm profits as implied in the conceptual framework in Figure 3. This is also consistent with the household decision-making theory which makes an assumption that the organisation of production by the household is efficient (Ligon, 2011).

The results in Table 12 also show the farm sizes across the districts in the study area. The table indicates that the overall farm size for farmers is two hectares. The results further indicate that overall, farmers in Asutifi South District have relatively larger farms (2.9 ha) than their counterparts in Tano North District (1.6 ha) and Techiman Municipality (1.2 ha). This confirms the prevalence of small-scale production systems among food crop farmers as also found by Egbetokun and Omonona (2012) in a study of farmers' participation in food markets in Nigeria. The small-scale production systems may limit the marketed surplus and the farm incomes of food crop farmers and hence has the tendency to keep the farmers in poverty. The Ghana Statistical Service (GSS,

2014e) observes that farm households have consistently recorded the highest poverty incidence among economic activity types in Ghana (39.2% in 2013).

The study results further show that, overall, farmers travel for 5.9 kilometers from their homestead to the nearest market. Across districts, the results show that farmers in Tano North District cover the longest distance to the nearest market (7 km) followed by Techiman Municipality (6.5 km) with Asutifi South District (4.7 km) covering the shortest distance as indicated in Table 12. Farmers in Asutifi South District may be better placed to receive higher prices than farmers in the other districts. This is in line with the reason provided by Sebatta et al. (2014) in a similar study in Uganda that the shorter the distance to market centres, the easier it is to access buyers who offer better payment terms. This is also reflected in the agricultural marketing theory.

The agricultural marketing theory postulates that competitiveness in agricultural markets generates market efficiency (Federico, 2007). Furthermore, Atingi-Ego et al. (2006) indicate that one of the characteristics of a competitive market is the presence of a large number of buyers and sellers. Therefore, fewer buyers of food produce in more remote areas negatively affects the competitiveness and the efficiency of the market and consequently reduces profits for farmers (Landes & Burfisher, 2009). Thus, the potential for food produce marketing to reduce poverty also decreases.

Besides the distance from farmers' homestead to market centres, the condition of the road has the potential to render the road network fit for the purpose of aiding the transportation of food produce from place to place. As seen in Table 13, the highest percentage (46.5%) of farmers interviewed

perceived the road condition as bad while the least (7.3%) perceived it as very good. The results show that this general trend runs through all the three study districts even though Tano North District appears to have the worst road condition, having the highest percentage (55.1%) of farmers perceiving the road condition as bad and also the least (2.6%) of those who see the road condition as very good. This suggests that the road infrastructure in the study districts is generally in a bad condition and this has an implication on the transportation and the marketing of food produce.

Table 13: Farmers’ Perception of the Condition of Roads

Road Condition	Tano North		Techiman		Asutifi South		Overall	
	N	%	N	%	N	%	N	%
Very good	2	2.6	3	3.9	14	13.1	19	7.3
Good	26	33.3	27	35.1	39	36.4	92	35.1
Bad	43	55.1	38	49.4	41	38.3	122	46.5
Very bad	7	9.0	9	11.7	13	12.1	29	11.1
Total	78	100	77	100.1	107	99.9	262	100

Source: Field survey (2016)

Bad road condition has the tendency of prolonging travel time to the nearest market and making farmers miss market opportunities of selling to traders who offer good prices. This is also illustrated in the conceptual framework of the study which emphasises that food produce farmers and their traders must be linked up for exchange to take place under conditions that engender spatial integration and market efficiency such as promoting market access.

Improved transport systems tend to facilitate market access which is critical for food produce because it is often bulky and/or perishable and

consumers are often a distance away from producing areas (Acquah & Owusu, 2012). For instance, Azam, Imai and Gaiha (2012) have studied smallholder market participation in Cambodia and concluded that physical infrastructure like roads increase the efficiency of both marketing and production of food produce.

Table 14 presents other issues affecting farmers' participation in food produce marketing including distance to the nearest market and number of extension visits. These are disaggregated according to the major crops farmers cultivate in order to find the differences among the groups of farmers. With regards to distance to the nearest market, the results indicate that farmers travel a distance of 5.9km to get to the nearest market. Overall, plantain farmers (6.7 km) cover a longer distance to the nearest market relative to the tomato (5 km) and other crop farmers (5.7 km).

The results suggest that plantain farmers may find it more costly carting their produce to the market centers and/or may have fewer buyers ready to buy from the farm gate than tomato and other crop farmers due to higher transaction costs. Bylund (2015) notes that transaction costs reduce the competitiveness and the efficiency of the market, which in turn affects profits and poverty reduction efforts of farmers. This is in consonance with the agricultural marketing theory which claims that a competitive agricultural market generates market efficiency in order to maximise benefits for market participants (Barrett, 2005; Shrestha et al., 2014).

Table 14: Other Issues Affecting Farmers' Participation in Food Produce Marketing

Variable	Other			Overall	Prob>F
	Tomato	Plantain	Crop		
Distance to the nearest market (Km)	5.04	6.72	5.66	5.93	0.259
Number of extension visits received	1.64	2.08	1.61	1.77	0.223

Source: Field survey (2016)

Considering the number of extension visits received in the last 12 months, the results from Table 14 indicate that plantain and other crop farmers received the highest number of extension visits (2 each) relative to the tomato farmers (1.6). This reflects the minimal government attention that has been focused on tomato and vegetable production and marketing in general, as compared to other staple food crops. Government agricultural services such as extension coverage, though generally low for smallholder farmers, have been even more scanty for tomato production and marketing. For similar reasons, Robinson and Kolavalli (2010b) also observed that data for the tomato sector have not been collected consistently at a national level since the 1980s.

The characteristics of farmers that relate to their marketing practices influence how they experience the food produce market (Antwi & Seahlodi, 2011). Practices such as storage, standardisation and grading are discussed. With regards to storage, it was found out that the sampled farmers do not store their produce before selling. The group discussions denoted that both tomato and plantain farmers do not consider storing their produce at all unless their intentions to sell harvested produce do not materialise. In their explanations,

the farmers generally expressed their dissatisfaction of the reality they faced regarding their inability to store the produce and benefit from higher prices to reduce their poverty. Thus the farmers, especially those producing tomato, called for refrigerated storage facilities to be made available in their communities.

The next issue addressed as part of marketing practices was standardisation. Robinson and Kolavalli (2010a) have indicated that standardisation practices in the food produce marketing system enable participants in food produce marketing to operate with less transaction costs. Table 15 shows the distribution of farmers who have standardised measure of selling. The results indicate that overall, 266 out of an applicable sample of 269 farmers are not guided by any standards.

The finding implies that making use of market information in price negotiations may be difficult for the majority (98.9%) of the farmers since prices usually relate to quality and weights (Coulter & Onumah, 2002). The conceptual framework of the study shows that market information is necessary in improving spatial market integration and consequently market efficiency of food produce markets (Acquah & Owusu, 2012). This ensures fair returns to farmers and contributes to poverty reduction (Alam & Begum, 2007).

Table 15: Distribution of Farmers with Standardised Measure for Selling

Standardised Measure for selling	Techiman Municipality			Overall
	Tano North		Asutifi South	
Yes	2	0	1	3
	66.67	0	33.33	100
	2.5	0	0.89	1.12
No	78	77	111	266
	29.32	28.95	41.73	100
	97.5	100	99.11	98.88
Total	80	77	112	269
	29.74	28.62	41.64	100
	100	100	100	100
Pearson chi2(2) = 2.3097				
Pr = 0.315				

Source: Field survey (2016)

Standardisation practices observed by farmers such as grading and sorting were considered for their implication on transaction costs and farmer incomes (Sefa-Dedeh, 2009). It can be seen in Table 16 that about 63.9 percent of the sampled farmers grade or sort their food produce according to size and quality before selling. Out of the 172 farmers who sort or grade their produce before selling, 40.1 percent are from Asutifi South while 34.3 percent and 25.6 percent are from Tano North District and Techiman Municipality respectively.

Table 16: Distribution of Farmers who Grade or Sort their Produce before Selling

Grading/Sorting	Tano North	Techiman	Asutifi South	Overall
Yes	59	44	69	172
	34.3	25.58	40.12	100
	73.75	57.14	61.61	63.94
No	21	33	43	97
	21.65	34.02	44.33	100
	26.25	42.86	38.39	36.06
Total	80	77	112	269
	29.74	28.62	41.64	100
	100	100	100	100
Pearson chi2(2) = 5.1464				
Pr = 0.076				

Source: Field survey (2016)

Within the districts, the results revealed that 73.8 percent of the sampled farmers in Tano North District grade their produce before selling while farmers from Techiman Municipality and Asutifi South District constituted 57.1 percent and 61.6 percent respectively. It could be inferred that most farmers in the study area considered grading or sorting of harvested produce as an important marketing practice which enhanced farm incomes and reduced poverty. In contrast, Matsane and Oyekale (2014) observed in a similar study in South Africa that majority (57.4%) of the farmers did not grade their produce before selling and suggested that it might have led to a decline in farm income.

Studies including those by Fischer and Reynolds (2010) and Giha and Leat (2010) explain that observance of good market practices such as grading improves relationship quality which has the potential of boosting market efficiency through the reduction of transaction costs. This is also illustrated in the conceptual framework of the study that shows the influence of relationship

quality comprising trust, commitment and satisfaction towards improving the efficiency of food produce markets.

The distribution of farmers whose marketing strategy is to give produce to traders and get paid later is indicated in Table 17. The table depicts that overall, 59.5 percent of the sampled farmers give their harvested produce to traders and get paid later. Table 17 further shows that 65.2 percent of the farmers in Asutifi South District give their produce to traders and get paid later while 58.4 percent and 42.5 percent of their counterparts in Techiman Municipality and Tano North District respectively do same.

Table 17: Distribution of Farmers who Give Produce to Traders and get Paid Later

Giving produce to traders and getting paid later	Asutifi South			Overall
	Tano North	Techiman	South	
Yes	42 26.25 52.5	45 28.12 58.44	73 45.62 65.18	160 100 59.48
No	38 34.86 47.5	32 29.36 41.56	39 35.78 34.82	109 100 40.52
Total	80 29.74 100	77 28.62 100	112 41.64 100	269 100 100
Pearson chi2(2) = 3.1607				
Pr = 0.206				

Source: Field survey (2016)

In a group discussion in Asutifi South District, farmers explained that they have a certain level of trust in the traders that their monies would be paid partly because the farmers were located in easy to reach areas. Contrarily, other farmers likened the practice of giving their produce to traders and getting paid later to the staking of lotto by which they meant that one might or might not receive the payment from the traders. Thus, in spite of the trust, farmers

still experience disappointments with some traders who never return to pay farmers.

The conceptual framework of the study identified the influence of trust, commitment and satisfaction as components of relationship quality in promoting market efficiency. This is also inherent in the relationship marketing theory which postulates that customers and sellers are long term partners in an exchange process based on trust and rooted in the marketing concept (Murphy et al., 2006). Murphy et al. observe that abuse of trust tend to ruin commitment and hence the relationship quality between farmers and traders.

Some socio-economic characteristics of farmers are disaggregated according to the major crops they cultivate to identify the differences among the farmers across the main crops cultivated. The study revealed that there are more male farmers producing tomato (71.4%), plantain (88.0%) and other crops (80.7%) than their female counterparts in the study area. The male dominance observed in all three groups is consistent with the findings of many studies. Anang, Zulkarnain and Yusif (2013) found that 78 percent of the respondents were males with 22 percent being females in a study of the tomato industry in Wenchi Municipality. Bortey and Osuman (2016) noted that 77 percent of tomato farmers were males with only 23 percent as women in a study in Ghana and attributed it to the risky nature of tomato production, and women seemed unwilling to take so much risk for fear of incurring debt.

In terms of age, the results in Table 18 showed that overall, tomato farmers are younger than their counterparts producing plantain and other crops

as their major crop. While the ages of farmers in all three groups are concentrated in the 31-40, 41-50 and 51-60 ranges, tomato farmers constitute the least (16.7%) as compared to farmers cultivating other crops (20.7%) and plantain (26.1%) in the 51-60 age range. This implies that overall, the tomato farmers are more youthful compared to the other farmers. Anang, Zulkarnain and Yusif (2013) observed a more youthful nature of tomato farmers of age 21 to 40 years in Wenchi Municipality and concluded that it was a positive development since the youth were noted to abandon farming in search of other jobs in major towns and cities.

Table 18: Age of Farmers by Major Crop Cultivated

Variable	Tomato		Plantain		Other crop		Overall	
	%	N	%	N	%	N	%	N
21-30	14.3	6	4.3	4	11.1	15	9.3	25
31-40	26.2	11	27.2	25	27.4	37	27.1	73
41-50	33.3	14	29.3	27	21.5	29	26.0	70
51-60	16.7	7	26.1	24	20.7	28	21.9	59
61-70	4.8	2	9.8	9	11.9	16	10.0	27
71-80	4.8	2	3.3	3	7.4	10	5.6	15

Source: Field survey (2016)

The study revealed that overall, more than half (69.9%) of the farmers do not belong to an FBO while 30.1 percent of them do. A higher proportion of the tomato farmers (42.9%) belong to an FBO relative to the plantain (23.9%) and other crop farmers (30.4%). The comparatively higher proportion of tomato farmers in FBOs may be attributed to the higher need that tomato farmers find to be together to negotiate with the traders for market access and better prices for their produce to avoid losses as compared to the other

farmers. This is inherent in the risk aversion theory which postulates that resource-poor smallholder farmer households have the objective of securing the survival of the household by avoiding risk (Mendola, 2007).

Robinson and Kolavalli (2010a) have noted that individual tomato farmers tend to have no room for price negotiations but the traders allocate a certain number of crates to the farmers which determines the quantity a farmer can sell. In a group discussion in Tanoso in Techiman Municipality, tomato farmers maintained that due to the high perishability of tomato, it is necessary for them to be in groups for their leaders to negotiate on their behalf in order to have adequate quantities to sell and at better prices. The study further shows that other crop farmers constitute a higher (8.2%) number of farmers who have access to credit compared to tomato farmers (2.4%) and plantain (2.2%), even though overall, credit access is low (5.2%) among the sampled farmers.

Socio-Economic Characteristics of Traders

The socio-economic characteristics of traders are also categorised into socio-demographic, market practice and institution-related characteristics. The socio-demographic characteristics of the sampled traders cover age, educational attainment and marital status. Table 19 shows the age categories of traders in the study area. The results indicate that overall, approximately half (50.6%) of the traders fall within the age range of 41-50 in the study area. It was also observed that within districts, the highest numbers of traders were found in the age range of 41-50 for Tano North (64.3%), Asutifi South (44.0%) and Techiman Municipality (42.3%). The table reveals that only 2.5% of the traders are above 60 years, which implies that the majority of the

sampled traders are within the economically active age, with reference to the Ghana Statistical Service (GSS, 2008) standard of between 15 and 64 years.

Table 19: Age Distribution of Traders in Selected Districts

Age	Techiman Munic.	Tano North	Asutifi South	Overall
21-30	0	3	0	3
	0	10.71	0	3.8
31-40	5	5	4	14
	19.23	17.86	16	17.72
41-50	11	18	11	40
	42.31	64.29	44	50.63
51-60	9	1	10	20
	34.62	3.57	40	25.32
61-70	1	1	0	2
	3.85	3.57	0	2.53
Total	26	28	25	79
	100	100	100	100

Source: Field survey (2016)

Table 20 presents the results on educational attainment of the traders. Overall, majority (77.2%) of the traders has primary, middle or Junior High School education as their highest educational attainment and 21.5 percent of the respondents are illiterates. Wongnaa et al. (2014) found 35 percent illiterate wholesalers and 26 percent illiterate retailers in a study in Ashanti Region and concluded that the traders were fairly literate. The results have an implication on marketing since according to Wongnaa et al., literate traders adopt new marketing ideas faster than illiterate ones. This may mean that literate traders process market information better for informed decisions in their trading business that enhances market integration. The conceptual framework of the study illustrates that the use of information is necessary in ensuring market integration and the efficiency of food produce markets.

Table 20: Educational Level Attained by Traders

District	No Education	Primary /Middle/JHS	Secondary /Tech/Voc	Total
Techiman Munic.	6 23.08	20 76.92	0 0	26 100
Tano North	4 14.29	23 82.14	1 3.57	28 100
Asutifi South	7 28	18 72	0 0	25 100
Total	17 21.52	61 77.22	1 1.27	79 100

Source: Field survey (2016)

As shown in Table 21, overall, more traders (37.97%) have between 11 and 20 years of trading experience, followed by 34.2 percent who have 1-10 years of experience and 17.7 percent of traders with 21-30 years of experience. Except for Tano North District where half (50.0%) of the traders have 1-10 years of experience, the overall pattern is observed in both Techiman Municipality and Asutifi South District.

Table 21: Years of Experience of Traders in Selected Districts

No. of years in trading	Asutifi			Overall
	Techiman	Tano North	South	
1-10	6 23.08	14 50	7 28	27 34.18
11-20	9 34.62	12 42.86	9 36	30 37.97
21-30	7 26.92	2 7.14	5 20	14 17.72
31-40	3 11.54	0 0	4 16	7 8.86
41-50	1 3.85	0 0	0 0	1 1.27
Total	26 100	28 100	25 100	79 100

Pearson $\chi^2(8) = 12.7978$

Pr = 0.119

Source: Field survey (2016)

In group discussions in all the study districts, the traders indicated that many of them understudied their relatives and friends who were in the trading business but as the more experienced traders advanced in years they retired from the trading business. The discussions stressed the importance of experience before one can make profit in the business. The discussants mentioned that a trader must basically know how to identify good quality food produce and where to source for same and be able to negotiate for good prices, among other things. Figure 6 illustrates how traders are attracted to good quality plantain.



Figure 6: Traders scrambling for plantain as farmers arrive with their produce at Hwidiem market

In one group discussion with tomato traders in Tanoso in Techiman Municipality, the discussants generally intimated that experience is important in marketing because it leads to success. Experienced traders are likely to make use of price and market information to take advantage of arbitrage

opportunities which, according to Jensen (2009), enhances market integration and profits for market participants. As suggested by agricultural marketing theorists, market integration improves market efficiency and social welfare (Shrestha et al., 2014).

Grading as a marketing practice was included in the study because of its influence on relationship quality between farmers and traders and consequently on market efficiency by reducing transaction costs (Fischer & Reynolds, 2010; Sefa-Dedeh, 2009). The study results showed that majority (91.0%) of the sampled traders graded their wares before selling, with nine percent indicating that they did not. This reflects the overall view of both wholesalers and retailers who trade in plantain and tomato. However, some differences emerged from the group discussions. Plantain traders indicated that grading was done by size and visual appeal as shown in Figure 7.



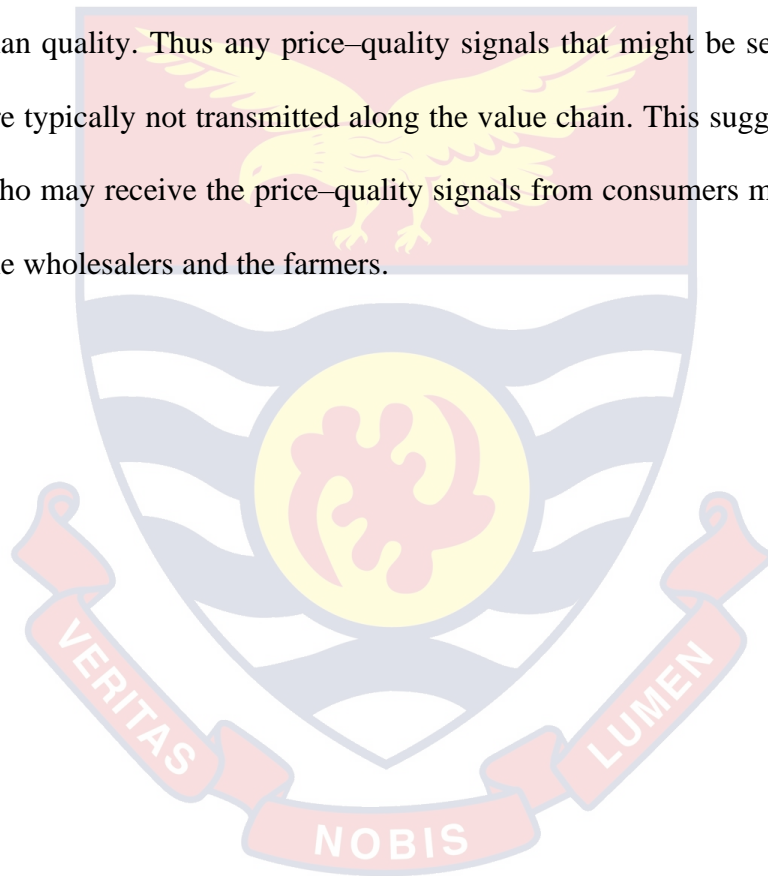
Figure 7: A Plantain Retailer Displaying her Graded Wares for Selling at Duayaw Nkwanta Market

Tomato traders, on the other hand, mentioned that in addition to size and visual appeal tomato was graded according to firmness (Figure 8). This corroborates the finding in a study in Ghana by Britwum (2013) that retailers graded tomato according to size, firmness and colour. A group discussion with tomato retailers at Duayaw Nkwanta revealed that grading as a marketing practice is taken more seriously by retailers than wholesalers. The retailers provided the general explanation that it was because they had direct link with consumers and they needed to maintain their trust that they would always sell quality tomatoes. This is also inherent in the relationship marketing theory. The theory espouses that customers and sellers are long term partners in an exchange process based on trust and rooted in the marketing concept (Murphy et al., 2006).



Figure 8: A Tomato Retailer Grading her Wares at Techiman Market

The retailers who buy from the wholesalers indicated that the wholesalers are not particular about the quality of tomatoes packed for them by the farmers that is why they as retailers often find poor quality tomatoes at the bottom of the crates. They emphasised that that was not the case when they bought from the farmers themselves. Robinson and Kolavalli (2010a) found a similar result and attributed it to the fact that wholesalers and farmers negotiate on the price per crate and, to some extent, the variety grown rather than quality. Thus any price-quality signals that might be sent by consumers are typically not transmitted along the value chain. This suggests that retailers who may receive the price-quality signals from consumers may not relay it to the wholesalers and the farmers.



CHAPTER SEVEN

SPATIAL INTEGRATION AND RELATIONSHIP QUALITY OF FOOD PRODUCE MARKETS

Introduction

This chapter presents the analyses of market efficiency of food produce from both price and non-price perspectives. The price perspective applies econometric analysis of market integration using spatial integration while the non-price applies behavioural analysis using relationship quality to assess the perceptions of farmers about the quality of the relationships between farmers and traders.

Market efficiency is of great importance in food produce marketing as it forms the basis by which farmers respond with agricultural production and marketed surplus (Alam & Begum, 2007). Moreover, according to Mensah-Bonsu et al. (2011), improving market efficiency is a way to increase social welfare by generating income for farmers and other chain actors including traders.

The conceptual framework for the study emphasises improving spatial integration as well as relationship marketing of food produce markets in order to influence the decision of farmers to increase food production and reduce poverty. The analysis of spatial integration of the food produce markets is underpinned by the neoliberal and agricultural marketing theories while the relationship quality analysis is guided by the relationship marketing theory.

Spatial Integration of Food Produce Markets

Acquah and Owusu (2012) have noted that spatial market integration of agricultural markets has been used as an indirect measure of market efficiency. Moreover, it has been observed that markets function efficiently when they are integrated in price relationships and the more integrated a market is the more efficient it is since it tends to be more competitive (Shrestha et al., 2014).

As shown in the conceptual framework, spatial integration of food produce markets is necessary for farmers and traders to stay linked up in a market system towards improving market efficiency. According to Acquah et al. (2012), spatial market integration is important to food production and marketing in particular because of the bulky and/or perishable nature of food produce, coupled with the fact that consumers are often located a distance away from producing areas and marketing may involve high transport costs.

Thus with regards to objective two of this study, wholesale prices of food produce at the major markets in the three districts (Appendix H) forming the study area were used to estimate the degree of spatial market integration. This provides an understanding of how food crop farmers are able to get remunerative prices and how consumers also get the produce at affordable prices towards poverty reduction and development.

Secondary data in the form of monthly wholesale nominal prices in GH¢ per 9-11 kg bunch of plantain and per 52kg box of tomato from January 2006 to December 2015 at three markets representing the three selected districts were collected from the Ministry of Food and Agriculture as indicated

in Appendix H. These markets are the district markets in the study area where Techiman represented Techiman Municipality and Duayaw Nkwanta, the Tano North District except Kenyasi market. Kenyasi market in Asutifi North District was used to represent the Asutifi South District because the market served as the district market for Asutifi District of which Asutifi South District was part until it was carved out in 2012 and price data continued to be jointly kept even up to 2015.

Consumer price indices for the various years (Appendix I) with 2010 as the base year obtained from Ghana Statistical Service were used to deflate the nominal prices into real prices. Real prices were used in the analysis in order to exclude correlation by inflation (Mensa-Bonsu et al., 2011).

Variations in Food Produce Prices over the Study Period

From Table 22, there have been variations in the prices of the food produce represented in the study in all the markets within the 10-year period studied. Plantain prices in Kenyasi and Techiman recorded increases in real prices of 104.4 percent and 190.6 percent respectively, while Duayaw Nkwanta market experienced the least increase of 21 percent in real prices. In a similar study of plantain prices in Cameroon, Nkendah and Nzouessin (2006) attributed the increases to the rise in the costs of transport and the dysfunctions of market such as information asymmetry.

Table 22: Variations in Plantain Prices from 2006 to 2015

Markets	Average Real Prices (GH¢/9-11 kg bunch)		Variations (%)
	Price in 2006	Price in 2015	
Techiman	2.03	5.90	190.6
Kenyasi	2.06	4.21	104.4
D/Nkwanta	4.07	4.94	21.4

Source: (2016) generated from MoFA (2017) as Appendix H

Table 23 indicates the variations in real prices of tomato in the three markets. The prices of tomato, on the other hand, were quite close varying between 270.4 percent and 317.3 percent with Duayaw Nkwanta market (317.3%) recording the highest and Kenyasi market (270.4%), the lowest. This observation points to the fact that food produce farmers may receive substantial increases in real prices if they have access to the market with no impediments.

Table 23: Variations in Tomato Prices from 2006 to 2015

Markets	Average Real Prices (GH¢/52kg box)		Variations (%)
	Price in 2006	Price in 2015	
Techiman	31.66	123.80	291.0
Kenyasi	32.76	121.34	270.4
D/Nkwanta	34.72	144.87	317.3

Source: (2016) generated from MoFA (2017) as Appendix H

The monthly wholesale real prices of plantain in the three district markets were plotted in Figure 9. It shows volatility in prices across time and the prices in the three markets appear to follow a similar pattern. This could be attributed to supply shocks arising from the seasonal nature of plantain production, perishable nature and relatively inelastic demand for plantain (Lohano & Mari, 2012).

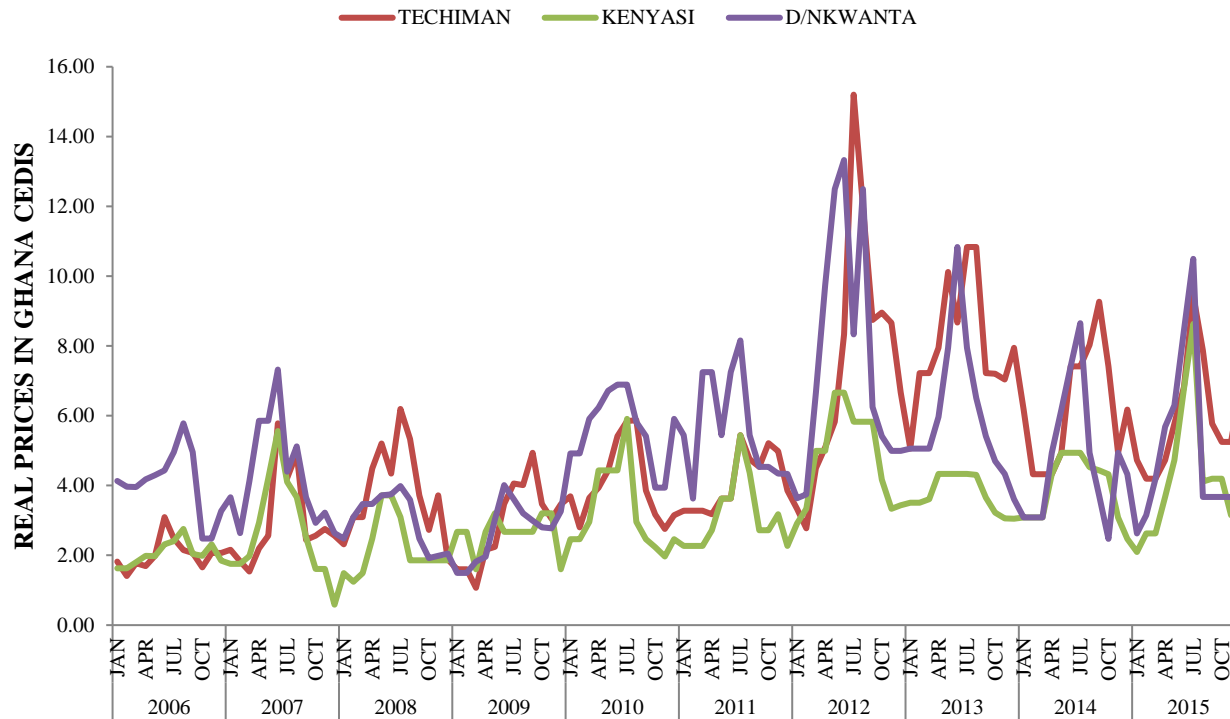


Figure 9: Plantain Monthly Wholesale Real Prices from Three Markets in Brong Ahafo Region (2006-2015)

Source: Amarchey (2016) generated from MoFA (2017) as Appendix H

Figure 9 shows that plantain wholesale prices generally begin to rise from April and get to the peak in July and then fall gradually until they reach their lowest between October and the end of the year. There is a gradual rise in plantain prices between January and April, at which point a sharp rise occurs and the cycle continues. Ankamah-Yeboah (2012) has noted that agricultural prices have often exhibited seasonal variation due to the annual nature of the crop cycle which makes the prices fall during harvest periods and rise when the produce is out of season.

Figure 10 presents the monthly wholesale real prices of tomato in the three district markets. Generally, there is volatility in the prices across time as well as an apparent similarity in the patterns formed by the price series in the various markets. The figure indicates that wholesale prices of tomato generally start rising from January after they have fallen to their lowest points in a couple of months around October. Tomato prices soar between January and July and reach the peak between April and July after which period they begin to fall. This reflects the general harvesting periods and availability of the crop in the Brong Ahafo Region from June to December as found by Britwum (2013) in a study on tomato marketing in Ghana.

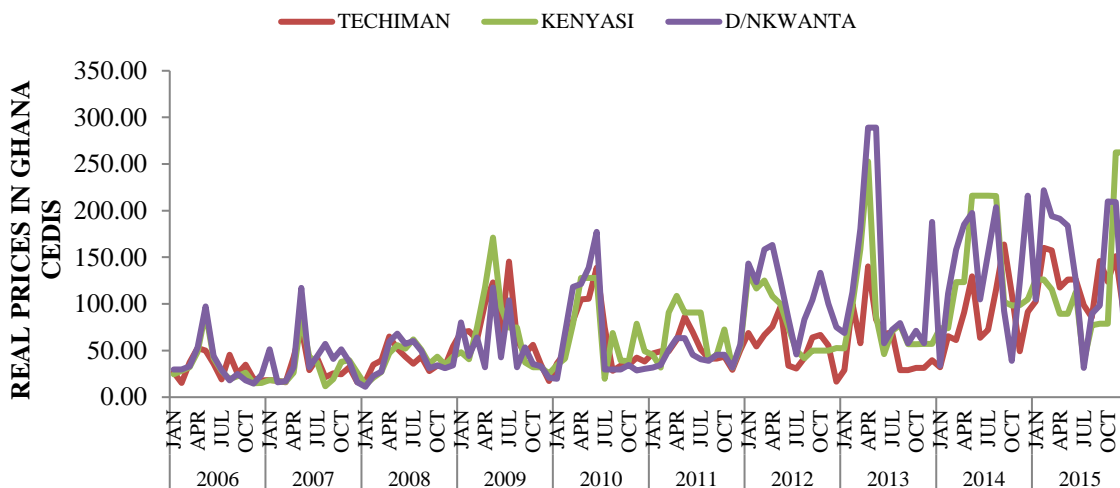


Figure 10: Tomato Monthly Wholesale Real Prices from Three Markets in Brong Ahafo Region (2006-2015)

Source: Amarchey (2016) generated from MoFA (2017) as Appendix H

The high prices of tomato in the first half of the year can be attributed to the importation of tomato produced under irrigation from Upper East Region and Burkina Faso into the region. Similarly, the low prices in the second half of the year could be explained by the availability of tomato from harvests in the Brong Ahafo Region in that period. This confirms the observation of Attoh et al. (2014) that seasonality in tomato production creates periods of abundance and scarcity which reflect in market prices in Ghana.

According to Ahmad (1995), stable prices are one of the most important factors that determine the profitability of an economic venture. Thus unstable tomato prices may negatively affect the profitability of tomato production and consequently reduce the incentive for farmers to produce more. This is illustrated in the conceptual framework for the study which suggests that market prices emanating from the food produce market influence the production decisions of farmers.

From the graphical presentations, it is not clear how the prices of plantain and tomato relate in the different markets since the apparent co-movement of the food prices between markets in different locations may not necessarily denote a price relationship (Mose, 2007). It is also difficult to visually analyse how the different markets will respond to shocks in a different market, which will give an indication of how integrated the markets are. The spatial market integration analysis therefore requires an econometric method such as the error correction method. The error correction model takes into account the adjustment of short-run and long-run disequilibrium in markets and time to remove disequilibria in each period (Ghafoor et al., 2009).

Spatial Market Integration Analysis

Applying the error correction method, spatial market integration was analysed by estimating the price relationship among the three spatially separated markets to find the extent and speed of price transmission among the markets (Mensa-Bonsu et al., 2011). Prices are known to give the signals that direct and coordinate the production and consumption decisions as well as the marketing decisions over time, form, and space (Lohano & Mari, 2012). This makes the coordinating and informational roles that prices play crucial to market performance and its efficiency. This is based on the neoliberal theory which advocates allowing market forces to operate to generate competition and thereby engender market efficiency as a key tenet (Hamm et al., 2012; Onis & Senses, 2005).

As a derivative of the neoliberal theory, the agricultural marketing theory incorporates market integration as a condition estimating the efficiency

of marketing systems (Wyeth, 1992). The theory postulates that changes in supply and demand conditions in one market will affect trade and therefore prices in other markets until equilibrium is restored through spatial arbitrage (Rapsomanikis et al., 2003).

The real monthly wholesale prices of plantain and tomato from January 2006 to December 2015 at Techiman, Kenyasi and Duayaw Nkwanta markets were used for this analysis. There were 120 observations for each series of price of plantain and tomato which were used in the regressions. With the three district markets, each market's price series was regressed with the other price series from the remaining two markets, giving a total number of six regressions of the error correction model for each plantain and tomato price series.

As a precondition for analysing any time series data, the price series were first tested for stationarity or unit root by performing the Augmented Dickey-Fuller (ADF) test and the Phillips and Perron test (Acquah & Owusu, 2012) using Eviews version 8 software. Even though ADF is more popular, the Phillips and Perron test is considered more powerful and therefore both tests were conducted to give maximum effect (Nkendah & Nzouessin, 2006). The results for the unit root test from both ADF test statistic and Phillips-Perron test statistic are reported in Table 24. Both tests reveal that at one percent level of significance, all the prices at all levels are stationary which means that none of the prices contain any unit root.

Table 24: Results for Stationarity (Unit Root) Test

Variable (Price in market)	Augmented Dickey-Fuller Test Statistic		Phillips-Perron Test Statistic	
	t- statistic	Test critical value (1%)	Adj. t- statistic	Test critical value (1%)
Plantain				
Kenyasi	-5.1380***	-3.4860	-5.2698***	-3.4860
Techiman	-3.7610***	-3.4860	-3.8093***	-3.4860
D’Nkwanta	-6.3651***	-3.4860	-6.2576***	-3.4860
Tomato				
Kenyasi	-5.0127***	-3.4865	-3.6122***	-3.4860
Techiman	-4.6324***	-3.4860	-4.4970***	-3.4860
D’Nkwanta	-7.3345***	-3.4860	-7.4697***	-3.4860

Note: *** indicates the significance at 1% alpha level
 Source: (2016) generated from MoFA (2017) as Appendix H

The results of the error correction model which present the estimates of parameters of the model including the intercept C , the adjustment parameter $\beta 1$ and the market integration parameter λ , their p-values and adjusted R-square of these regressions are presented in Table 25. Results for plantain markets in the table show that the estimated value of λ varies between 0.03 and 0.38 with mixed directional effects. The lowest (0.03) is found in the regression of Techiman on Duayaw Nkwanta prices and the highest (0.38) found in the regression of Duayaw Nkwanta on Techiman prices. The market integration parameters were significant for the Duayaw Nkwanta on Kenyasi (p-value = 0.00) and Duayaw Nkwanta on Techiman (p-value = 0.00) regressions while the rest were not significant.

Table 25: Results of Error Correction Model for Plantain and Tomato in Three Markets

Depend. variable (Price in market)	Independ. variable (Price in market)	Intercept C	Adjustment Parameter $\beta 1$	Market Integration Parameter λ Coefficient	Deviation from perfect integration $1 - \lambda$	Adj. R-square
Results for Plantain						
D/Nkwanta	Kenyasi	-0.02(0.92)	0.39(0.02)	-0.34(0.00)	0.66	0.16
D/Nkwanta	Techiman	-0.02(0.93)	0.18(0.23)	-0.38(0.00)	0.62	0.14
Kenyasi	D/Nkwanta	0.03(0.82)	0.13(0.01)	-0.11(0.25)	0.89	0.06
Kenyasi	Techiman	0.03(0.83)	0.02(0.85)	-0.14(0.14)	0.86	0.00
Techiman	Kenyasi	0.05(0.77)	0.01(0.92)	0.04(0.65)	0.96	-0.02
Techiman	D/Nkwanta	0.05(0.79)	0.05(0.39)	0.03(0.76)	0.97	0.01
Total					4.96	
Average					0.83	
Results for Tomato						
D/Nkwanta	Kenyasi	-0.27(0.97)	0.17(0.18)	-0.45(0.00)	0.55	0.20
D/Nkwanta	Techiman	-0.47(0.94)	0.70(0.00)	-0.47(0.00)	0.53	0.23
Kenyasi	D/Nkwanta	2.19(0.62)	0.10(0.14)	-0.05(0.83)	0.95	0.00
Kenyasi	Techiman	1.99(0.65)	0.36(0.01)	0.00(0.97)	1.00	0.03
Techiman	D/Nkwanta	0.78(0.76)	0.08(0.02)	-0.32(0.00)	0.68	0.12
Techiman	Kenyasi	0.47(0.86)	0.14(0.01)	-0.26(0.00)	0.74	0.10
Total					4.45	
Average					0.74	

Note: Numbers in parentheses are probability values of estimated parameters. D/Nkwanta represents Duayaw Nkwanta.

Source: (2016) generated from MoFA (2017) as Appendix H

The regression of Duayaw Nkwanta on Kenyasi plantain prices had a market integration parameter of 0.34 (34%) with a negative sign, an adjusted R-square of 0.16 and a p-value of 0.00 which is significant at 1 percent level.

This result shows that when plantain price increases by GH¢1.00 at Kenyasi

market it also reduces by GH¢0.34 at Duayaw Nkwanta market which shows a moderate spatial integration of 34 percent compared to the perfect integration threshold of 100 percent indicated by Lohano and Mari (2012). Additionally, the result depicts that plantain wholesale real prices at Kenyasi market have significant effects on wholesale real prices for plantain at Duayaw Nkwanta market.

These results imply that in the long-run the plantain market at Kenyasi is co-integrated with that at Duayaw Nkwanta which means that besides transportation and transactions costs, there will be relatively moderate variation in prices between the two markets and between any two different times. This suggests that the markets may be efficient since market integration has been used as a measure of market efficiency (Acquah & Owusu, 2012). The result could be attributed to the fact that Duayaw Nkwanta market is relatively near to Kenyasi market and is easily accessed by plantain traders who are able to respond to the variation in prices by supplying more plantain to Kenyasi market.

While it may be easy for Duayaw Nkwanta market traders to adjust to the negative price shock, it is likely to be detrimental for farmers to adjust their price and this may eventually discourage them from increasing plantain production in the attempt to reduce poverty. This is illustrated by the conceptual framework for the study which indicates that market integration of the food produce market is necessary for prices to give favourable signals that inform the production and marketing decisions of farmers for increased food production and poverty reduction. Abankwah et al. (2013) note that even

though marketing efficiency benefits overall welfare, in an efficient marketing system, traders may benefit at the expense of farmers or vice versa.

The Duayaw Nkwanta on Techiman regression for plantain market prices yielded a market integration parameter, λ value of 0.38 (38%) with a negative sign and is significant at 1 percent level (p-value = 0.00). This implies that with an increase in plantain price of GH¢1.00 at Techiman, a reduction of GH¢0.38 will happen at Duayaw Nkwanta market and this shows a moderate market integration compared to the threshold of 100 percent usually applied (Nkendah & Nzouessin, 2006). Moreover, the significant effects of Techiman prices on Duayaw Nkwanta prices indicate that the plantain wholesale market in Techiman is co-integrated with the Duayaw Nkwanta plantain wholesale market in the long-run.

The result may be due to the good information flow between the two markets at Techiman and Duayaw Nkwanta. The conceptual framework indicates that information flow between food crop farmers and their traders enables exchange to take place and enhances market efficiency. Another reason may be the good transportation system linking the two markets that facilitates the easy access of plantain traders to the markets for them to take advantage of arbitrage opportunities. This is consistent with the agricultural marketing theory which postulates that changes in supply and demand conditions in one market will affect prices in other markets until equilibrium is restored through spatial arbitrage (Rapsomanikis et al., 2003). The finding supports the observation by Acquah and Owusu (2012) that plantain markets in Ghana are integrated in the long-run and that the markets may be efficient.

The regression results for Techiman on Kenyasi and Techiman on Duayaw Nkwanta plantain market prices showed positive but very low market integration parameter values (4% and 3% respectively) and were not significant. This implies that there is minimal effect of plantain prices at Kenyasi and Duayaw Nkwanta on Techiman plantain prices and signifies weak integration of the markets involved compared to the perfect integration threshold of 100 percent (Lohano & Mari, 2012).

The reason for the insignificant market integration could be that Techiman plantain market is very big with large numbers of participants and as such small changes in Kenyasi or Duayaw Nkwanta prices are not likely to have significant effect on the prices at the bigger market. The implication is that the markets may send inaccurate price signals which may cause farmers to make wrong marketing decisions and traders may exploit the market and benefit at the expense of farmers. This suggests that market integration plays an important role in influencing farmers' production and marketing decisions for increased food production and poverty reduction as indicated in the conceptual framework. For instance, Mensah-Bonsu et al. (2011) have noted that linkages to marketing centres contribute considerably to farm household's escape from poverty.

As evident in Table 24, the regression results for tomato markets indicate that the estimated market integration parameter value of λ varies between 0.00 and 0.47 where the lowest (0.00) is found in Kenyasi on Techiman regression. The highest (0.47) is in the regression of Duayaw Nkwanta on Techiman. The regression results of Duayaw Nkwanta on

Kenyasi and Duayaw Nkwanta on Techiman market prices for tomato showed negative market integration parameters of 0.45 (45%) and 0.47 (47%) respectively and were both significant at 1 percent level. This implies that there is significant effect of tomato prices at both Kenyasi and Techiman markets on Duayaw Nkwanta tomato prices and signifies moderate integration of the market pairs compared to the perfect integration threshold of 100 percent indicated by Nkendah and Nzouessin (2006).

This may mean that the two pairs of tomato markets are efficient in line with the agricultural marketing theory that suggests that spatial market integration can measure the efficiency of marketing systems (Acquah & Owusu, 2012). The efficiency of the markets may be explained by the fact that both Kenyasi and Techiman are linked by good transportation systems to Duayaw Nkwanta which facilitates the movement of tomato into the markets. Moreover, the recent expansion in communication infrastructure may be helping in sending market information which stimulates the market integration (Maxim, 2009).

With the integrated markets, it implies that tomato farmers are likely to engage in production activities that bring in maximum farm profits and consumers may pay lower prices for food produce. This is inherent in the conceptual framework for the study that emphasises the necessity for market integration in the food produce market for it to give favourable signals to inform the production and marketing decisions of farmers for increased food production and poverty reduction. The finding is similar to that of a study by Shrestha et al. (2014) in Nepal in which long-run market integration was

obtained with negative price shocks deviation in tomato and the market was found to be efficient.

The results for tomato markets also show that Techiman on Duayaw Nkwanta and Techiman on Kenyasi regressions yielded market integration parameter values of -0.32 (32%) and -0.26 (26%) respectively. Each of the parameter values is with a p-value of 0.00 which is significant at 1 percent level. Therefore, tomato wholesale real prices at Duayaw Nkwanta and Kenyasi markets have negative and significant effects on wholesale real prices for tomato at Techiman market. This implies that in the long-run each of the tomato markets at Duayaw Nkwanta and Kenyasi is co-integrated with the Techiman market which may signify that the tomato markets are efficient.

This result is in contrast to what pertains in plantain markets at same market locations where the smaller markets at Duayaw Nkwanta and Kenyasi have minimal effects on plantain prices at the bigger Techiman market. The explanation for the difference may be that in the case of the tomato markets, farmers as well as traders may be better organised and share information better than farmers and traders in the plantain markets. This is consistent with the conceptual framework of the study which emphasises the need for information flow in ensuring market integration. The finding supports Alam and Begum's (2007) observation that every produce displays a unique price relationship between spatially separated markets because each has a unique marketing system.

In further analysis, the results point to weak spatial market integration between Kenyasi and Techiman markets (26%) but a slightly stronger one

between Duayaw Nkwanta and Techiman markets (32%), in relation to the threshold of 100 percent as indicated by Nkendah and Nzouessin (2006). The difference between the market integration of the two market pairs could be attributed to the fact that Duayaw Nkwanta market is on a main highway linking Techiman and Kumasi and may have easier accessibility than Kenyasi market which is on a branch route.

The degree of spatial integration between plantain as a less perishable staple and tomato as a more perishable vegetable was computed and compared. Following Lohano and Mari (2012), the deviation from perfect spatial integration was determined as the absolute value of the difference between 1 and the estimated value of the market integration parameter. The average value of the deviations in plantain markets was found to be 0.83 (83%) while that in tomato markets was 0.74 (74%).

The findings of the analysis indicate that both plantain and tomato markets are weakly integrated spatially with an overall degree of integration in plantain and tomato markets of 17 percent (100-83%) and 26 percent (100-74%), respectively. However, the overall degree of integration in tomato markets is relatively stronger than in plantain markets. This difference may be attributed to better market information flow among the tomato markets than plantain markets. For instance, in a related study Ngeleza and Robinson (2011) observe that trader associations for the various produce types such as plantain and tomato are formed primarily to disseminate market information, among other objectives.

Furthermore, it was found from the study in an earlier analysis under objective one that more tomato farmers (42.9%) belong to an FBO as compared to the plantain farmers (23.9%) which suggests better market information sharing among the tomato farmers. The result is similar to the findings of studies by some researchers including Lohano and Mari (2012), Adeoye, Dontsop, Amao and Fajimi (2013) and Shrestha et al. (2014). The researchers have concluded that markets of perishable vegetables such as tomato have stronger market integration in the long-run than less perishable food produce.

Having demonstrated that market integration is present in the price relationships of plantain and tomato markets, it is important to analyse the speed of adjustment. This is in order to understand the extent to which the markets are integrated in the short-run. Ghafoor et al. (2009) have noted that price adjustment across markets may not happen instantaneously but may take some time for spatial price adjustments to occur. The speed of adjustment thus represents the speed by which long-run disequilibria are corrected or prices adjust to their long-run relationships. The results in Table 23 also show the estimates of adjustment parameter β_1 which represents the speed of adjustment to long-run equilibrium. When β_1 is close to 1, the speed of adjustment to long-run equilibrium is very slow. When β_1 is close to 0, the speed of adjustment is very fast (Lohano & Mari, 2012).

The speed of adjustment estimates for plantain markets vary from 0.01 to 0.39 and are quite close to zero. This suggests that the speed of adjustment to the long run equilibrium is relatively fast for plantain markets. The result

implies that plantain traders may be able to take advantage of price shocks while plantain farmers may have to contend with low prices in negative price shocks since they may have already harvested or are about to harvest the produce for the market. However, all the speed of adjustment estimates have the wrong sign (positive) which, according to Acquah and Owusu (2012), indicates that the short-run price movements along the long-run equilibrium path may be unstable.

The results also show that it is only the speed of adjustment estimates for Duayaw Nkwanta on Kenyasi and Kenyasi on Duayaw Nkwanta regressions that were significant at 5 percent alpha level. The significant speed of adjustment estimates for the two pairs of plantain markets may be due to the closeness of the markets which facilitate quicker market information flow. Thus, overall, the speed of adjustment for the plantain markets indicate weak short-run integration since, according to Shrestha et al. (2014), prices are cointegrated when estimated speed of adjustment is negative and statistically significant.

The estimated speed of adjustment for tomato markets varies from 0.08 to 0.70 where only the highest (0.70) is above 0.36. The overall estimated speed of adjustment to the long run equilibrium being close to zero suggests that it is relatively fast for tomato markets, as indicated by Lohano and Mari (2012), in spite of the weak integration in the long-run. This is corroborated by the finding of Ihle and Amikuzuno (2009) that tomato prices in net producing areas of Ghana adjust quickly to disequilibria and attributed it to good information exchange among farmers.

In further analysis, the results reveal that the speed of adjustment estimate for Duayaw Nkwanta on Techiman regression is significant at 1 percent level. The regressions of three other pairs of tomato markets namely, Kenyasi on Techiman, Techiman on Duayaw Nkwanta and Techiman on Kenyasi are significant at 5 percent alpha level. This suggests that there may be good market information flow between the market pairs due to the likely membership of tomato farmers in farmer-based organisations.

Additionally, the results show that each of the speed of adjustment estimates has a wrong sign (positive) which indicates that price movements in the short-run may be unstable as prices adjust to their long-run relationships. This implies that even though the overall estimated speed of adjustment is relatively fast and most of the speed of adjustment estimates are significant, the short-run market integration for the tomato markets may be moderate. This is in accordance with Shrestha et al.'s (2014) assertion that prices are co-integrated when estimated speed of adjustment is negative and statistically significant.

The implication is that price transmission in the tomato market may be fast enough for farmers to take timely production and marketing decisions and increase farm profits. For instance, Acquah et al. (2012) have stated that shorter time lapse for long-run price transmission to be complete is better, since longer time lapse sends out inaccurate price signals that might mislead farmers in their marketing decisions. This supports the proposition that spatial market integration sends signals that facilitate farmer production and marketing decisions to increase food production and farm incomes and reduce

poverty, as shown in the conceptual framework of the study. The finding confirms the claim of Ankamah-Yeboah (2012) that the more integrated a market is in the short- and long-run, the more efficient it is since it tends to be more competitive.

The results mean that there exist both long-run and short-run market integration among plantain markets and also among tomato markets in the Brong Ahafo Region of Ghana. While the long-run market integration for both plantain and tomato markets were found to be weak, the overall degree of integration in tomato markets is relatively stronger than in plantain markets. The speed of adjustment to the long-run equilibrium was found to be relatively fast for both plantain and tomato markets. However, the sign and the significance of the speed of adjustment pointed to weak short-run integration for the plantain markets and moderate for the tomato markets. This indicates that food produce markets represented by plantain and tomato were spatially integrated. Therefore, the null hypothesis that food produce markets in the three districts were not spatially integrated was rejected.

Relationship Quality Analysis

Relationship quality has been found to be useful and appropriate in situations where good interpersonal relationship and trust are needed in market relationships such as in food produce marketing (Vieira et al., 2008). This makes it necessary to analyse the quality of the relationship between food produce farmers and traders to ascertain how much the behaviours of these food produce channel or value chain members contribute to the efficiency of the food produce marketing system. It is informed by relationship marketing

theory which postulates that customers and sellers are long term partners in an exchange process based on trust and rooted in the marketing concept (Murphy et al., 2006).

Relationship quality could be assessed from the perspective of either traders or farmers or both. Palmatier (2008) has noted that since the party which initiates the relationship has its own expected goals, a one-way perspective focusing on the implementer is expected and even relevant. Even though buyer or customer only perspectives have characterised the approaches that have been used in assessing relationship quality (Vieira et al., 2008), in this study, it was considered from farmer or seller only perspective. This was to enable the determination of the relationship quality between food produce farmers and traders and, in keeping with the essence of objective three of this study, know how it provides an incentive for farmers' decision to produce more.

In addressing objective three of the study which sought to explore the factors that define the relationship between farmers and traders in the food produce marketing channel in the Brong Ahafo Region, exploratory factor analysis was employed. Respondents were asked to give their perceptions on 19 related statements to ascertain the factors that define the quality of relationship between farmers and traders.

Statements measuring the quality of relationship between farmers and traders were composed using the Likert scale with a scale of 1 to 5 where 1 = very low, 2 = low, 3 = fairly high, 4 = high and 5 = very high. Several tests were done to examine the suitability of the data measuring quality relationship

between farmers and traders for factor analysis. The analysis was done on the perceptions of the relationship quality of tomato and plantain farmers with their traders separately for comparison, beginning with that of the tomato farmers and their traders.

Relationship Quality from Tomato Farmers' Perspective

Reliability test was first conducted to test the agreement among the items. The Cronbach alpha result of about 0.74 was above the minimum adequate value of 0.7 (Hair, Black, Babin & Anderson, 2010), which implies that there is internal consistency among the items. Pearson correlation was also employed to ascertain the existing relationship among the battery of items measuring the quality of relationship between farmers and traders. The results from the correlation matrix show that there is some significant relationship among the items which implies that correlations are not due to chance.

An average inter-item covariance of 0.14 and a scale reliability coefficient of 0.74 were obtained from a reliability test on the 19 items in the scale. Further tests were employed to test the degree to which the correlation matrix differs from an identity matrix and the measure of common variance or communality respectively. The results obtained from the KMO's measure of sampling adequacy (0.935) and Bartlett's test of sphericity (p -value=0.000) imply that exploratory factor analysis can be used to ascertain the relationship between tomato farmers and their traders (Yong & Pearce, 2013). As a result, orthogonal varimax rotation was applied to analyse the factors. The model also recorded p -value of 0.0000 which implies that the model is statistically significant at 1 percent significance level.

Table 26 contains the factor loadings without rotation. It shows the variation among the battery of items explaining the relationship between tomato farmers and their traders. Eight factors with eigenvalues above 1 were retained following the eigenvalue-one rule as applied by Boniface et al., (2009). The results also show that about 77.2 percent of the variation in the relationship between tomato farmers and their traders was explained by the eight extracted factors with the first factor explaining 19.9 percent, followed by the second factor with 12.3 percent and third factor also explaining about 11 percent.

Table 26: Unrotated Factor Analysis - Tomato Farmers' Perspective

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	3.777	1.44386	0.1988	0.199
Factor2	2.333	0.25099	0.1228	0.322
Factor3	2.082	0.46203	0.1096	0.431
Factor4	1.620	0.17025	0.0853	0.516
Factor5	1.450	0.15307	0.0763	0.593
Factor6	1.297	0.19729	0.0682	0.661
Factor7	1.099	0.09465	0.0579	0.719
Factor8	1.005	0.02771	0.0529	0.772
Factor9	0.977	0.284	0.0514	0.823
Factor10	0.693	0.05686	0.0365	0.860
Factor11	0.636	0.19254	0.0335	0.893
Factor12	0.444	0.04038	0.0233	0.916
Factor13	0.403	0.02621	0.0212	0.938
Factor14	0.37693	0.04658	0.0198	0.9574
Factor15	0.33035	0.14769	0.0174	0.9748
Factor16	0.18265	0.05874	0.0096	0.9844
Factor17	0.12391	0.02978	0.0065	0.9909
Factor18	0.09413	0.01619	0.005	0.9959
Factor19	0.07794	.	0.0041	1

Number of obs = 42

Retained factors = 8

LR test: independent vs. saturated

Prob>chi2 = 0.0000

chi2(171) = 321.47

Source: Field survey (2016)

A scree plot of eigenvalues after factor rotation in Figure 11 confirmed the findings of retaining eight factors that were above 1.

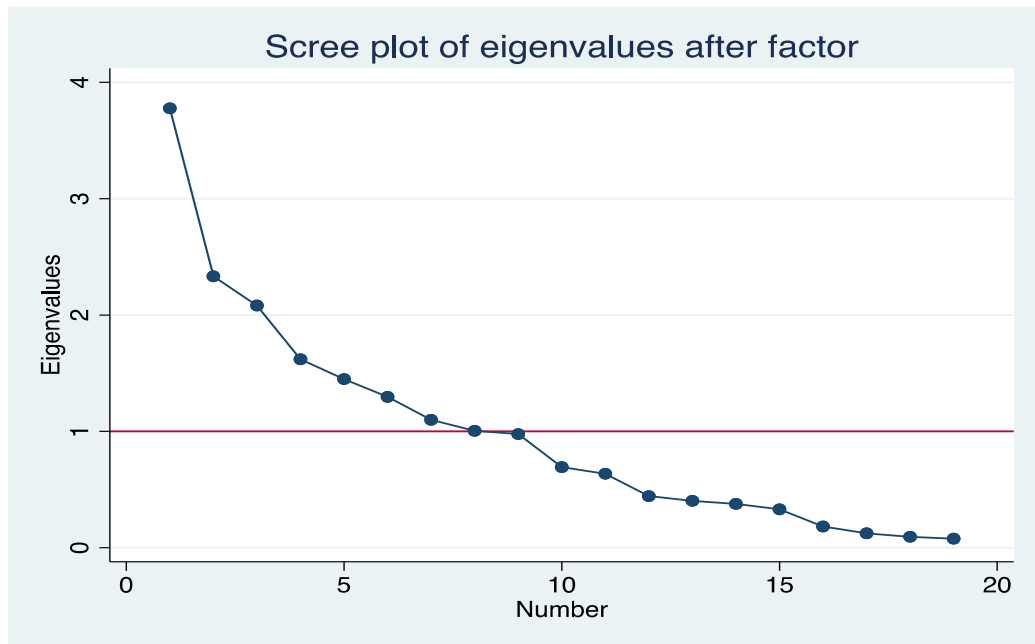


Figure 11: Scree Plot of Eigenvalues after Factor Rotation

Source: Field survey (2016)

The results of the factor loadings without rotation can be ambiguous in explaining the relationship between tomato farmers and their traders. As a result, varimax rotation was applied to enhance the factor loadings by maximizing the number of high loadings on each variable for better interpretation (Tabachnick & Fidell, 2007). Table 27 shows the factor loadings after rotation using the orthogonal varimax rotation which retained eight factors that explain a cumulative variation of 77.2 percent in the quality of the relationship between tomato farmers and their traders.

Table 27: Factor Analysis with Orthogonal Varimax Rotation - Tomato Farmers' Perspective

Factor	Variance	Difference	Proportion	Cumulative
Factor1	2.297	0.023	0.121	0.1209
Factor2	2.274	0.240	0.120	0.2406
Factor3	2.034	0.243	0.107	0.3477
Factor4	1.791	0.194	0.094	0.4419
Factor5	1.597	0.031	0.084	0.526
Factor6	1.566	0.012	0.082	0.6084
Factor7	1.553	0.005	0.082	0.6901
Factor8	1.54877	.	0.082	0.7717

Number of obs = 42

Retained factors = 8

LR test: independent vs. saturated

Prob>chi2 = 0.0000

chi2(171) = 321.47

Source: Field survey (2016)

Table 28 also gives the rotated factor loadings (pattern matrix) and unique variances where all elements with factor loadings above 0.5 were retained as suggested by Field (2009). Factor 1 explains 12.1 percent variation in the relationship between tomato farmers and their traders. Factor 1 is based on the following four elements: continuation with old traders despite cheating, enjoying relationship with the major traders, payment on time, and assurance that the price received depend on the quality of tomato.

From the foregoing, Factor 1 implies that there is commitment among tomato farmers and their traders in their dealings, hence, Factor 1 is named “Commitment”. Vieira et al. (2008) identified commitment as a key dimension of relationship quality as captured by relationship marketing theory. The conceptual framework of the study also shows that commitment is one the dimensions of relationship quality besides trust and satisfaction which influences spatial market integration.

Table 28: Rotated Factor Loadings (Pattern Matrix) and Unique Variances - Tomato Farmers' Perspective

Elements	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8
Continuation with old ones despite cheating	0.829							
Enjoy relationship with the major traders	0.544				0.654			
Our relationship is something that we are very committed to		0.655						
I care about the long-term success of the relationship with my buyer			0.906					
I receive payment on time	0.779							
I believe the market prices and other information provided by my buyer		0.706						
I find my buyers reliable in terms of having enough capital								0.895
Regarding the price I receive, my buyer does not seem to take advantage on me								0.553
My buyer will act and negotiate fairly even if the possibility of cheating exists					0.904			
My buyer is flexible to change order (prices and quantities) whenever I make the request								0.865
In comparison to other buyers, I am satisfied with the price my buyer offers		0.682						
The buyer always communicates properly if the price changes					0.768			
The prices I received from my buyer are similar to the prices other farmers get							0.865	
I know that the price I received depend on the quality of my tomato	0.553							
Based on prices my buyer offers me, I will not change buyers			0.611					0.561
My buyer deals with me as expected		0.650						
My buyer is quick to handle my complains					0.764			

Source: Field survey (2016)

Factor 2 which explains 12 percent of the variation in the relationship between tomato farmers and their traders is based on four elements. These include commitment to the relationship, believing in the market prices and other information provided by traders, being satisfied with the price that buyers offer, and being convinced that traders deal with them as expected. Based on the elements retained, Factor 2 implies that there exists some trust among tomato farmers and their traders in their dealings. Factor 2 is therefore named “Trust”. This is consistent with the claim that trust has a considerable influence on the success of relationship marketing (Hunt et al., 2006) as suggested by the conceptual framework of this study.

Factor 3 explains 10.7 percent of the variation in the relationship between tomato farmers and their traders. Factor 3 is hinged on two elements which are the care about the long-term success of the relationship with traders and the decision made not to change traders based on prices the traders offer. From the elements highlighted above, Factor 3 was named “Loyalty”.

Factor 4 (9.4%) is also explained by two elements, namely, enjoying the relationship with the major traders and believing that traders will act and negotiate fairly even if the possibility of cheating exists. Elements from Factor 4 imply the adequacy of satisfaction from intangible benefits and hence the factor was named “Non-economic satisfaction”. As illustrated in the conceptual framework, relationship quality which contributes to spatial integration has one of its key dimensions as satisfaction. In this regard, Batt (2003) observed that satisfaction has a direct influence on farmers’ desire to

maintain their relationship with their traders and this may be economic or non-economic satisfaction as classified by Sahara et al. (2013).

Factor 5 explains 8.4 percent of the variation in the relationship between the tomato farmers and their traders and is based on two elements. These are the certainty that the traders always communicate to the farmers properly if the price changes and the assertion that traders are quick to handle farmers' complaints. Therefore, Factor 5 is hinged on the adequacy of information flow hence was named "Communication".

Communication has been found to be a major precursor of trust (Palmatier, 2008), which combines with commitment to represent the key factors that promote market efficiency as shown in the conceptual framework. For instance, in a study on the German pork sector, Schulze and Spiller (2006) found that communication had a significant impact on the development of trust. The recent expansion in communication infrastructure such as the use of mobile phones (Maxim, 2009) may be facilitating the communication between the tomato farmers and their traders.

Factor 6 (8.2%) is hinged on one element which is farmers' self-assurance that the prices they receive from their traders are similar to the prices other farmers get. The element explaining Factor 6 is hinged on the adequacy of tomato farmer's contentment towards the price offered them by their traders and is therefore named "Economic satisfaction". Economic satisfaction is incorporated in satisfaction which is suggested in the conceptual framework as a key dimension of relationship quality with the potential to

enhance spatial market integration and market efficiency through the reduction of transaction costs (Foundjem-Tita et al., 2012).

Factor 7 also explains 8.2 percent of the variation in the relationship between tomato farmers and their traders. Factor 7 is mostly defined by two elements which are farmers' claim that their traders do not seem to take advantage of them when it comes to the prices traders give them and the assertion that traders are flexible to change order prices and quantities whenever farmers make the request. Factor 7 is largely based on value of relationship hence it is named "Relational value". Relational value has been identified as a determinant of relationship quality by Vieira et al. (2008). The conceptual framework of the study indicates that relationship quality is important in boosting spatial market integration and consequently market efficiency. Thus relational value may influence relationship quality and market efficiency in the food produce marketing system.

Factor 8 also explains 8.2 percent of the variation in the variation in the relationship between tomato farmers and their traders. It comprises two elements, which are farmers' claim that their traders are reliable in terms of having enough capital and the decision taken by farmers not to change traders based on prices their traders offer them. Hence, it is mostly defined by financial strength of the buyer and price satisfaction hence it is named "Domain expertise". Parsons (2002) indicates that domain expertise is a determinant of relationship quality and therefore has an influence on trust, commitment and satisfaction which are key dimensions of relationship quality

that are suggested by the conceptual framework as important for enhancing spatial integration in the food produce marketing system.

From the exploratory factor analysis, it was revealed that commitment, trust, loyalty, non-economic satisfaction, communication, economic satisfaction, relational value and domain expertise are the main factors that explain the relationship between tomato farmers and their traders in order of their importance. The three main dimensions of relationship quality of commitment, trust and satisfaction that are captured in the conceptual framework have all been identified in the findings.

The findings are in line with the relationship marketing theory which advances that customers and sellers are long term partners in an exchange process based on trust (Murphy et al., 2006). The relationship between tomato farmers and their traders is characterised by trust and other attributes of long term relationships such as commitment, loyalty and satisfaction which keep them together as long term partners in the food produce marketing system. Furthermore, the result of the analysis showing a cumulative variation of 77.2 percent in the quality of the relationship between tomato farmers and their traders indicates an overall good quality of the relationship.

Moreover, the results showing commitment and trust as the first two topmost factors that define the relationship between tomato farmers and traders is consistent with the assertion of Hunt et al. (2006) that trust and commitment are considered to be the most influential factors in the success of relationship marketing. The results are also consistent with findings from other studies, including that by Gyau and Spiller (2008) who found high levels of

trust, but moderate levels of commitment, general satisfaction and satisfaction with price from chili farmers' perspective of their relationship with traders. However, Foundjem-Tita et al. (2011) concluded that farmers' commitment to continue the partnership is not related to relationship satisfaction and trusts but based on other strategic reasons like reducing transaction costs.

Non-economic satisfaction of 9.4 percent (4th factor) and economic satisfaction of 8.2 percent (6th factor) which together describe relationship satisfaction suggests that, generally, tomato farmers are satisfied to some extent with the relationship they have with the traders. Furthermore, the results indicate that tomato farmers are more satisfied with non-price or non-economic aspects of their relationship than the price or economic aspect. The results also show that communication influences the tomato farmer's perception of relationship quality more than price.

The above finding is similar to findings of Gyau, Spiller and Wocken (2011) in a study of the German dairy industry that behavioural norms rather than prices paid to the farmers was the most important factor which influenced the quality of the relationship of farmers with their buyers. Generally, the analysis has shown a link between the conceptions of the relationship marketing theory and the spatial market integration concept as illustrated in the conceptual framework towards enhancing tomato market efficiency.

Relationship Quality from Plantain Farmers' Perspective

In order to analyse the relationship quality between plantain farmers and their traders, reliability test was first applied to test the agreement among the items. A Cronbach alpha of 0.72 was obtained, implying that that there is

internal consistency among the items (Hair et al., 2010). Pearson correlation was also employed to ascertain the existing relationship between the series of items measuring the quality of relationship between the plantain farmers and traders. The correlation matrix results indicate that there is some significant relationship among the items which means that correlations are not due to chance.

The degree to which the correlation matrix differs from an identity matrix and the measure of common variance or communality were tested using Bartlett's test of sphericity and Kaiser-Meyer-Olkin measure of sampling adequacy (KMO) test respectively. The results indicate a scale reliability coefficient of 0.72 and an average interitem covariance of 0.85. The KMO measure of sampling adequacy result of 0.892 and Bartlett's test of sphericity result of $p=0.000$ indicate that exploratory factor analysis can be used to analyse the relationship between plantain farmers and their traders (Yong & Pearce, 2013).

Table 29 shows the factor loadings without rotation. The table depicts the variation among the series of items explaining the relationship between plantain farmers and their traders. Using an eigenvalue cut-off of 1.0, as recommended by Costello and Osborne (2005), there were three factors that explained a cumulative variance of 60.8 percent. The results further show that the first factor explained 0.477 (47.7%), followed by the second factor with 0.072 (7.2%) and the third factor explaining 0.059 (5.9%) of the variation in the relationship between plantain farmers and their traders.

Table 29: Unrotated Factor Analysis - Plantain Farmers' Perspective

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	9.057	7.682	0.477	0.477
Factor 2	1.375	0.253	0.072	0.549
Factor3	1.122	0.191	0.059	0.608
Factor4	0.931	0.112	0.049	0.657
Factor5	0.820	0.012	0.043	0.700
Factor6	0.807	0.111	0.043	0.743
Factor7	0.696	0.066	0.037	0.779
Factor8	0.631	0.052	0.033	0.813
Factor9	0.579	0.059	0.031	0.843
Factor10	0.520	0.037	0.027	0.870
Factor11	0.483	0.076	0.025	0.896
Factor12	0.408	0.095	0.022	0.917
Factor13	0.312	0.024	0.016	0.934
Factor14	0.288	0.010	0.015	0.949
Factor15	0.278	0.050	0.015	0.964
Factor16	0.228	0.036	0.012	0.976
Factor17	0.192	0.041	0.010	0.986
Factor18	0.151	0.030	0.008	0.994
Factor19	0.121	.	0.006	1.000
Number of obs = 92				
Retained factors = 3				
LR test: independent vs. saturated				
Prob>chi2 = 0.0000				
chi2(171) = 1044.61				

Source: Field survey (2016)

Orthogonal varimax rotation was applied to have each variable load on as few factors as possible and thereby increase the number of high loadings on each variable, as suggested by Field (2009). This enables better interpretation of the relationship between plantain farmers and their traders. The scree plot

of eigenvalues after factor rotation in Figure 12 confirmed the findings of retaining three factors.

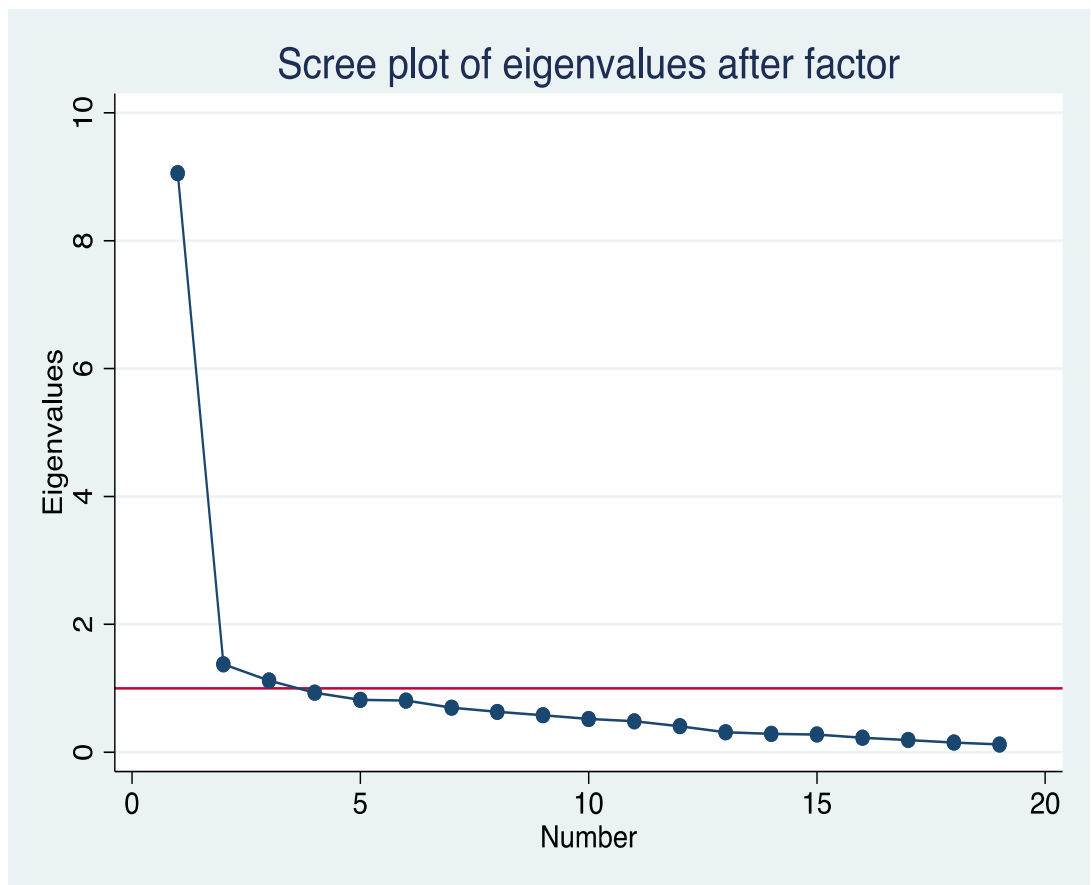


Figure 12: Scree Plot of Eigenvalues after Factor Rotation - Plantain Farmers' Perspective

Source: Field survey (2016)

Table 30 contains the factor loadings with varimax rotation which retained three factors that explain a cumulative variation of 0.608 (60.8%) in the quality of the relationship between plantain farmers and their traders. Factor 1 explains 23.8 percent of the quality of the relationship between plantain farmers and their traders, while Factors 2 and 3 explain 22.2 percent and 14.8 percent respectively. The model also recorded a p-value of 0.0000

which implies that the model is statistically significant at 1 percent significance level.

Table 30: Factor Analysis with Orthogonal Varimax Rotation – Plantain Farmers’ Perspective

Factor	Variance	Difference	Proportion	Cumulative
Factor1	4.527	0.312	0.238	0.238
Factor2	4.215	1.402	0.222	0.460
Factor3	2.813	.	0.148	0.608

Number of obs = 92

Retained factors = 3

LR test: independent vs. saturated

Prob>chi2 = 0.0000

chi2(171) = 1044.61

Source: Field survey (2016)

Table 31 shows the factor loading and unique variances using a significant loading cut-off of 0.5 to reduce cross-loadings and aid interpretation (Tabachnick & Fidell, 2007).

Table 31: Rotated Factor Loadings (Pattern Matrix) and Unique Variances – Plantain Farmers’ Perspective

Variable	Factor1 Commitment	Factor2 Satisfaction	Factor3 Trust	Uniqueness
Continuation with old ones despite cheating			0.720	0.476
I would not sell to other traders because I like being associated with my buyer	0.836			0.232
Our relationship is something that we are very committed to	0.767			0.320
I care about the long-term success of the relationship with my buyer	0.795			0.229
I receive payment on time		0.532		0.3694
I believe the market prices and other information provided by my buyer		0.630		0.3791
I find my buyers reliable in terms of having enough capital			0.737	0.3204
Regarding the price I receive, my buyer does not seem to take advantage on me		0.670		0.421
My buyer will act and negotiate fairly even if the possibility of cheating exists		0.668		0.4694

Table 31 continued

My buyer is flexible to change order (prices and quantities) whenever I make the request			0.531	0.3741
In comparison to other buyers, I am satisfied with the price my buyer offers	0.559	0.559		0.3752
The buyer always communicates properly if the price changes		0.832		0.2474
The prices I received from my buyer are similar to the prices other farmers get	0.679			0.423
I know that the price I received depend on the quality of my plantain		0.5434		0.4231
Based on prices my buyer offers me, I will not change buyers	0.5795			0.3969
My buyer deals with me as expected	0.5964	0.5563		0.2686
My buyer is quick to handle my complains			0.6022	0.4574

Source: Field survey (2016)

Factor 1 is found to be based on seven elements including farmers' decision not to sell to other traders because they like being associated with their traders, and farmers' assertion that their relationship with traders is something that they are very committed to. Other elements are farmers' claim that they care about the long-term success of the relationship with their traders, and being satisfied with the price their traders offer them as compared to what other traders offer.

The list of elements that Factor 1 is found to be based on also comprised being satisfied with the prices traders offer, and the self-assurance that the prices they receive from their traders are similar to the prices other farmers get. The remaining elements are farmers' resolve not to change traders because of the prices their traders offer them, and being certain that traders deal with them as expected. These signify a level of commitment among the plantain farmers and their traders and thus Factor 1 is named "Commitment".

According to relationship marketing theory, commitment which concerns with the desire of a firm to maintain a long-term relationship with its customers, is an important dimension of relationship quality (Nwakanma & Jackson, 2007). This is illustrated in the conceptual framework of the study which shows that commitment, as a dimension of relationship quality, is necessary in improving spatial market integration of the food produce market.

Factor 2 is based on eight elements among which include receiving payment on time, and believing in the market prices and other information provided by traders. Farmers' believe that traders do not seem to take advantage of them with regards to the prices they receive, as well as being certain that traders will act and negotiate fairly are among the elements that inform Factor 2. Additionally, the claim that traders always communicate properly if the price changes, and being certain that the price they receive depend on the quality of their plantain are among the list of elements used. The remaining elements are the satisfaction they have about the price that traders offer when compared to what other traders offer, and the confidence that their traders deal with them as expected.

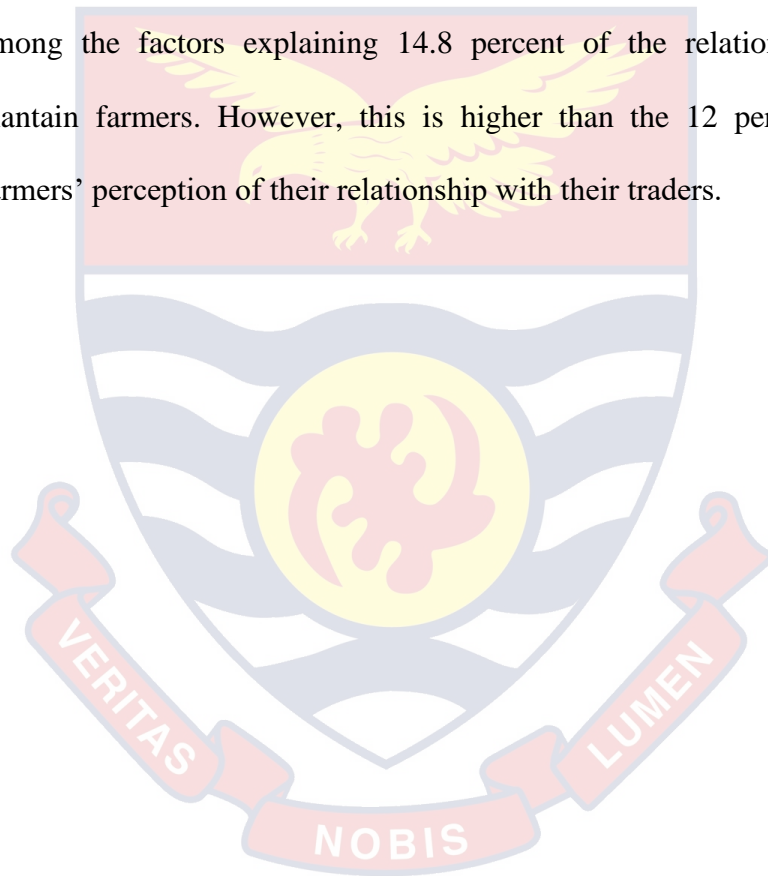
Overall, the elements imply that there is the assurance of a good performance that plantain farmers perceive of their traders in the future as a result of a consistently satisfactory past performance (Vieira et al., 2008), both in terms of price and intangible benefits. This is consistent with Sahara et al.'s (2013) classification of relationship satisfaction into economic and non-economic satisfaction. Consequently, Factor 2 is named "Satisfaction". The conceptual framework of the study identified the influence of satisfaction as a

key dimension of relationship quality towards improving spatial market integration and the efficiency of the food produce market.

Factor 3 is explained by four key elements which are the decision to continue with old traders despite cheating, and the claim that traders are reliable in terms of having enough capital. Moreover, perceiving traders to be flexible to change order (prices and quantities) whenever the request is made, and asserting that traders are quick to handle their complaints are other elements considered. Altogether, the elements portray a sense of confidence plantain farmers have in the reliability and integrity of their traders, hence Factor 3 is named “Trust”. Nwakanma and Jackson (2007) assert that trust is a key element for successful relationship marketing that is capable of boosting market efficiency as suggested by the conceptual framework of this study.

The main factors that explain the quality of the relationship between plantain farmers and their traders, as discovered from the exploratory factor analysis, are commitment, satisfaction and trust in order of importance. This seems to confirm the assertion by Vieira et al. (2008) that these three variables are the building blocks of relationship quality which the conceptual framework indicates as the main components of relationship quality. This is also inherent in the relationship marketing theory which espouses that customers and sellers are long term partners in an exchange process based on trust and rooted in the marketing concept (Murphy et al., 2006). The result of the analysis also shows a cumulative variation of 60.8 percent in the quality of the relationship between plantain farmers and their traders which indicates an overall good quality of the relationship.

The results further indicate that commitment explains 23.8 percent which signals a higher commitment level in the relationship that plantain farmers have with their traders than the level of commitment (12.1 percent) of the tomato farmers with their traders. Similarly, satisfaction explaining 22.2 percent suggests that generally plantain farmers are better satisfied with the relationship they have with their traders than the case of their tomato farmer counterparts with a combined satisfaction variation of 17.6. Trust is the least among the factors explaining 14.8 percent of the relationship quality of plantain farmers. However, this is higher than the 12 percent for tomato farmers' perception of their relationship with their traders.



CHAPTER EIGHT

EFFECTS OF MARKETING ON FOOD CROP FARMERS'

PRODUCTION DECISIONS

Introduction

The chapter provides the analysis of the effects of market efficiency on the production decisions of food produce farmers. The conceptual framework for the study indicates that the agricultural household applies resources such as land, labour and other socio economic issues including the influence of the food produce market, to decide how to maximise its profit in terms of food production and poverty reduction.

The chapter discusses the household decision making in the context of plantain and tomato production based on the household decision making theory and the risk theory. It dwells on inferential statistics to analyse the issues based on responses from a sample of 269 farmers from the three districts of Techiman Municipality, Tano North and Asutifi South who participated in the study.

Household Food Production Decision Making

Farmers are known to make decisions concerning such issues as what to produce, input use, harvest and post-harvest of food produce which affect production, processing, distribution, prices and costs (William, 2003). However, as noted by Koppelman and French (2005), it is at the agricultural household level that all farm decisions are made. The agricultural household thus operates as a system of resource allocation in a manner that will maximise its utility function (Donnellan & Hennessy, 2012). Tiberti and

Tiberti (2015) observe that the household faces constraints that include natural, technological, social and market factors when making resource allocation decisions to maximize utility. Thus, with the focus of this study, the factors that influence the decision of farmers to produce plantain or tomato were examined.

Probit regression was used to determine the factors that influence farmers' decision to cultivate plantain or tomato for marketing. Robust regression was run to ensure that efficient and unbiased estimates were produced. The marginal effects of the probit regression are presented in Table 32. The models for tomato production and plantain production were statistically significant in explaining the relationship between the regressors and decision to produce tomato or plantain for marketing.

Table 32: Factors Influencing the Decision of Farmers to Produce Crop for Marketing

Variable	Tomato			Plantain		
	dy/dx	SE	P> z	dy/dx	SE	P> z
Sex(male)	0.101**	0.051	0.048	-0.064	0.078	0.411
Age	-0.010	0.012	0.411	0.043***	0.016	0.007
Age2	0.000	0.000	0.652	0.000***	0.000	0.010
HHsize	0.008	0.007	0.241	-0.018**	0.009	0.051
HHead	0.235***	0.089	0.009	-0.206**	0.093	0.026
Edu	-0.014	0.048	0.765	-0.007	0.064	0.907
Dist	-0.003	0.003	0.401	0.006	0.004	0.194
TransO	-0.003	0.052	0.957	0.035	0.066	0.603
FBO	0.135***	0.049	0.006	-0.124**	0.064	0.053
Store	0.320**	0.159	0.044	-0.404***	0.149	0.007
Credit	-0.268**	0.126	0.033	-0.104	0.152	0.496
ExtVisit	-0.004	0.011	0.744	0.027*	0.014	0.056
FarmSize	-0.044**	0.019	0.022	0.073***	0.014	0.000
	Number of obs = 269 Wald chi2(14) = 23.77 Prob > chi2 = 0.0333 Pseudo R2 = 0.1382 Log pseudolikelihood = -100.42			Number of obs = 269 Wald chi2(14) = 48.58 Prob > chi2 = 0.000 Pseudo R2 = 0.1468 Log pseudolikelihood = -147.43		

Note: ***, ** and * represent 1%, 5% and 10% significant levels respectively

Source: Field survey (2016)

Factors Influencing Farmers' Decision to Cultivate Tomato for Marketing

The coefficients of all the variables included in the tomato marketing model had their expected *a priori* signs except education, transport ownership, credit access, number of extension visits received and farm size. The tomato marketing model further revealed that being a male farmer, household headship, FBO membership, storage of produce, credit and farm size had statistically significant effect on the decision of a farmer to produce more tomato for the market.

Being a male farmer was found to be positive and statistically significant at 5 percent significance level. The results showed that male farmers are about 10 percent more likely to cultivate tomato for marketing compared to their female counterparts. For instance, Vigneri and Vargas (2011) showed that women hardly had the same access to assets and markets as men. Consequently, women tend to participate less in producing for the market than men and mostly grow subsistence crops for food security while crops meant for cash income are grown mainly by male farmers. Sebatta et al. (2014) found similar results in a study on potato and explained that in most cases it is the males in a family who make the decisions on whether to produce and sell the food crop or not and how much.

Household headship status of the farmer was positive and statistically significant at 1 percent significance level and thus has an effect on the volumes of tomato produced and sold into the market. The unitary household approach suggests that households behave as individuals and that household

decision-making is done through a single household head (Ligon, 2011; Mendola, 2007). The conceptual framework clearly captures this at the level of household production and marketing optimization where all such decisions are made.

The decisions made in the household on whether to produce and sell or not thus depend on one's position in the order of hierarchy in the family which could be determined by sex or age (Sebatta et al., 2014). The results further reveal that farmers who are heads of households are 23.5 percent more likely to cultivate tomato for marketing compared to their counterparts who are not household heads.

FBO membership was positive and statistically significant at 1 percent significance level and therefore influenced the quantity of tomato produced and sold in the market. The results further indicate that farmers who are members of FBO are 13.5 percent more likely to cultivate tomato for marketing than those who are not members of FBO. This could be due to the fact that working in a group creates synergy among the farmers and makes it easier to access market information and share experiences. Fischer and Qaim (2012) also found a positive and significant influence of group membership on the level of commercialisation of smallholders in Kenya and concluded that membership of farmers' group improves access to technology, training and output market and consequently increases farm profits.

Credit access is found to have a negative and statistically significant relationship with the decision to cultivate more tomato for marketing. This is significant at 5 percent significance level. The results further show that

farmers who had access to credit are 26.8 percent less likely to cultivate tomato compared to their counterparts who do not have access to credit. The implication is that continuous use of credit does not help tomato farmers to cultivate more tomato for marketing. This is reflected in the conceptual framework of the study which identified the influence of the socio-economic environment including credit in the decision that farm households make to optimise food production to reduce poverty.

Farm size has a negative and statistically significant (5%) relationship with the decision to produce tomato for marketing. The results further reveal that if the size of farm of a farmer increases by 1 hectare the probability that farmers will cultivate tomato for marketing will reduce by 4.4 percent. Anang et al. (2013) attributed the small sizes of tomato farms to the capital intensive nature of tomato production and the difficulty farmers experience in raising enough capital to expand their scale of production. Own capital has been identified by the conceptual framework of the study as a key resource that is necessary in farmers' decision to produce more tomato for marketing to increase farm incomes.

Factors Influencing Farmers' Decision to Cultivate Plantain for Marketing

Coefficients of independent variables included in the plantain marketing model had their expected *a priori* signs except household size, household headship, education, FBO membership, storage and credit access. The statistical evidence in Table 31 further shows that age, household size,

household headship, FBO membership, storage, and farm size are factors that influence a farmer's decision to cultivate plantain for marketing.

Age of the farmer is found to be positive and statistically significant at 1 percent significance level and therefore impacts on the decision to produce plantain for the market, unlike the case of tomato where age was not identified to have any impact. Dzomeku et al. (2011) found in a study on plantain cultivation in Ghana that much older people were in the production of plantain than young people while Bortey and Osuman (2016) also found that majority of tomato farmers were youthful. Even though there can be several reasons for this, it can be deduced that more youthful farmers are being attracted into tomato farming and it is not the preserve for older farmers as appears to be the case of plantain production.

The attraction into tomato farming may possibly be for profit-maximising reasons since, according to Crawford (2006), the primary interest of most food produce farmers is in getting the best return from their production. This is also inherent in the agricultural household decision-making theory. The theory posits that farm households have an objective function to maximize profits towards poverty reduction (Donnellan & Hennessy, 2012). As suggested by the conceptual framework of the study, food produce farmers find it important to apply their resources including labour in ways that yield optimal results in terms of food production and poverty reduction.

The results further showed that if the age of a farmer increases by 1 year the probability that he/she will cultivate plantain will increase by 4.3 percent. This suggests that age is an important factor in farmers' production

and marketing decisions. The results support Heltberg and Tarp's (2001) assertion that age is an indicator of the position of a member in a household as well as the ability to understand and effectively use market information. Furthermore, Sebatta et al. (2014) indicate that many decisions made in the household on whether to produce and sell or not depend on one's position in the order of hierarchy in the family. Thus, older members of the family tend to make the key decisions that affect the family welfare, including the decision to produce and sell plantain.

The result indicates that household size had negative effect on the decision to cultivate plantain for marketing. Household size was found to be statistically significant at 5 percent level. It further shows that if the household size of a farmer increases by 1 person the probability that he/she will cultivate plantain for marketing will reduce by 1.8 percent. In this regard, Cadot, Olarreaga and Dutoit (2006) explained that larger households seem to have lower per-capita income and hence less surplus to fund capital requirements of producing more plantain for the market.

Status of the farmer in the household was found to be statistically significant at 5 percent significance level but negative, unlike the case of tomato where it was found to be positive and significant. The results further show that farmers who are household heads are 20.6 percent less likely to cultivate plantain for marketing compared to their counterparts who are not heads of households. The household decision making theory postulates that the households behave as individuals and that household decision-making is done through a single household head (Ligon, 2011). Thus, the decision to

produce plantain for the market may rest with the household head which, as the conceptual framework of the study suggests, is influenced by the socio-economic environment, including price and non-price signals emanating from the plantain market.

The differences in the production and marketing decisions between plantain and tomato household heads may be due to the market signals that plantain and tomato household heads receive. These signals are fed into their production and marketing decisions for maximum profits and towards poverty reduction (Donnellan & Hennessy, 2012). This study, having arrived at the finding that the degree of spatial market integration of tomato is relatively stronger than that of plantain under objective two, suggests that the tomato market is more efficient than the plantain market (Acquah & Owusu, 2012). This may explain why plantain household heads are less likely to cultivate plantain for marketing.

The results indicated that FBO membership was negative and statistically significant at 5 percent level. The results further show that farmers who belong to FBOs are 12.4 percent less likely to cultivate plantain for marketing. This may be because, as found earlier in the analysis under objective one, more farmers who belong to farmer groups are producers of food crops other than plantain, particularly tomato. Additionally, tomato farmers in a group discussion were unanimous about the need for them to belong to their association.

The tomato farmers cited the highly perishable nature of their produce as a reason for them to have quick access to markets to avoid being at the

mercy of traders who are in strong associations. This is also inherent in the risk aversion theory. The theory espouses that farmers and traders display behaviour that decreases their risk exposure when they identify risk (Mendola, 2008). Yet even among tomato farmers, Britwum (2013) noted that they were not as well organised as traders in the tomato value chain.

Storage of produce was negative and statistically significant at 1 percent level. The results also revealed that farmers who store their produce are 40.4 percent less likely to produce plantain for marketing. This suggests that plantain farmers scarcely store their produce and the lack of proper storage facilities negatively influences their decision to produce for the market. This was corroborated by plantain farmers in a group discussion and to counteract the difficulty in storing plantain, the strategy they adopted was to leave the produce on the farm until there was a ready market. The finding confirms the assertion of Matsane and Oyekale (2014) that smallholder farmers face difficulties in storing their produce and tend to use traditional techniques of storage which reduce the quality of the produce.

Farm size is also found to be positive and statistically significant at 1 percent significance level. The results further indicate that if farm size increases by 1 hectare the probability that a farmer will cultivate plantain for marketing will increase by 7.3 percent. This implies that plantain farmers find it important to expand their farms as a decision to produce more for the market. This agrees with the findings of Ojediran et al. (2018) in a similar study on plantain in Nigeria where farm size was found to be positive and significant at 5 percent level. Farm sizes of plantain are bigger, in contrast to

what pertains in the case of tomato, possibly because it is less capital intensive than tomato production.

As expected, the number of extension visits received by the farmer is found to be positive and statistically significant, though marginally (10% significance level). The results further show that if the number of extension visits received by a farmer increases by one the probability that the farmer will cultivate plantain for marketing will increase by 2.7 percent. This corroborates the results of studies such as those by Gebremedhin and Hoekstra (2008) and Sebatta et al. (2014) which found a positive and significant effect of extension access on the volume of a crop (teff) sold and on the decision to participate in the market.

The studies attribute the positive effect of extension service to market information as well as information on new and improved varieties that extension agents provide which improves farmers' knowledge and enhances their choice of market opportunities. The conceptual framework of the study identified the influence of market information in linking food produce farmers to traders and enhancing spatial market integration and market efficiency. The marginal significance level for the extension service in the analysis may denote a weakness in the effectiveness of extension delivery to promote market efficiency.

Appreciating the importance of extension service in increasing smallholder food crop farmers' production and farm incomes, a MoFA staff in the Techiman Municipality on 1st December, 2016 explained the efforts that

MoFA is making to deliver extension service in spite of the challenges it encounters in these words:

“MoFA is committed to extending education to improve agriculture at every stage. That is our mandate and we see the fruit this work bears almost everyday – those of us close to farmers. So we are devising innovative strategies to reach out to farmers in the face of our numerous challenges. For instance, in order to address the low extension-farmer ratio issue, we are running mass media programmes such as using mobile vans, radio and community information centers. In terms of content, now our focus is more on market-oriented programmes than solely production-oriented ones and working with farmers to form FBOs is a priority in this direction. The FBOs are also helping to disseminate extension education wider and faster and thus contribute to alleviating the logistical challenges of MoFA.”

The response corroborates the finding that there may be inadequacies in extension delivery which may be affecting how smallholder farmers engage the market. It also suggests that organising farmers into groups is important in enhancing information sharing, including market information, among farmers which improves market integration, as Lohano and Mari (2012) have argued. The agricultural marketing theory postulates that market integration is a necessary condition in ensuring efficiency of marketing systems (Wyeth, 1992; Rapsomanikis et al., 2003). Extension education therefore contributes to

the promotion of market efficiency and consequently, to the improvement of farm incomes (Mensah-Bonsu et al., 2011).

Risk Level of Food Crop Farmers in Response to Weather, Price and Other Uncertainties

Risk is present in all agricultural management decisions as a result of different sources of uncertainty (Gomez-Limon et al., 2003). Generally, the risk bearing capacity of farming households can be explained by their socio-economic characteristics and these factors tend to make smallholder farmers inadequately equipped against risk and uncertainties (Adubi, 2000; Ayinde, 2008).

Risk level of the farmers was obtained from a 10 point scale question (1 being highly risk averse and 10 being highly risk loving) posed to the farmers about how prepared they were to invest resources such as time, money and land in the production of plantain and/or tomato in spite of weather, price and other uncertainties. Farmers with the score 1-3 were deemed risk averse, 4-7 were risk neutral and those with the score 8-10 were risk loving (Sulewski & Kłoczko-Gajewska, 2014). The distribution by district of farmers' risk level is presented in Table 33.

As indicated in Table 33, majority of the farmers (60.2%) were risk neutral followed by farmers who were risk averse (29.4%) with risk loving farmers being the least (10.4%). The results support the view that different farmers have varying risk tolerance levels and smallholder farmers are known to be less tolerable to risk because they are closer to the threshold in terms of savings and liquid assets (Udry, 1995). The results further show that the

majority (70.0%) of farmers in Tano North constituted those who were risk neutral followed by Asutifi South District where the majority (63.4%) of the farmers were risk neutral. Techiman Municipality, on the other hand, had majority (50.7%) of its farmers constituting those who were risk averse. The finding that the majority of farmers are risk neutral corroborates an assumption of the agricultural household theory that household members who make production and consumption decisions are risk neutral (Tzouvelekas, 2011).

Table 33: Risk level of food crop farmers in response to weather, price and other uncertainties

Level of Risk	Tano North	Techiman	Asutifi South	Total
Risk Averse	15 18.75	39 50.65	25 22.32	79 29.37
Neutral	56 70	35 45.45	71 63.39	162 60.22
Risk Loving	9 11.25	3 3.9	16 14.29	28 10.41
Total	80 100	77 100	112 100	269 100

Source: Field survey (2016)

Ordered logit was employed to estimate the factors that influence the risk level of food crop farmers in response to weather, price and other uncertainties with respect to their decision to produce for the market (Sulewski & Kłoczko-Gajewska, 2014). Marginal effects of the ordered logit model are shown in Table 34. The analysis of the overall model shows that the model is statistically significant. The pseudo R-square of the model show that about 15 percent of the variation in the dependent variable is explained by the independent variables.

Table 34: Factors Affecting Food Crop Farmers Risk Level in Response to Weather, Price and Other Uncertainties

Variable	Risk Averse			Neutral			Risk loving		
	dy/dx	SE	P> z	dy/dx	SE	P> z	dy/dx	SE	P> z
Sex	0.131**	0.063	0.038	-0.069**	0.033	0.038	-0.061*	0.032	0.055
Age	-0.015	0.013	0.256	0.008	0.007	0.259	0.007	0.006	0.264
Age2	0.000	0.000	0.397	0.000	0.000	0.398	0.000	0.000	0.403
HHsize	-0.021***	0.007	0.004	0.011***	0.004	0.005	0.010***	0.004	0.010
HHHead	0.098	0.092	0.288	-0.052	0.049	0.287	-0.046	0.044	0.298
Edu	-0.079	0.053	0.133	0.042	0.028	0.138	0.037	0.025	0.143
Distance	-0.006	0.004	0.117	0.003	0.002	0.127	0.003	0.002	0.122
TransO	-0.109**	0.055	0.049	0.058*	0.031	0.058	0.051*	0.027	0.055
FBO	0.051	0.053	0.332	-0.027	0.028	0.331	-0.024	0.025	0.342
Store	0.015	0.174	0.929	-0.008	0.092	0.929	-0.007	0.081	0.929
Credit	-0.336***	0.100	0.001	0.178***	0.060	0.003	0.158***	0.050	0.001
ExtVisit	0.008	0.012	0.471	-0.004	0.006	0.476	-0.004	0.005	0.469
Farm_Ha	-0.051***	0.013	0.000	0.027***	0.009	0.003	0.024***	0.006	0.000
FarmExp	0.004	0.002	0.144	-0.002	0.001	0.161	-0.002	0.001	0.141

Number of obs = 269
Wald chi2(14) = 70.05
Prob > chi2 = 0.000
Pseudo R2 = 0.147
Log pseudolikelihood = -206.676

Significance levels - *10%, **5%, ***1%
Source: Field survey (2016)

The results show that household size, access to credit and farm size were statistically significant for all the three groups of the risk levels. Sex was significant for risk averse and risk neutral groups while transport ownership was significant for only the risk averse group at 5 percent alpha value. However, age, household status, educational level, distance to market, FBO membership, storage of farm produce, number of extension visits received and

farming experience were not statistically significant in predicting the risk level of farmers to produce tomato and or plantain in spite of price, weather and other uncertainties.

Household size was found to be statistically significant among the three risk levels. It can be observed that an increase in household size by one person increases the probability of risk neutral (1.1%) and risk loving (1%) farmers to invest their resources into the production of tomato and or plantain in spite of price, weather and other uncertainties. This agrees with the finding of Juma, Nyangena and Yesuf (n.d.) in a similar study among smallholder farmers in Kenya that household size was positively correlated with investing resources into production by terracing.

With the risk averse group it can be observed that an increase in household size by one person decreases the probability of farmers to invest resources into the production of tomato and or plantain in the face of price, weather and other uncertainties by 2.1 percent. This is illustrated in the conceptual framework for the study which portrays that farm households make production and marketing decisions under the influence of some socio-economic environment such as food produce market, and invest resources in order to increase food production and reduce poverty.

Among all the risk levels access to credit was found to be statistically significant at 1 percent level. Among the risk averse group the results show that, for farmers who have access to credit the probability to invest resources into the production of tomato and or plantain considering price, weather and other uncertainties decreases. On the contrary, the probability to invest

resources into the production of tomato and or plantain increases for farmers in the risk neutral and risk loving group who have access to credit compared to their counterparts who do not have access to credit. According to Cole, Gine and Vickery (2014) financial innovation such as credit may boost risk-taking behaviour of farmers. This is consistent with the conceptual framework which alludes that socio-economic environment including access to credit can enable food crop farmers to enhance their production and reduce poverty.

Farm size was also found to be statistically significant at 1 percent level among farmers in all the risk levels. Among the risk averse group, the results show that increase in farm size by one hectare decreases the probability of risk averse farmers to invest their resources in the production of tomato and or plantain production in the face of price, weather and other uncertainties by 5.1 percent. However, an increase in farm size by one hectare increases the probability of risk neutral (2.7%) and risk loving (2.4%) farmers to invest their resources into the production of tomato and or plantain.

Thus risk neutral and risk loving farmers respond positively by increasing investments into the production of tomato and plantain. This is inherent in the conceptual framework of the study which illustrates the influence of the socio-economic environment, including the food produce market, on the production and marketing decisions of farmers to increase production and reduce poverty. The finding supports the observation of Ullah, Shivakoti, Zulfiqar and Kamran (2016) that greater farm size signals a larger capacity for bearing risk for farmers.

The results show that sex is associated with the level of risk of farmers in response to price, weather and other uncertainties for risk averse and risk neutral groups. It could be observed that the sign of sex for the risk averse group is positive whereas that for risk neutral group is negative. This implies that among the risk averse group the probability that a female farmer will invest resources in the production of plantain and or tomato in spite of price, weather and other uncertainties will increase compared to their male counterparts.

However, among the risk neutral, it could be observed that the probability of a female farmer to invest resources in the production of plantain and or tomato in spite of price, weather and other uncertainties decreases compared to their male counterparts. This is inherent in the risk theory which suggests that the risk bearing capacity of the farming households can be explained by their socio-economic characteristics including sex (Ayinde, 2008). It is also illustrated in the conceptual framework of the study which emphasises the importance of the food produce market, as part of the socio-economic environment, in influencing farmers in their production and marketing decisions to invest resources to increase production and reduce poverty.

Transport ownership was found to be statistically significant for only the risk averse group but the sign is negative. The study found that ownership of transport for transporting produce from the farm influenced farmers risk level to produce tomato and or plantain in spite of price, weather and other uncertainties. Among the risk averse group, the results show that for farmers

who own their transport for carrying farm produce, the probability that they will invest resources in the production of plantain and or tomato in the face of price, weather and other uncertainties decreases by 10.9 percent compared to their counterparts who do not own transport for carrying farm produce.

Conclusion

The results were presented in three separate chapters based on the objectives but linked up with the theories and the conceptual framework. The themes that run through the discussions were the issues that affect food produce marketing, assessment of the market efficiency of the food produce market and the decisions that farmers take to increase food production in response to the market environment they face. Regarding the issues that affect the food produce marketing, which relate to the objective one, the discussion covered the socio-economic characteristics of farmers and traders to understand the nuances that go on as they engage the market.

The second theme also highlighted the market efficiency of the food produce marketing from both the economic and the behavioural points of view. The economic aspect focused on spatial market integration for the determination of market efficiency while the behavioural aspect applied the relationship quality method using the perception of farmers of the quality of the relationship they have with traders which also determined the efficiency of the food producer market.

The third theme concentrated on finding how farmers are responding to the market environment to produce more food crops towards poverty reduction and development in general. It focused on the factors that influenced their

decision to produce more food crops as well as the factors that affect their risk levels which determine how they respond with a decision to increase food production for the market which constitutes agricultural growth. The findings of the study have explained the relationship between food produce marketing and agricultural growth.



CHAPTER NINE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents a summary of the study objectives, methodology used, the main findings, conclusions and contribution to knowledge. The major findings of the study and the conclusions arising from them form the basis for the recommendations that are indicated to make food produce marketing contribute more to the rate of agricultural growth. Areas for further studies have also been suggested and finally the research contributions that the study makes towards enriching the existing body of knowledge on food produce marketing and agricultural growth conclude the chapter.

Summary

There was the identified need to incorporate relationship quality in market efficiency in studying how the efficiency of the marketing system informs farmers' production decision making. This helps to address the neglect of relationships in understanding the efficiency of the marketing system. Thus this research sought to fill this gap by including an assessment of the relationship quality between smallholder food crop farmers and traders in determining the efficiency of the food produce marketing system and how this provides an incentive for farmers' decision to produce more.

The general objective of the study was to ascertain the contribution of food produce marketing on agricultural growth in three selected districts in Brong Ahafo Region of Ghana. The specific objectives were to examine the

issues that affect food produce marketing in the Brong Ahafo Region and to assess the extent of spatial integration of food produce markets in the Brong Ahafo Region. Other objectives were to explore the factors that define the relationship quality between farmers and traders in the food marketing channel in the Brong Ahafo Region and to examine the production decisions food crop farmers make in response to incentives from the food produce marketing system in the Brong Ahafo Region.

The study applied the mixed methods approach and used both quantitative and qualitative research methods, and relied on a cross-sectional survey approach. The applicable sample size of the study was 348 comprising 269 farmers and 79 traders taken from a total population of 22,182 food crop farmers and traders. The sample size assumed a confidence level of 95 percent indicating a margin of error of 5 percent. Additionally, three key informants who were MoFA staff were interviewed.

Multi-stage sampling methods were used to ensure that all the various categories of the participants were fairly represented. The selected study districts of Asutifi South District, Tano North District and Techiman Municipality were rural, semi-rural and urban districts respectively. Both primary and secondary data were collected; focus group discussions, market scene observations and documents including journals and reports were also used. Interview schedules and an interview guide were the main instruments used for data collection. The research instruments were pre-tested in five communities in Sunyani West District and the field data collection was conducted in November and December 2016.

Collected data were analysed using both quantitative and qualitative methods. The quantitative data analysis applied descriptive and inferential statistics. The descriptive statistics included cross-tabulations and regression to measure relationships. The qualitative data were analysed through transcribing narratives from key informant interviews, focus group discussions and interviews. Quantitative data were analysed using the Statistical Product and Service Solutions (SPSS) version 16.0 and Eviews version 8.

As the first objective, the study examined the issues that affect food produce marketing in the Brong Ahafo Region and the following were observed:

1. Food crop farmers are generally aging with 27.5 percent of farmers in the study area above the economically active age. Tomato farmers appear to be quite younger with an average age of 44.6 years as against plantain farmers (47.5 years).
2. Most food crop farmers are literate with tomato farmers being 71.4 percent and plantain farmers 71.7 percent literate. However, the proportion of farmers who have attained post-secondary education with the potential of becoming middle level technical people was generally low (0.7%) for all the districts.
3. Generally, less than half of the food crop farmers belong to FBO groups. Higher proportion of the tomato farmers (42.9%) belong to an FBO group relative to the plantain farmers (23.9%).
4. Food crop farmers, on the average, received close to two visits of agricultural extension agents in the last 12 months. The results show that on

average plantain farmers received a higher number of visits (2 visits) relative to the tomato farmers (1.6 visits).

5. The road infrastructure is generally seen to be in bad condition. Many (46.5%) farmers perceived the road condition as bad while only a few (7.3%) perceived it as very good.
6. Food produce traders are fairly literate (78.5%) with 21.5 percent of the respondents being illiterates.
7. Majority (91.0%) of the sampled traders grade their wares before selling. Group discussion revealed that grading as a marketing practice is taken more seriously by retailers than wholesalers.

With regards to objective two, the study analysed the spatial integration of food produce markets in the Brong Ahafo Region and came out with the following findings:

1. The error correction results of market integration support the hypothesis that food produce markets in the three districts were spatially integrated. Both plantain and tomato markets studied were integrated spatially, though weakly, with an overall degree of integration in plantain and tomato markets of 17 and 26 percent, respectively.
2. Overall the degree of integration in tomato markets is relatively stronger than in plantain markets.
3. The speed of adjustment of prices to the long run equilibrium is relatively fast for both plantain and tomato markets, despite the weak integration. The estimated speeds of adjustment of prices for plantain markets vary from 0.01 to 0.39 while those for tomato markets vary from 0.08 to 0.70.

4. The wrong (positive) sign and the mostly non-significance of the speed of adjustment showed weak short-run integration for the plantain markets and moderate for the tomato markets.

Under objective three, the study found out the following about the factors that define the relationship quality between farmers and traders in the food marketing channel in the Brong Ahafo Region:

1. There is an overall good quality relationship between food produce farmers, represented by tomato and plantain farmers, and their traders. The result of the analysis shows a cumulative variation of 77.2 percent in the quality of the relationship between tomato farmers and their traders. Similarly, the result indicated a cumulative variation of 60.8 percent in the quality of the relationship between plantain farmers and their traders.
2. Commitment, trust, loyalty, non-economic satisfaction, communication, price satisfaction, relational value and domain expertise are the main factors that explained the relationship between tomato farmers and their traders in order of their importance. These eight factors explain a cumulative variation of 77.2 percent in the quality of the relationship between tomato farmers and their traders and was statistically significant (p-value = 0.0000).
3. Generally, tomato farmers are moderately satisfied with the relationship they have with their traders. Furthermore, the results indicate that tomato farmers are more satisfied with non-price or non-economic aspects of their relationship than the price aspect.

4. The results also show that communication influences the tomato farmer's perception of relationship quality more than price.
5. The main factors that explain the quality of the relationship between plantain farmers and their traders are commitment, satisfaction and trust in order of importance. The three factors gave a cumulative variation of 60.8 percent in the relationship quality between plantain farmers and their traders which was statistically significant (p -value = 0.0000).
6. Generally, plantain farmers are better satisfied with the relationship they have with their traders than their tomato farmer counterparts. Satisfaction explains 22.2 percent of the quality of the relationship between plantain farmers and their traders while a combined satisfaction variation of 17.6 explains the relationship quality of tomato farmers and their traders.

The key findings concerning objective four relating to the production decisions that food crop farmers make in response to incentives from the food produce marketing system in the Brong Ahafo Region were that:

1. Farmers respond to the food produce marketing system with the decision to increase production based on how they experience the market. The tomato marketing model revealed that sex of a farmer, household headship, FBO membership and storage of produce had statistically significant and positive effect on the decision of a farmer to produce more tomato for the market.
2. Credit access and farm size were found to be negative and statistically significant at 5 percent significance level for the tomato marketing model.

3. The plantain marketing model showed that age, household size, household headship, FBO membership, storage, and farm size are factors that influence a farmer's decision to cultivate plantain for marketing. Of these factors, only age and farm size showed positive influence on plantain farmer's decision to cultivate more for marketing.
4. Majority of the farmers (60.2%) were found to be risk neutral followed by farmers who were risk averse (29.4%) with risk loving farmers being the least (10.4%).
5. The results show that household size, access to credit and farm size were statistically significant for all the three groups of farmers with the different risk levels. However, these three variables showed negative signs for the risk averse group while they showed positive signs for both the risk neutral and risk loving groups.

Conclusions

Issues that affect food produce marketing were aging farmers most of whom are literate. However, the level of education is mostly below post-secondary education at which they have the potential of becoming middle level technical people. Other issues include low membership in FBO groups, low access to agricultural extension delivery, bad road condition, low literacy among food produce traders and some good marketing practices such as grading that are not observed by some traders, especially wholesalers.

Both plantain and tomato markets, representing food produce markets, are integrated spatially, though weakly in the Brong Ahafo Region, signifying weak market efficiency. Overall the degree of long-run spatial integration in

tomato markets is relatively stronger than in plantain markets. The speed of adjustment of prices to the long-run equilibrium is relatively fast for both plantain and tomato markets but weak short-run integration for the plantain markets and moderate for the tomato markets were found.

There is an overall good quality relationship between food produce farmers, represented by tomato and plantain farmers, and their traders which implies good market efficiency. Commitment, trust, loyalty, non-economic satisfaction, communication, price satisfaction, relational value and domain expertise are the main factors that explain the relationship between tomato farmers and their traders in order of their importance. Generally, tomato farmers are moderately satisfied with the relationship that they have with their traders and are also more satisfied with non-price or non-economic aspects of their relationship than the price aspect. The main factors that explain the quality of the relationship between plantain farmers and their traders are commitment, satisfaction and trust in order of importance. Generally, plantain farmers are better satisfied with the relationship they have with their traders than their tomato farmer counterparts.

Food crop farmers' decision to increase production in response to the food produce marketing system is enhanced by socio-economic characteristics of farmers including age, sex and household headship and other factors such as FBO membership, storage of food produce and farm size. Specifically, tomato farmers' decision to increase production for the market is facilitated when the farmers are males, household heads, FBO members and are able to store tomato to some extent. Plantain farmers' decision to increase production

for the market is boosted when they advance in years and also when their farm sizes increase. Majority of the farmers are risk neutral and would generally decide to increase production for the market when there are increases in household size, credit and farm size.

Food produce marketing is affected by several issues including ageing farmers, low membership in FBO groups, low access to agricultural extension delivery and bad road condition. Others are low level of education and low adherence to good marketing practices by traders. Consequently, the food produce marketing in the Brong Ahafo Region experiences weak market efficiency due to weak spatial market integration but good market efficiency due to good quality relationship between farmers and their traders. In response to these, farmers decide to increase production based on some characteristics including age, sex, household headship and FBO membership. Farmers respond to the market environment and increase food production and agricultural growth which then can lead to poverty reduction and development in general.

Recommendations

Based on the key findings and conclusions it is recommended that:

MoFA should:

1. Strengthen the implementation of its policy to reach farmers with extension education, particularly for smallholder food crop farmers by channeling more resources into extension delivery. This can help facilitate the acquisition of knowledge in production and marketing of food crops by smallholder farmers to enable them to

effectively engage the market for increased farm profits to reduce poverty.

2. Educate the public to attract the educated into food crop farming since educated farmers will be more receptive to innovations and modernisation of the sector. The use of public fora and mass media to showcase the remunerativeness of farming may help reduce the perception that it does not pay off.
3. Mobilise more food crop farmers to form strong FBOs in their various communities to give them a strong collective voice to negotiate for more remunerative prices and other benefits, and to shape policies in their favour since more than half of food crop farmers are yet to belong to FBOs.
4. Contact Government to strengthen policies and practices that improve access to credit for smallholder farmers and traders to enable them expand their businesses.

Food produce farmers need to:

1. Invest in their own education and that of their children to help improve their potential in adopting innovative practices in the farming business. This will also enable them to effectively engage policy makers for increased benefits.
2. Advocate for Government to provide basic infrastructure for food produce marketing including adequate and good quality roads, storage (refrigerated storage facilities for tomato in particular) and

processing to reduce post harvest losses and improve profitability of food produce marketing.

3. Encourage and support their children to enter into the farming business to have a more youthful farming population who can bring improvements in the food crop subsector. Farmers may offer land, start-up capital and other resources to their children to help them enter into farming.
4. Educate members of FBOs to adopt marketing practices such as grading that enhance relationship quality between them and the traders to reduce transaction costs and hence increase farm incomes.

Food produce traders should:

1. Improve their communication with farmers that they trade with, especially tomato farmers. This is because communication is important to farmers and generates satisfaction more than the prices they receive. Trader associations may embark on membership education on the use of communication in the trading business.
2. Invest in their own education to help improve their potential in adopting innovative practices in the trading business in order to improve market efficiency.

Contribution to Knowledge

The study has contributed to addressing the gap as well as broadening the existing body of knowledge on food produce marketing and agricultural growth in the following ways:

1. Harmonising behavioural and economic approaches to understand market efficiency is quite new in food produce marketing studies.

The study has therefore addressed the gap in literature concerning the lack of empirical evidence regarding the understanding of market efficiency from the analyses of both relationship quality and spatial market integration.

2. The different contribution the study makes to the theoretical literature on agricultural commodity marketing is in integrating economic and social or behavioural theories to explain the efficiency of food produce market in the Brong Ahafo Region. It has thus revealed the relevance of the complementary roles of the economic and behavioural theories to explain the efficiency of the food produce market.

3. The study has delved into the micro level linkages between food produce marketing and agricultural growth. It contributes to the wealth of knowledge existing on the link between food produce marketing system and agricultural growth. In particular, the literature on the factors that enhance smallholder farmers' decision to increase production in response to market signals including age, sex, household headship, FBO membership, storage of food

produce and farm size is enriched. Studying and documenting the contribution food produce marketing makes to agricultural growth corrects the over-emphasis of production at the expense of marketing in national agricultural policies.

4. Findings of the study build on empirical literature on plantain and tomato marketing in Brong Ahafo Region.

Suggested Areas for Further Studies

The limitations that the study faced included the limited geographical coverage of three districts. This indicates a limitation in terms of size and composition of sample size and may reduce the representativeness and generalisability of the findings. In addition, the analysis of relationship quality was based on single sided interviews with the tomato and plantain farmers while the opinions of the traders were completely ignored, and therefore, potentially subject to hindsight and other biases.

Based on limitations of the study, the following further studies were suggested:

1. Study food produce marketing and agricultural growth in the other districts that were not part of the study area in the then Brong Ahafo Region. This will enable a comprehensive study on the topic in the three new regions the then Brong Ahafo Region has now been split into for a better comparative analysis.
2. Incorporate the perspectives of traders in the analysis of relationship quality to provide holistic overview information in relation to farmer-buyer relationships in the food produce

marketing. Relationship quality studied from both sides would provide valuable insights since various dimensions of relationship quality from the traders' perspective might be different from those of the farmers.



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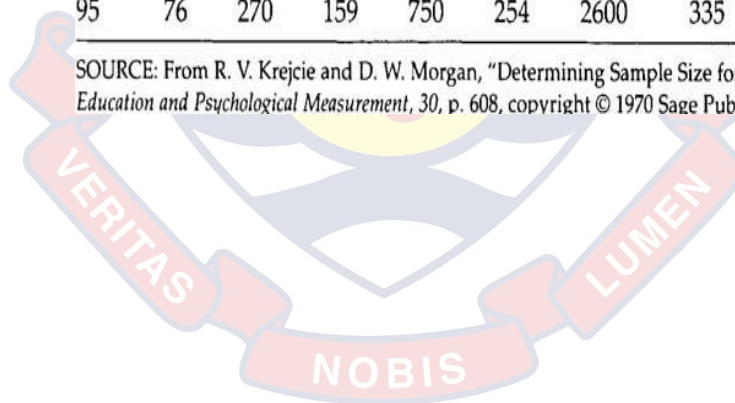
APPENDICES

APPENDIX A

SAMPLE SIZE DETERMINATION TABLE

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	20000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

SOURCE: From R. V. Krejcie and D. W. Morgan, "Determining Sample Size for Research Activities," *Education and Psychological Measurement*, 30, p. 608, copyright © 1970 Sage Publications, Inc..



APPENDIX B

INTERVIEW SCHEDULE FOR FARMERS

The researcher is a PhD student at the Institute for Development Studies, University of Cape Coast, Ghana. The general objective of the study is to analyse the implications of food produce marketing on agricultural growth in the Brong Ahafo Region. It is hoped that when completed, the study will provide policy recommendation for the improvement of food produce marketing. The researcher will rely on your participation for the successful completion of this study. Kindly provide responses to the questions below as accurately as possible. The researcher assures you that any information you provide will be accorded the confidentiality that it deserves.

Thank you.

Code Number:..... **Date:**

Name of interviewer:..... **Start time:**

Background characteristics (Please tick where appropriate)

- i. Community:..... ii. District:
- iii. Name of farmer:..... iv. Sex: M [] F []
- v. How old are you?years
- i. What is your marital status? Single [] Divorced []
Widowed [] Separated [] Married []
- vii. What is the highest level of education attained?
No formal education [] Primary/Middle/JHS []
Secondary/Tech/Voc []

Post-secondary (Teachers'/Nurses' Training/ Polytechnic) []

University []

- viii. Number of children:
- ix. Size of household:
- x. Are you the head of the household? Yes []1 or No []0. If no, please do not continue.

Factors affecting food produce marketing

1. What is the condition of the road network from the local area to the peri-urban or urban area?
2. How far are the distances from your farm to the closest and the farthest selling points? i. Closest..... ii. Farthest.....
3. What is the most common mode of transportation for agricultural produce?.....
4. Do you have your own means of transport for carting your farm produce? Yes []1 or No []0.
5. If yes, what type(s)? Bicycle [] Motor bike [] Motor-king [] Trucks [] Other []
6. If no, how do you transport your tomato and/or plantain from the farm to the selling point? Head load [] Hire a truck [] Hire a motor-king [] Hire a tractor [] Other []
Specify.....
7. If hired transportation is used, indicate the charges for each produce over the distance in Table 1.

Table 1: Transport charges for farm produce

Type of produce	Amount charged in ¢	
	Closest distance.....km	Farthest distance....km
Plantain (per average bunch)		
Tomato (per crate/basket)		

8. Can you easily sell your produce when you want to at any time of the year, especially when the rains have started? Yes []1 or No []0.

Please give reasons for your answer

.....

9. Are you a member of any farmer group? Yes []1 or No []0. Give reasons.....

10. If yes, do you think you get significantly higher prices because you are in a farmer group? Yes []1 or No []0 Give reasons.....

11. If no (referring to question 9), do you think it would be beneficial for you to be in a farmer group? Yes []1 or No []0. Explain.....

12. Do you give produce to traders and get paid later? Yes []1 or No []0. Please give reasons for your answer.....

13. If you answered yes, how do you know that they will come and pay you?

14. If yes to Q12, how long does it normally take for you to get paid?

15. Do you store your produce before selling? Yes []1 or No []0. Give reasons for your answer.....

16. If yes, indicate how you store your farm produce in Table 2.

Table 2: Storage of farm produce

Type of produce	Mode of storage	Ave. number of days it keeps	Cost of storage(¢)
Plantain			
Tomato			
Cassava			
Pepper			

17. How much of your farm produce is lost through transporting/handling or your inability to sell? Indicate answers in Table 3.

Table 3: Loss of farm produce during marketing

Type of produce	Number of items of produce lost during marketing	% of total harvested	Estimated value in cedis
Plantain (bunches)			
Tomato (baskets/crates)			
Cassava (bags)			
Pepper (bags/baskets)			

18. Do you grade or sort your produce according to size and quality and then price accordingly? Yes []1 or No []0. Explain why.....

19. Do you have uniform or standardised measures you always use for selling plantain and/or tomato to any trader? Indicate your answer in

Table 4.

Table 4: Standardised measures for selling plantain and tomato

Crop	Standardised measure		If yes, specify the measure	Weight or size of measure
	Yes	No		
Plantain				
Tomato				

20. If no, do you think it negatively affects how you compare produce prices during price negotiation? Yes []1 or No []0. Give reasons.....

21. How do you get to know plantain and/or tomato prices in other districts/regions?

- i. Radio [] ii. Traders [] iii. Visiting relatives [] iv. Others (specify).....

22. If you receive any food produce price information, to what degree would you say it helps you to bargain for a better price for your produce? State on a scale of 1 to 10 (ascending order).

23. What major factors do you consider in fixing the selling price?

24. Indicate the periods for bumper and lean seasons and the prices you received for plantain and/or tomato in Table 5.

Table 5: Seasonal variations in prices of plantain and tomato in 2015 & 2016

Crop	Harvest season		Lean season		Price range (¢)
	Period	Price (¢)	Period	Price (¢)	
2015					
Plantain (average bunch)					
Tomato (basket/crate)					
2016					
Plantain (average bunch)					
Tomato (basket/crate)					

25. Are you able to obtain credit for crop marketing purposes? Yes []1
or No []0

If yes, please indicate the actual terms of your credit sources in Table 6.

Table 6: Sources and terms of credit for crop marketing

Cr Credit sources	Credit terms					
	Min. period of saving	Max. loan size	Grace period	Repayment schedule	Interest rate	Training support
Family/friends						
Susu						
Micro credit						
MASLOC						
Rural Bank/Bank						

If no, explain why?.....

26. Are you fully prepared to invest time, money and other resources in the marketing of your produce in spite of price uncertainties? Classify yourself on a scale of 0 to 10.

27. What problems do you face in marketing plantain?.....

28. What problems do you face in marketing tomato?.....

29. What do you think are the solutions to the problems?

30. Are you able to cope with the problems? Yes []1 or No []0.

31. If yes, to what degree? Choose from a scale of 1 to 10.

Explain as to how you are coping up with the problems associated with crop marketing.....

Relationship between farmers and traders

32. Who are the major buyers of your crops?

33. Are the buyers locally based? Yes []1 or No []0.

34. If no, where do the buyers come from?.....

35. Is there a large number of buyers? Yes []1 or No []0.

36. Who do you prefer selling to? Indicate your preference in order of priority with 1 being the topmost priority:

- i. Farm gate to itinerant buyers []
- ii. home to local & itinerant buyers []
- iii. local market to local buyers/consumers []
- iv. Closest urban market []
- v. regional market []
- vi. Outside region []
- v. Outside country []

Give reasons for your preferences.....

37. Are you able to sell to other markets other than the local market here?

Yes []1 or No []0. Give

reasons.....

38. Who do you normally sell to? Indicate the most often occurring as 1,

the next as 2 in that order: i. Farm gate to itinerant buyers []

ii. home to local & itinerant buyers []

iii. local market to local buyers/consumers []

iv. Closest urban market []

v. regional market []

vi. Outside region []

v. Outside country []

39. What are the advantages and disadvantages in selling to your most occurring buyer(s)?

Adv.....

.....

.....Disadv.....

40. Have you had any verbal or written contractual agreement with any

buyer? Yes []1 or No []0. Explain

why.....

41. If yes, indicate the nature of the agreement by ticking the appropriate

box in Table 7.

Table 7: Nature of contractual agreement

FoForm of agreement	Terms of Agreement clearly indicated				
	Specific quantity	Specific time to deliver produce	Specific amount to be paid	Specific time to be paid	Conditions for abrogation
Verbal					
Written					
Both					

42. Do your regular/main buyers come with predetermined prices? Yes []1 or No []0

43. Prices for tomato/plantain are always determined at the time of purchase

i. Fairly agree [] ii. Agree [] iii. Strongly agree []

44. In terms of the power you have over the price discovery process as against that of your buyer(s), how many points out of 10 will you give to yourself and your buyer(s) in different seasons? Indicate answer in Table 8.

Table 8: Power shared by trading partners in different seasons

Partner	Power shared by trading partners		
	Bumper season	Lean season	Overall
Yourself			
Buyer(s)			

45. Please indicate the extent to which you agree with the statements in the table on a scale of 1 to 5 (1 = very low, 2 = low, 3 = fairly high, 4 = high and 5 = very high) by ticking the appropriate box.

Table 9: Relationship quality

STATEMENT	1	2	3	4	5
a. Continuation with old buyers despite cheating					
b. Enjoy relationship with the major buyers					
c. I would not sell to other buyers because I like being associated with my buyer					
d. Our relationship is something that we are very committed to					
e. I care about the long-term success of the relationship with my buyer					
f. My buyer always keeps his/her promises					
g. I receive payment on time					
h. I believe the market prices and other information provided by my buyer					
i. I find my buyers reliable in terms of having enough capital					
j. Regarding the price I receive, my buyer does not seem to take advantage on me					
k. My buyer will act and negotiate fairly even if the possibility of cheating exists					
l. My buyer is flexible to change order (prices and quantities) whenever I make the request					
m. In comparison to other buyers, I am					

satisfied with the price my buyer offers					
n. The buyer always communicates properly if the price changes					
o. The prices I received from my buyer are similar to the prices other farmers get					
p. I know that the price I received depend on the quality of my plantain/tomato					
q. Based on prices my buyer offers me, I will not change buyers					
r. My buyer deals with me as expected					
s. My buyer is quick to handle my complains					

Production decisions of food produce farmers

46. How long have you been in the farming business?years

47. In order of importance, indicate the crops you produce and the available land.

Table 10: Crops produced and available land

Priority	Crop	Size of farm under crop (acres)	Uncropped available land (acres)	Total available land (acres)	Mixed cropping Y or N
1					
2					
3					
4					
6					

NOTE: One and a half poles is equivalent to one acre

48. How did you decide to produce plantain and/or tomato? (Tick those that apply)

Table 11: Factors influencing initial decision to produce plantain and tomato

Crop	Factors influencing initial decision to produce crop						
	Availability of market	No. of traders	Presence of a factory	Availability of expertise	Availability of suitable land	Profitability	Other (specify)
Plantain							
Tomato							

49. What form(s) of access to land do you have?

- i. Own land [] ii. family land [] iii. rented land [] iv. share cropping []

50. How many people do you employ in your farming activity in a season?.....

51. How many of them are paid? How many are unpaid?

52. Are you able to obtain credit for crop production purposes? Yes [] or No []

If yes, please indicate the actual terms of your credit sources in Table 13.

Table 12: Sources and terms of credit for production

Credit sources	Credit terms					
	Min. period of saving	Max. loan size	Grace period	Repayment schedule	Interest rate	Training support
Family/friends						
Susu						
Micro credit						

MASLOC						
Rural Bank/Bank						

If no, give reasons.....

53. Tick as many as apply if you use any of the following items in your farming?

- i. Improved planting material []
- ii. Fertilizer []
- iii. Compost []
- iv. Pesticides on farm []
- v. Pesticides for storage []

54. Which place do you buy them from?.....

55. Indicate your ownership right of the agricultural machinery listed in Table 14.

Table 13: Agricultural machinery ownership right

Type of ownership right	Type of machinery	
	Water pump	Sprayer
Does not use		
Borrows from neighbours or relatives		
Exchanges for resource (land or labour)		
Shares with others as a cooperative/farmer group		
Rents		
Owens through purchase		

56. Do you intend to use income to invest to increase production or save?
 i. Invest [] ii. Save [] iii. Undecided []. Give reasons for your answer.....

57. If you will invest, what percentage of the income will be invested into farming?

58. What would you invest in to increase production, in order of importance?

- a. Labour []
- b. Improved planting material []
- c. Soil improvement (e.g. fertilizer, compost) []
- d. Machinery []
- e. Post-harvest practices (e.g. pesticides, storage) []
- f. Buy and/or rent farming land []

59. Indicate how you have been investing your income into expanding production over the last three years in percentages.

2014..... 2015..... 2016.....

60. Do you receive technical advice from Agricultural Extension Agents?

Yes []1 or No []0. Please

explain.....

61. If yes, how often in a cropping season? i. once [] ii. 2 times []
iii. 3 times [] iv. 4 times [] v. 5 times and more []

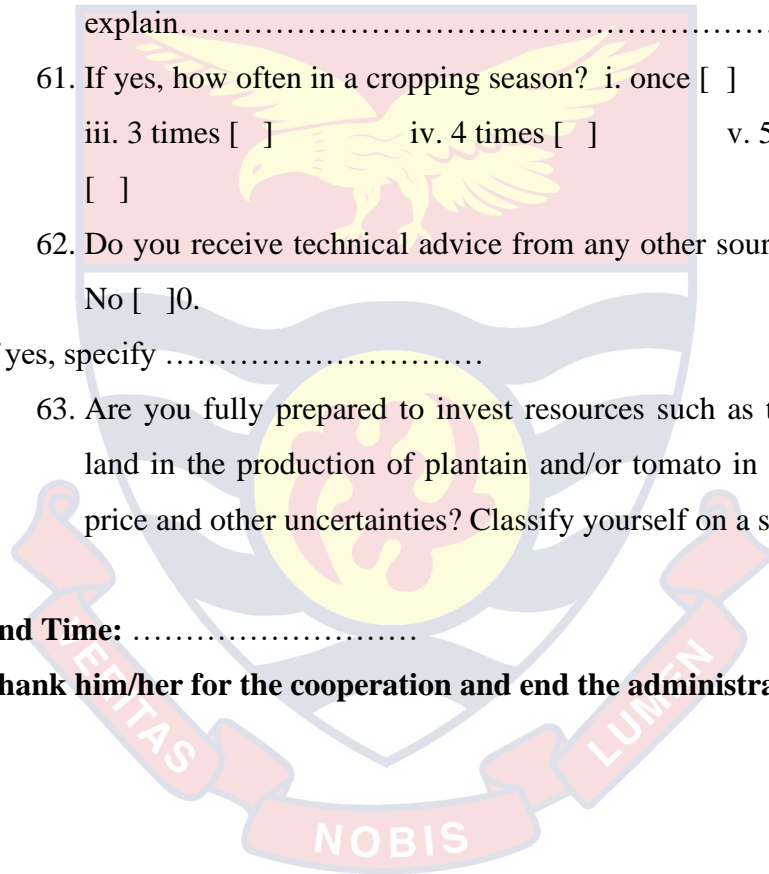
62. Do you receive technical advice from any other source? Yes []1 or No []0.

If yes, specify

63. Are you fully prepared to invest resources such as time, money and land in the production of plantain and/or tomato in spite of weather, price and other uncertainties? Classify yourself on a scale of 0 to 10.

End Time:

Thank him/her for the cooperation and end the administration



APPENDIX C

INTERVIEW SCHEDULE FOR TRADERS

The researcher is a PhD student at the Institute for Development Studies, University of Cape Coast, Ghana. The general objective of the study is to analyse the implications of food produce marketing on agricultural growth in the Brong Ahafo Region. It is hoped that when completed, the study will provide policy recommendation for the improvement of food produce marketing. The researcher will rely on your participation for the successful completion of this study. Kindly provide responses to the questions below as accurately as possible. The researcher assures you that any information you provide will be accorded the confidentiality it deserves.

Thank you.

Code Number:

Date: Name of interviewer:.....

Start time:

Background characteristics

- i. Town: ii. District:
- iii. Name of trader: iv. Sex: M [] F []
- v. How old are you? years
- vi. Marital status: Single [] Divorced [] Widowed []
 Separated [] Married []
- vii. Highest level of education:
- No formal education [] Primary/Middle/JHS []
 Secondary/Tech/Voc []

Post-secondary (Teachers'/Nurses' Training/ Polytechnic) []

University []

Size of household:.....

viii. Number of years engaged in tomato/plantain trading:
.....

ix. What food produce do you generally trade in? (Tick those that apply)

Tomato [] Plantain [] Cassava [] Cocoyam [] Maize [] Others

(specify)

Factors affecting food produce marketing

64. How did you decide to trade in tomato/plantain? (Tick those that apply)

iv. Availability of the market [] ii. Number of clients [] iii. Storage facility []

iv. Availability of food produce [] v. Profitability []

65. Since you started trading where do you normally obtain your tomato/plantain from?

Within the town/village [] ii. Neighbouring towns/villages [] iii. Other districts (specify)

iv. Neighbouring countries (specify)

3. How far are the distances from the closest and the farthest places where you buy the produce to where you sell them? i. Closest

Farthest.....

4. Do you have your own means of transport? Yes []1 or No []0.
5. If yes, what type(s)? Bicycle [] Motor bike [] Motor-king [] Trucks [] Other []
6. If no, how do you transport your tomato/plantain from place of purchase to your selling point? Hire a truck [] Hire a motor-king [] Hire a tractor [] Other [] Specify.....
7. If hired transportation is used, indicate the charges for each produce from place of purchase to your selling point in Table 1.

Table 1: Transport charges for farm produce

Type of produce	Amount charged in ¢
Plantain (per average bunch)	
Tomato (per crate/basket)	

8. What is the most common mode of transportation for agricultural produce?
9. What is the condition of the road network from the local area to the peri-urban or urban area?
10. Can you easily buy your produce when you want to at any time of the year, especially when the rains have started? Yes []1 or No []0. Give reasons.....
11. Are you a member of any trader association? Yes []1 or No []0. Give reasons.....
12. If yes, do you think you get significantly lower prices because you are in a trader association? Yes []1 or No []0 Give reasons.....

13. If no (referring to Q11), do you think it would be beneficial for you to be in a trader association? Yes []1 or No []0.

Explain.....

14. Do you collect food produce from farmers and pay later? Yes []1 or No []0. Please give reasons for your

answer.....

15. If you answered yes, how do the farmers know that you will come and pay them?

16. If yes to Q14, how long does it normally take for you to pay them?

17. Do you store the food produce before selling? Yes []1 or No []0. Give reasons for your answer.....

18. If yes, indicate how you store the food produce in Table 2.

Table 2: Storage of food produce

Type of produce	Mode of storage	Ave. number of days it keeps	Cost of storage (¢)
Plantain			
Tomato			
Cassava			
Pepper			

19. How much of your food produce you buy is lost through transporting/handling or your inability to sell? Indicate answers in Table 3.

Table 3: Loss of food produce during marketing

Type of produce	Number of items of produce lost during marketing	% of total bought	Estimated value in cedis
Plantain (bunches)			
Tomato (crates/baskets)			
Cassava (bags)			
Pepper (bags/baskets)			

20. Do you grade or sort the food produce according to size and quality and then price accordingly? Yes []1 or No []0. Explain why.....

21. Do you have uniform or standardised measures you always use for buying and selling plantain and/or tomato? Indicate your answer in Table 4.

Table 4: Standardised measures for selling plantain and tomato

Crop	Standardised measure		If yes, specify the measure	Weight or size of measure
	Yes	No		
Plantain				
Tomato				

22. If no, do you think it negatively affects how you compare food produce prices during price negotiation? Yes []1 or No []0. Give reasons.....

23. How do you get to know plantain and/or tomato prices in other districts/regions?

- i. Radio [] ii. Traders [] iii. Visiting relatives [] iv. Others (specify).....

24. If you receive any food produce price information, to what degree would you say it helps you to bargain for good prices for the food produce you buy? State on a scale of 1 to 10 (ascending order).

25. What major issues do you consider for fixing the selling price?
.....

26. Indicate the periods for bumper and lean seasons and the prices you paid for plantain and/or tomato to farmers in Table 5.

Table 5: Seasonal variations in prices of plantain and tomato in 2015 & 2016

Crop	Harvest season		Lean season		Price range (¢)
	Period	Price (¢)	Period	Price (¢)	
2016					
Plantain (average bunch)					
Tomato (basket/box)					
2015					
Plantain (average bunch)					
Tomato (basket/box)					

27. Are you able to obtain credit for crop marketing purposes? Yes []1 or No []0

If yes, please indicate the sources and the terms in Table 6.

Table 6: Sources and terms of credit for crop marketing

Cr Credit sources	Credit terms					
	Min. period of saving	Max. loan size	Grace period	Repayment schedule	Interest rate	Training support
Family/friends						
Susu						
Micro credit						
MASLOC						
Rural Bank/Bank						

If no, explain why.....

28. Trading in tomato/plantain is profitable (Indicate your view below)

i. Fairly agree [] ii. Agree [] iii. Strongly agree []

29. What are the major problems that you encounter in your trade? (Tick those that apply)

i. lack of clients [] ii. lack of sufficient funds [] iii. lack of means of transport [] iv. poor storage facilities [] v. unclear government policy [] vi. other (specify)

.....

30. What do you think are the solutions to the problems?

.....

31. Are you able to cope with the problems? Yes []1 or No []0. If yes, to what degree?

Choose from a scale of 1 to 10 and explain as to how you are coping up with the problems associated with crop marketing.

.....

32. Are you involved in any of the following activities? (Tick those that apply)

i. farming [] ii. farm input trading [] iii. transportation of goods and services []
 iv. other (specify)

33. Are you fully prepared to invest time, money and other resources in the marketing of plantain and/or tomato in spite of price uncertainties? Classify yourself on a scale of 0 to 10.

Relationship between farmers and traders

34. Who do you prefer buying from? Indicate your preference in order of priority with 1 being the topmost priority:

- i. Farmers at farm gate [] ii. Farmers in houses [] iii. local market traders []
- iv. itinerant buyers [] v. closest urban market traders [] vi. regional market traders []
- vii. Traders outside region [] viii. Traders outside country []

Give reasons for your

preferences.....

.....

35. Who do you normally buy from? Indicate the most often occurring as 1, the next as 2 in that order: i. Farmers at farm gate [] ii. farmers at home [] iii. itinerant buyers [] iv. Local buyers at local market [] v. Closest urban market [] vi. regional market [] vii. Outside region []

36. What are the advantages and disadvantages in buying from your most occurring seller? Adv.....

Disadv.....

.....

37. Are you able to sell to other markets other than the local market here?

Yes []1 or No []0. Give

reasons.....

38. What are the major reasons that motivate the choice of your selling point?

- i. Number of clients [] ii. Number of suppliers [] iii. Proximity to home []
- iv. Profitability [] v. Transportation cost [] vi. Other (specify)

.....

39. Do your regular/main farmers you buy from come with predetermined prices?

Yes []1 or No []0. Give

reasons.....

40. Prices for tomato/plantain are always determined at the time of purchase

- i. Fairly agree [] ii. Agree [] iii. Strongly agree []

41. In terms of the power you have over the price discovery process as against that of the farmers you buy from, how many points out of 10 will you give to yourself and your seller(s) in different seasons? Indicate your answer in Table 7.

Table 7: Power shared by trading partners in different seasons

	Power shared by trading partners		
Partner	Bumper season	Lean season	Overall
Yourself			
Seller(s)			

42. From whom did you purchase your tomato/plantain last year main season and what quantity? Indicate as appropriate in the table below:

Table 8: Sources and quantities of produce purchased

Source	Tomato Quantity bought (52kg crate)	Plantain Quantity bought (9-13kg bunch)
Farmers		
Small assemblers		
Wholesalers		
Other traders		
Other (specify)		

43. To whom did you sell your tomato/plantain last year main season and what quantity (i.e., no. of crates/bunches)? Indicate as appropriate in the table below:

Table 9: Destinations and quantities of produce sold

Destination	Tomato Quantity sold (52kg crate)	Plantain Quantity sold (9-13kg bunch)
Major market in district.....		
Sunyani market		
Techiman market		
A factory (Please name it)		
Others (specify)		

44. What is the reason for selling where you did?

- i. No other alternative buyer [] ii. The buyer offered a higher price []
] iii. Other reasons (specify)

.....

45. How does tomato/plantain get to your point of selling?

- i. It is brought to me [] ii. I go to fetch it myself [] iii. I make orders []

47. If the tomato/plantain is brought to you, who brings it?
 i. Farmers [] ii. Small assemblers [] iii. Wholesalers [] iv. Truckers []
 v. Others (specify)
48. If you go to fetch the tomato/plantain yourself, from whom do you get it?
 i. Farmers [] ii. Small assemblers [] iii. Wholesalers [] iv. Truckers []
 v. Other (specify)
49. If you make orders, from whom do you order your tomato/plantain?
 i. Farmers [] ii. Small assemblers [] iii. Wholesalers []
 iv. Truckers []
 v. Other (specify)
50. What is your strategy for buying tomato/plantain?
 ii. Buy during peak of harvest only [] ii. Buy in the lean season only []
 iii. Buy over the whole year wherever obtainable [] iv. Other (specify)
51. What is your strategy for selling tomato/plantain?
 i. Sell during peak of harvest only [] ii. Sell in the lean season only []
 iii. Sell over the whole year wherever obtainable [] iv. Other (specify)
52. Did you make any promises or contractual agreement to your suppliers before they delivered the tomato/plantain? Yes []1 or No []0.
 Explain why.....
53. If yes, indicate the nature of the agreement by ticking the appropriate box in Table 10.

Table 10: Nature of contractual agreement

Form of agreement	Terms of Agreement clearly indicated				
	Specific quantity	Specific time to deliver produce	Specific amount to be paid	Specific time to be paid	Conditions for abrogation
Verbal					
Written					
Both					

54. If you have a tomato/plantain buying or selling contract and tomato/plantain run out, what would you do?
 i. Revise the terms of the contract [] ii. Import from neighbouring region/country []

iii. Break the contract [] iv. Other (specify)

.....

55. Suppose you observe that the normal season has failed and there is no stock of tomato/plantain within your district, what would you do?

i. Go look for it in other district/region [] ii. Import it from other countries []

iii. Sell exclusively at retail the little that I have [] iv. Other (specify)

.....

56. Do you give credit to farmers? Yes []1 or No []0. Give reasons

.....

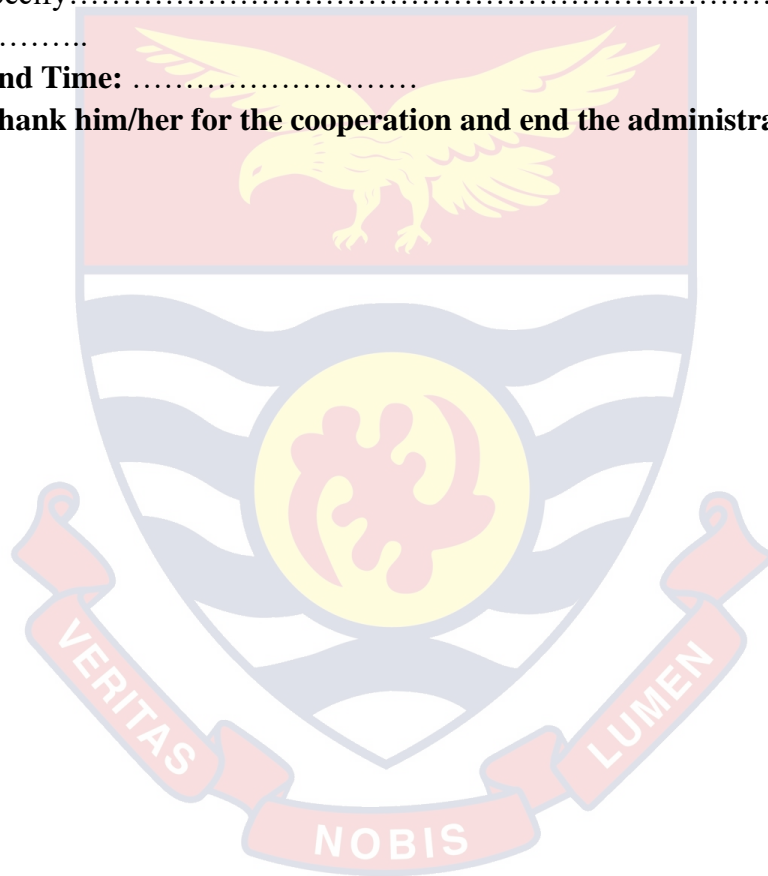
.....

57. Do you give other items or help to farmers? Yes []1 or No []0. Please specify.....

.....

End Time:

Thank him/her for the cooperation and end the administration



APPENDIX D

KEY INFORMANT INTERVIEW GUIDE

- 1.0 District/Community Profile
 - 1.1 Socio-economic characteristics of the district/community
 - Different ethnic groupings in the area
 - Estimated population, number of farm households in the area
 - Number of female versus male headed households
 - Presence of inward and outward migration and its causes
 - On-farm and off-farm economic and livelihood activities
 - 1.2 Weather and climatic characteristics of the area
 - Water, climate, vegetation, soil, etc.
 - 1.3 Institutions operating in the area - NGOs, Government institutions, community-based groups, private firms, etc.
 - 1.4 Farming activities
 - Agricultural productivity of the area (yield of various major crops)
 - Major food crops grown, area cultivated and harvested
 - Type of livestock kept, number and breed
 - 1.5 Level of infrastructural development and availability of basic services-health centers, schools, financial institutions, consumer goods, transport/ communication network
- 2.0 Effects of services provided by MoFA on food production and marketing
 - 2.1 Extension service
 - 2.2 Market price dissemination
 - 2.3 Formation of FBOs

APPENDIX E

FOCUS GROUP DISCUSSION GUIDE FOR FARMERS

1.1 Issues affecting food produce marketing

- Type of agencies (cooperatives and the different types of private traders) to whom farmers sell their commodities
- Why farmers choose these buyers
- Access to markets
- Distance to markets
- Availability and type of transport
- Quality of roads
- Prices for both inputs and outputs and consumer goods
- Availability of on-farm storage to take advantage of seasonal price variations
- Level of profitability viz-a-viz new investments

1.2 Credit facilities

- Availability of credit
- Type –formal or informal
- Institutions providing credit
- Their lending practices
- Lending practices of informal lenders
- The different forms of informal credit
- The commodities for which credit is available
- Perception of farmers concerning credit (availability, type and adequacy) and the lending practices

1.3 Farmer-Trader relationship

Trust

- Honest information on quantity -Trust in information: on quantities/ prices given by producers /traders
- Honest information on quality -Trust in information about quality often true

- Reliability -Trust the reliability of traders /producers in terms of enough capital and producers enough quantity
- Flexibility- Flexible in changing order prices and quantities when requested

Commitment

- Continuation with the old ones even if others are available
- Enjoy relationship with the major traders
- Continuation with old ones despite cheating

Satisfaction

- Price satisfaction- Fair prices, proper communication if price changes
- Relationship satisfaction – Reality meets expectation of treatment, addressing complains promptly

1.4 Farmer production decisions

- Investment of resources (land, labour, expertise, farm income
- Factors influencing decision to invest, proportion of farm income



APPENDIX F

FOCUS GROUP DISCUSSION GUIDE FOR TRADERS

1.0 Profile of traders

- The number of years traders have been operating
- Agricultural produce/ inputs other than tomato and plantain traded in
- Non-agricultural products traded in
- The background of traders (what business conducted before entry into the market)
- Number of boxes/bunches traded in, the capital employed and number of workers hired
- Ownership of such assets as transport and storage facilities.

2.0 The socio-economic characteristics of traders

- Estimated range of age
- The participation of women engaged in agricultural marketing
- General indication of level of education of traders
- Ethnic groups engaged in agricultural marketing

3.0 Pattern, nature, direction of trade

- Level of trading at different times of the year
- Growth of trade (i.e., whether it is increasing, constant or widely variable)
- Views on factors determining the variability of trading
- The nature of transactions (i.e., whether cash, barter with consumables or inputs, credit etc.)
- Availability of tomatoes/plantain vs consumables and other agricultural products
- Sources of funds, e.g. credit
- Who sells what to whom and where?
- What do they sell/buy (i.e., commodities, inputs, consumables, etc.).
- View on any change in pattern of trade

4.0 Price Integration

- Purchase price at different times in the marketing season
- Selling price at corresponding times in the marketing season
- Source of purchase and destination of sales by district at different times of the market season
- What factors determine the choice of source of purchases and destination of sales
- Types of transport used, capacity (baskets/bunches), distances and cost involved

5.0 Profitability

- Interest charges and their effect as reflected in seasonal prices
- Level of profitability viz-a-viz new investments
- Market information -source, relevance, adequacy, and accuracy
- Constraints and prospects
- Scale of operation
- Direction of trade movement, any limitations?

6.0 Farmer-Trader relationship

Trust

- Honest information on quantity -Trust in information: on quantities/ prices given by farmers /traders
- Honest information on quality -Trust in information about quality often true
- Reliability -Trust the reliability of traders /farmers in terms of enough capital and farmers enough quantity

Commitment

- Continuation with the old ones even if others are available
- Enjoy relationship with the major traders

- Continuation with old ones despite cheating

Satisfaction

- Price satisfaction- Fair prices, proper communication if price changes
- Relationship satisfaction – Reality meets expectation of treatment, addressing complains promptly

7.0 Views on current agricultural market arrangement

- Government regulations



APPENDIX G
MARKET OBSERVATION GUIDE

Market scenes

1. Arrival of market participants (note when sellers and buyers arrive)

.....

2. Display of market wares

Any grading, sorting, standardisation?

.....

.....

Price negotiation

3. Observe and record the verbal behaviours during price negotiation between sets of sellers (S) and buyers (B) in the table below:

Table 1: Price negotiation behaviours

Verbal behaviours	Tally for		Tally for		Tally for		Tally for		Tally for	
	Set 1		Set 2		Set 3		Set 4		Set 5	
	S	B	S	B	S	B	S	B	S	B
Proposition (calling the first price)										
Disagreement										
Explanation										
Reference back										
Resolution/ Compromise (calling the final price)										

Relationship between sellers and buyers

4. Cordiality between sellers and buyers (note the communication)

.....

APPENDIX H

**MONTHLY AVERAGE WHOLESALE NOMINAL PRICES OF
PLANTAIN AND TOMATO (2006 -2015) IN THREE MARKETS IN
BRONG AHAFO REGION**

PLANTAIN NOMINAL PRICES
TOMATO NOMINAL PRICES
(GH¢/9-11 KG BUNCH)
(GH¢/52 CRATE)

YEAR	MONTH	TECHIMAN	KENYASI	D'NKWANTA	TECHIMAN	KENYASI	D'NKWANTA
2006	JAN	1.10	0.00	2.50	16.13	0.00	18.00
	FEB	0.85	0.00	2.40	9.25	0.00	18.00
	MAR	1.08	0.00	0.00	22.50	0.00	0.00
	APR	1.03	1.20	0.00	32.00	29.40	0.00
	MAY	1.20	0.00	2.60	30.25	0.00	59.00
	JUN	1.88	0.00	0.00	21.75	0.00	0.00
	JUL	1.50	0.00	3.00	11.50	0.00	17.50
	AUG	1.30	0.00	3.50	27.50	0.00	11.00
	SEP	1.25	0.00	3.00	15.25	0.00	15.00
	OCT	1.00	1.20	1.50	21.00	16.00	11.00
	NOV	1.25	1.40	0.00	12.00	9.00	0.00
	DEC	1.25	0.00	0.00	11.00	0.00	0.00
2007	JAN	1.48	1.20	2.50	12.50	12.50	35.00
	FEB	1.25	0.00	1.80	12.00	0.00	11.00
	MAR	1.05	0.00	0.00	11.00	0.00	0.00
	APR	1.50	2.00	4.00	29.25	18.00	22.00
	MAY	1.75	2.87	4.00	51.25	58.00	80.00
	JUN	3.95	3.80	5.00	19.75	29.75	22.00
	JUL	2.88	2.80	3.00	28.50	25.30	30.00
	AUG	3.36	2.50	3.50	14.60	8.00	39.00
	SEP	1.67	1.72	2.50	17.50	13.25	28.00
	OCT	1.75	1.10	2.00	16.75	26.00	35.00
	NOV	1.88	1.10	2.20	22.00	27.00	26.00
	DEC	1.75	0.40	1.80	11.00	18.00	11.00
2008	JAN	1.87	1.20	2.00	13.50	10.60	9.00
	FEB	2.50	1.00	2.50	28.00	16.75	18.51
	MAR	2.50	1.20	2.80	31.75	21.60	22.00
	APR	3.62	2.00	2.80	52.50	38.00	48.00
	MAY	4.20	3.00	3.00	42.00	45.00	55.00
	JUN	3.50	3.00	0.00	35.00	42.00	0.00
	JUL	5.00	2.50	0.00	29.00	50.00	0.00
	AUG	4.30	1.50	2.90	35.00	41.00	40.00
	SEP	3.00	1.50	2.00	22.54	29.00	25.00
	OCT	2.20	1.50	1.55	27.33	35.00	27.50
	NOV	3.00	1.50	1.60	26.87	28.00	25.00

	DEC	1.52	1.50	1.65	43.75	35.00	27.50
2009	JAN	1.50	2.50	1.40	65.00	45.00	75.00
	FEB	1.50	2.50	1.40	66.25	38.00	41.25
	MAR	1.00	1.50	1.70	57.50	70.00	60.00
	APR	2.02	2.50	1.83	94.00	110.00	30.00
	MAY	2.10	3.00	2.83	115.00	160.00	110.00
	JUN	3.25	2.50	3.75	63.25	90.00	40.00
	JUL	3.80	2.50	3.38	136.00	70.00	97.00
	AUG	3.75	2.50	3.00	57.50	70.00	30.00
	SEP	4.62	2.50	2.80	43.75	35.00	50.00
	OCT	3.25	3.00	0.00	52.50	30.00	0.00
	NOV	2.85	3.00	0.00	32.50	30.00	0.00
	DEC	3.24	1.50	0.00	16.20	23.60	0.00
2010	JAN	3.75	2.50	5.00	36.75	35.00	20.00
	FEB	2.85	2.50	5.00	48.50	42.00	70.00
	MAR	3.70	3.00	6.00	83.00	80.00	120.00
	APR	4.00	4.50	0.00	106.54	130.00	0.00
	MAY	4.50	4.50	0.00	107.33	130.00	0.00
	JUN	5.50	4.50	7.00	141.00	130.00	180.00
	JUL	5.94	6.00	7.00	75.90	20.00	30.00
	AUG	5.97	3.00	0.00	28.75	70.00	0.00
	SEP	3.92	2.50	5.50	34.25	40.00	30.00
	OCT	3.22	0.00	4.00	35.20	0.00	35.00
	NOV	2.80	2.00	4.00	43.00	80.00	29.00
	DEC	3.20	2.50	6.00	39.00	50.00	31.00
2011	JAN	3.62	2.50	6.00	51.50	50.00	35.00
	FEB	3.62	2.50	4.00	54.50	35.00	38.00
	MAR	3.62	2.50	8.00	54.50	100.00	56.00
	APR	3.50	3.00	8.00	67.80	120.00	70.00
	MAY	4.00	4.00	6.00	95.25	100.00	70.00
	JUN	4.00	4.00	8.00	77.00	100.00	50.00
	JUL	6.00	6.00	9.00	56.57	100.00	45.00
	AUG	5.25	0.00	6.00	45.50	0.00	43.00
	SEP	5.00	3.00	5.00	45.60	50.00	50.00
	OCT	5.75	3.00	5.00	48.00	80.00	50.00
	NOV	5.50	3.50	7.00	32.25	35.00	35.00
	DEC	4.25	2.50	0.00	56.00	60.00	0.00
2012	JAN	4.00	3.50	0.00	82.50	160.00	0.00
	FEB	3.33	4.00	0.00	65.25	140.00	0.00
	MAR	5.40	6.00	8.00	80.00	150.00	190.00
	APR	6.12	6.00	11.70	91.00	130.00	196.00
	MAY	7.00	8.00	15.00	116.20	120.00	150.00
	JUN	10.00	8.00	16.00	40.75	90.00	101.25

	JUL	18.25	7.00	10.00	36.75	60.00	55.00
	AUG	14.40	7.00	15.00	50.60	50.00	100.00
	SEP	10.50	7.00	7.50	76.75	60.00	125.00
	OCT	10.75	5.00	6.50	80.25	60.00	160.00
	NOV	10.40	4.00	6.00	66.40	60.00	120.00
	DEC	8.00	0.00	6.00	20.00	0.00	90.00
2013	JAN	7.00	0.00	7.00	40.00	0.00	95.00
	FEB	10.00	0.00	0.00	139.00	0.00	0.00
	MAR	10.00	5.00	7.00	80.00	220.00	250.00
	APR	11.00	6.00	8.25	194.00	350.00	400.00
	MAY	14.00	6.00	11.00	115.00	120.00	400.00
	JUN	12.00	6.00	15.00	94.00	0.00	80.00
	JUL	15.00	6.00	11.00	96.00	0.00	0.00
	AUG	15.00	0.00	9.00	40.00	0.00	110.00
	SEP	10.00	0.00	7.50	40.00	0.00	80.00
	OCT	0.00	0.00	6.50	0.00	0.00	98.50
	NOV	0.00	0.00	6.00	0.00	0.00	80.00
	DEC	11.00	0.00	5.00	55.00	0.00	260.00
2014	JAN	10.00	5.00	5.00	52.00	120.00	55.00
	FEB	7.00	5.00	5.00	106.00	120.00	180.00
	MAR	7.00	5.00	5.00	99.00	200.00	256.00
	APR	7.00	7.00	8.00	147.00	200.00	300.00
	MAY	8.00	8.00	10.00	210.00	350.00	320.00
	JUN	12.00	8.00	12.00	103.00	350.00	170.00
	JUL	12.00	8.00	14.00	117.00	350.00	250.00
	AUG	13.00	0.00	8.00	187.00	0.00	330.00
	SEP	15.00	0.00	6.00	265.00	0.00	150.00
	OCT	12.00	7.00	4.00	180.00	0.00	63.00
	NOV	8.00	5.00	8.00	80.00	160.00	200.00
	DEC	10.00	4.00	7.00	148.00	170.00	350.00
2015	JAN	9.00	4.00	5.00	196.00	240.00	200.00
	FEB	8.00	5.00	6.00	305.00	240.00	423.00
	MAR	8.00	5.00	8.00	300.00	220.00	370.00
	APR	9.00	7.00	0.00	224.00	170.00	0.00
	MAY	11.00	9.00	12.00	240.00	170.00	350.00
	JUN	13.00	0.00	0.00	240.00	0.00	0.00
	JUL	18.00	0.00	20.00	188.00	0.00	60.00
	AUG	15.00	0.00	7.00	163.00	0.00	170.00
	SEP	11.00	8.00	0.00	278.00	150.00	0.00
	OCT	10.00	8.00	7.00	236.00	150.00	400.00
	NOV	10.00	6.00	0.00	288.00	500.00	0.00
	DEC	13.00	7.00	7.00	172.00	500.00	150.00

Source: Regional Agricultural Development Unit, MoFA, Brong Ahafo Region

APPENDIX I

GHANA ANNUAL CONSUMER PRICE INDEX - 2006 TO 2015

Index 2010=100

Year	CPI
2006	60.57
2007	68.29
2008	80.68
2009	93.57
2010	101.59
2011	110.31
2012	120.06
2013	138.39
2014	161.89
2015	190.49

Source: Ghana Statistical Service

