



ASHESI UNIVERSITY

FACTORS THAT AFFECT DEVELOPMENT OF ORGANIC TOMATO VALUE

CHAIN IN GHANA

Undergraduate Dissertation Submitted to The Department of Business Administration,
Ashesi University College in Partial Fulfillment of the Requirement for the Award of
Bachelor of Science Degree in Business Administration

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DECLARATION

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

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I hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by Ashesi University College.

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Date: May 11, 2020

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ABSTRACT

Organic agriculture is becoming a growing trend globally. Due to concerns for health and the environment, many consumers in some countries are shifting their consumption to organic products. As at 2017, the global market for organic farming stood at USD 97 billion (Willer & Lernoud, 2019). This market is however hugely concentrated in the developed countries, with African countries such as Ghana contributing very little. Due to the absence of support, the organic sector in Ghana, has lags in its development. This study therefore tries to delve deeper into the factors that affect the development of the organic value chain in Ghana (with focus on tomatoes) and explore how the value chain can be developed.

The study gathered primary data through interviews from farmers, retailers, distributors and consumers. Using qualitative analysis of the data collected, it was found that the organic tomato value chain in Ghana is weak in its input supply, marketing and supporting services. The study further that the actors have various needs that affect their proper functioning in the chain. The farmers needed access to proper infrastructure, and affordable input supply and affordable certification; the retailers and distributors needed logistics, more production and a well-developed market and finally, consumers needed accessible, consistent supply and lower prices for the produce.

The study recommended government subsidies, education of consumers, and group certification for bridging some of the gaps in the chain. It also recommended that new firms should enter the sector to provide some of the services that are missing in the chain.

TABLE OF CONTENTS

DECLARATION	i
ACKNOWLEDGMENT.....	ii
ABSTRACT.....	iii
TABLE OF CONTENTS.....	iv
CHAPTER ONE: INTRODUCTION.....	1
1.1 Overview of Organic Agriculture	1
1.1.1 <i>Organic Agriculture: A Brief History</i>	1
1.1.2 <i>Principles of Organic Agriculture</i>	2
1.1.3 <i>Certification in Organic Agriculture</i>	4
1.1.4 <i>Benefits of Organic Agriculture</i>	4
1.2 Background	6
1.2.1 <i>Global Organic Market</i>	6
1.3 Problem Statement	13
1.4 Research Questions	16
1.5 Research Objectives	16
1.6 Purpose and relevance of the study	17
1.7 Organization of the study	18
CHAPTER 2: LITERATURE REVIEW	20
2.1 Introduction.....	20
2.2 Global tomato production and consumption.....	20
2.3 Tomato Consumption and Production in Ghana.....	22
2.3.1 <i>Tomato Consumption in Ghana</i>	22
2.3.2 <i>Tomato Production in Ghana</i>	24
2.4 Conceptual Framework.....	25
2.4.1 <i>Overview of the Value Chain Concept</i>	25
2.4.2 <i>Value Chain Structure</i>	26
2.4.3 <i>Value chain development</i>	28
2.5 Organic Vegetable Value Chain in China.....	30
CHAPTER 3: METHODOLOGY	34
3.1. Overview of the Method Section	34
CHAPTER 4: DATA ANALYSIS	39
4.1. Introduction	39

CHAPTER 5: CONCLUSION 52

 5.1 Introduction 52

 5.2 Conclusion..... 52

 5.3 Recommendation..... 54

References 55

Appendix..... 60

CHAPTER ONE: INTRODUCTION

1.1 Overview of Organic Agriculture

1.1.1 Organic Agriculture: A Brief History

Organic farming is the oldest form of agriculture in the world. It can be traced back to about 10,000 years ago when humans transitioned from hunting as a source of living to the production of plants and animals for survival (Francis & Van Wart, 2009). This method of farming depended solely on rainfall for irrigation; soil organic matter, plant residues and animal manures as sources of nutrients for the plants; and living organisms as pest control mechanisms. Organic farming was practiced worldwide until the second world war where technologies introduced were adopted into agriculture to increase food production (Delate, 2003).

The use of machines and chemical fertilizers during the war and times afterward, brought tremendous increase in food production. Up until today, this method of farming known as conventional or industrial farming contributes significantly to food production worldwide. The World Bank estimates that, about 70 to 90 percent increase in food production in recent times is attributable to conventional farming (Fisher, 2017).

Despite its vast contribution to food security worldwide, conventional farming poses many hazards to human health and the environment, due to poor practices such as excessive and inappropriate use of chemical insecticides and fertilizers. These hazards include destruction of soil quality, water pollution, destruction of the natural ecology; infliction of health problems on farmers and consumers; and reduction of food quality, taste and life span (Tal, 2018). With increasing global concern for environmental sustainability, organic

farming arose as a remedy for the problems caused by conventional agriculture (Brzezina et al., 2017).

1.1.2 Organic Agriculture Defined

Organic farming has received many definitions by many food-related agencies globally. One of the most comprehensible definitions was given by the USDA as "... [a] system which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc.) and to the maximum extent feasible rely upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection" (Meena et al., 2013).

This system relies mostly on on-farm inputs, and natural processes that reduces the harm caused to the environment in the process of production. It may adopt modern technology in production but ensures that the technology employed does not harm the environment. Hence, some form of modern agricultural practices such genetic engineering is not acceptable in organic farming because it constitutes synthetic input (Delate, 2003), which could have negative impacts on the environment.

1.1.2 Principles of Organic Agriculture

Organic farming is governed by four main principles which ensures that the environment is preserved in the course of food production. The principles of health, fairness, ecology, and care are the main guiding principles and are explained below as discussed by Meena et al. (2013).

The principle of health posits that, organic production ensures the protection of the health of humans and the environment. Organic agriculture is intended to produce high

quality, nutritious food that contributes to preventive health care and well-being and hence desists from the use of chemicals that such as fertilizers, pesticides, additives and animal medications that pose negative impacts on the health of humans and animals.

The principle of ecology requires that, production should be based on living ecological cycles and systems. Farm animals and crops should therefore be bred in their natural habitats and their natural cycles should be used in production and reproduction. Chemicals and other synthetic inputs should not be used to expedite production times for instance.

Principle of fairness admonishes that “[o]rganic agriculture should build on relationships that ensure fairness with regard to common environment and life opportunities” (p.8). Organic agriculture should ensure that there is fairness to all players in the value chain, including farm workers, processors, marketers, and consumers. This principle ensures that natural resources are used in the most just manner, both socially and ecologically, and in a way that preserves the environment for future generations.

Finally, the principle of care posits that “[o]rganic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.” (p. 8). This principle ensures that care is taken when adopting new practices and technology into production to ensure that the environment is protected.

“In a nutshell, these principles imply that the environment is preserved, farmers and workers have fair access to means of production while receiving a fair remuneration, and consumers have access to healthy diets composed of high quality food they can trust and buy at fair prices” (Brzezina et al., 2017).

1.1.3 Certification in Organic Agriculture

Organic farming is classified into two: certified and non-certified (Djokoto et al., 2016). Certified organic producers operate under the certification of an external body. According to (Latruffe & Nauges, 2014), certification is a pledge to comply by some standards of organic farming produced by both private and government institutions. The farm of the producer is audited as well as records of farming practices to ensure all standards of organic farming have been met before certification is granted. Certification makes the produce of the farmer more trustworthy, and it makes market access easier and helps to protect the producer from unfair competition (Kahl et al., 2012). Non-certified farmers on the other hand also known as agroecological farmers do not operate under any certification but produce food using natural methods. In most countries in recent times, the term “organic” is only permitted to be used for food produced by growers operating under certification (Delate, 2003).

1.1.4 Benefits of Organic Agriculture

Organic farming faces many challenges especially with production. Some of the challenges include more labor and skill requirement, high production costs, difficulty in obtaining and maintaining certification, low yields in some places and production is more time-consuming as compared to conventional farming (Meena et al., 2013; Armesto-lópez, 2008). Despite these challenges, organic agriculture is gaining grounds gradually, especially in developed countries due to the benefits associated with it. These benefits are either environmentally related or consumption related.

Organic farming benefits the environment by enhancing soil nourishment due to the preservation of soil microbes; reducing pollution of water bodies; and preserving the

ecological balance (Delate, 2003). For consumers, they are able to enjoy more quality food which is poison-free, tastier, more nutritious, have longer lifespan and less likely to lead to overweight (Meena et al., 2013). Also, organic feed given to farm animals helps to improve their fertility and immune system.

The advantages of organic agriculture make it a sustainable way of food production and hence can contribute significantly to the achievement of the Sustainable Development Goals (SDGs) (Schaetzen, 2019). According to Schaetzen (2019), there are eight SDGs that are strongly associated with organic farming, which are goals 2, 3, 6, 8, 12, 13, 14, and 15 which deal with zero hunger; good health and well-being; clean water; decent work conditions; responsible production and consumption; climate action; life below water; and life on land respectively. This method of food production has therefore been recommended to world leaders and some countries such as China invest significantly in the sector to ensure its development.

1.2 Background

1.2.1 Global Organic Market

The benefits of organic agriculture, especially to the environment and consumers has resulted in a growing demand for organic foods globally. This movement started with developed world is gradually picking up in developing countries (Meena et al., 2013). As at 2017, global market for organic farming stood at USD 97 billion which is a substantial growth from the less than USD 15 billion two decades ago (Willer & Lernoud, 2019). This represents a whopping 547% growth in the market sizes of organic food over 20 years, or a 9.8% average growth annually. This market is however hugely concentrated in North America and Europe which account for 90% of the global market for organic food (Willer & Lernoud, 2019).

Country wise, the US is the country with the largest share of the global market for organic foods. It accounts for 47% (USD 45.2 billion) of the total market for organic products globally. According to the United States Department of Agriculture (USDA), the market in the US has recorded double digits growth in many years since the establishment of national organic standards in the year 2000 (Greene & Wechsler, 2016). Today, organic produce are available in about 75% of conventional grocery stores, commanding premium prices over the conventional (USDA, 2019). Despite, the rapid growth in the US, organic produce still remains a niche market in the country. According to Gelski (2019), organic sales accounts for 5.7% of all food sales in the US. Also, only 39% of Americans say that most or some of the food they consume is organic (Funk & Kennedy, 2016). This however is still in a large number (about 127.608 million), considering the huge population size in

the US (327.2 million). This implies that organic foods are becoming known amongst people in the US.

The UK is another country that has recorded substantial growth in the market for organic produce in recent years. In the 2017 edition of the UK Soil Association's periodic report on the status of organic agriculture in the UK, relevant statistics and trends in the organic market in the country was discussed. Key statistics about the market is summarized as follows. From 2013 to 2017, the market recorded persistent strong growth and stood USD 2.6 billion, representing a growth rate of 7.1% from 2016. More supermarkets in the country now have organic products and many restaurants such as McDonalds offer organic menus. Many schools, hospitals, and workplaces also serve organic meals nowadays. The UK market is however small, compared to the US. It accounts for only 1.5% of the total UK food and drink market and 4% of the global market for organic foods. In the UK, organic foods tend to be more popular in England than other parts. For instance, 80% of consumers in England have some knowledge about organic foods and 39% buy organic on a weekly basis (UK Soil Association, 2017).

With the growing trend of the organic food market, there is a great shortfall in supply (Willer & Lernoud, 2019). There is therefore a huge potential for the organic market even though it is still a niche.

1.2.2 Global Organic Production

Due to the growing demand for organic foods worldwide, the production of organic food keeps recording a substantial growth to meet the increasing demand. From the graph below, it can be observed that the total land area under organic production has recorded

positive growth rates over the five-year period, with 2017 (the most recent year) recoding the highest growth rate, which according to Willer & Lernoud (2019) is the all-time high growth rate. Even though the growth rate declines in some years, especially in 2014, the trend shows a general increase in the growth rate.

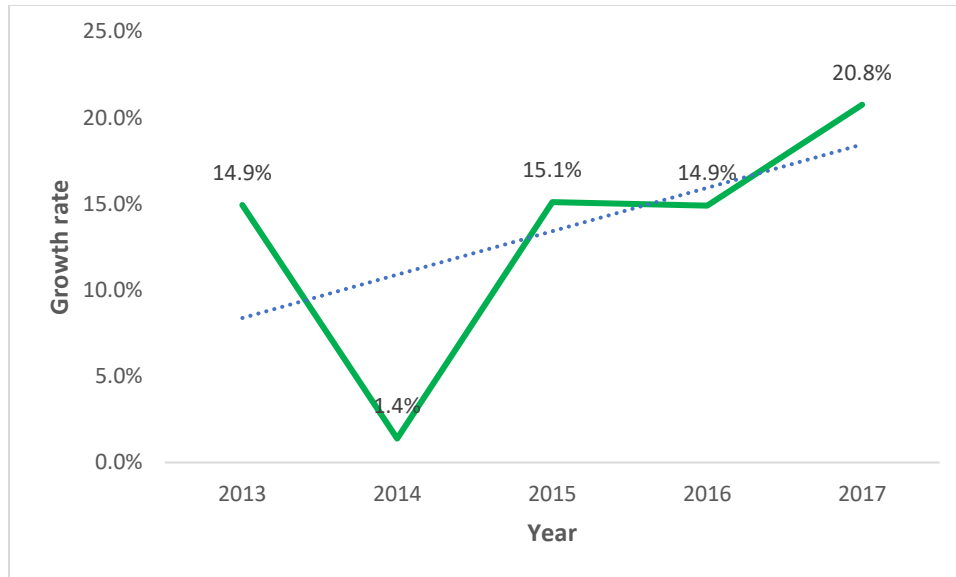


Figure 1: Global growth in organic land area from 2013 to 2017

Data source: FiBL & IFOAM – Organic International

The high growth recorded in 2017 was mainly due to whooping 8.5 million additional hectares reported by Australia (which is captured included in the Oceania region) (Willer & Lernoud, 2019). Also, all the world regions recoded a growth in the organic land area, contributing to the high growth rate. The growth of each of the regions as reported by Willer and Lernoud is shown below.

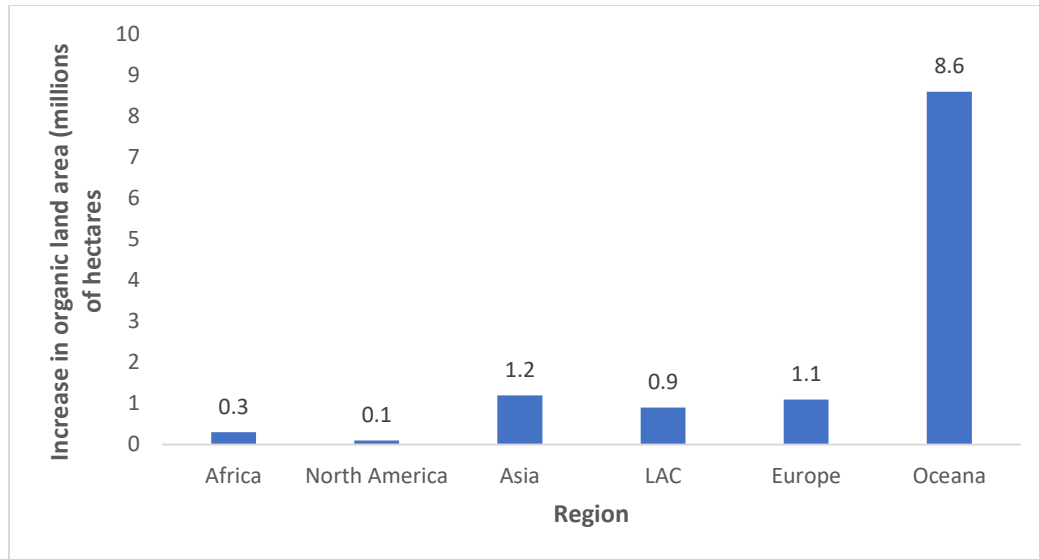


Figure 2: Regional increase in organic land area in 2017

Data source: FiBL & IFOAM – Organic International

In 2017, the total land area under organic cultivation (including in conversion areas) stood at 69.8 million hectares. Oceania, which is made of Australia, New Zealand and the Pacific Islands, is the region with the largest organic land area. It 35.9 million hectares, which is half of the total land area globally and 8.5% of the agricultural land area in the region (Willer & Lernoud, 2019). The case in Africa is quite paradoxical. The region has the largest number of organic producers (815,000) after Asia which has 1.1 million producers (Willer & Lernoud, 2019). The continent also is the second largest in the world by both land area and population and is the most reliant continent on agriculture. However, this continent has consistently recorded the smallest organic land area in the world. This implies that, development of organic agriculture in African is lagging and deserves some attention. These are the contributions of each of the regions as reported by Willer et al. (2018).

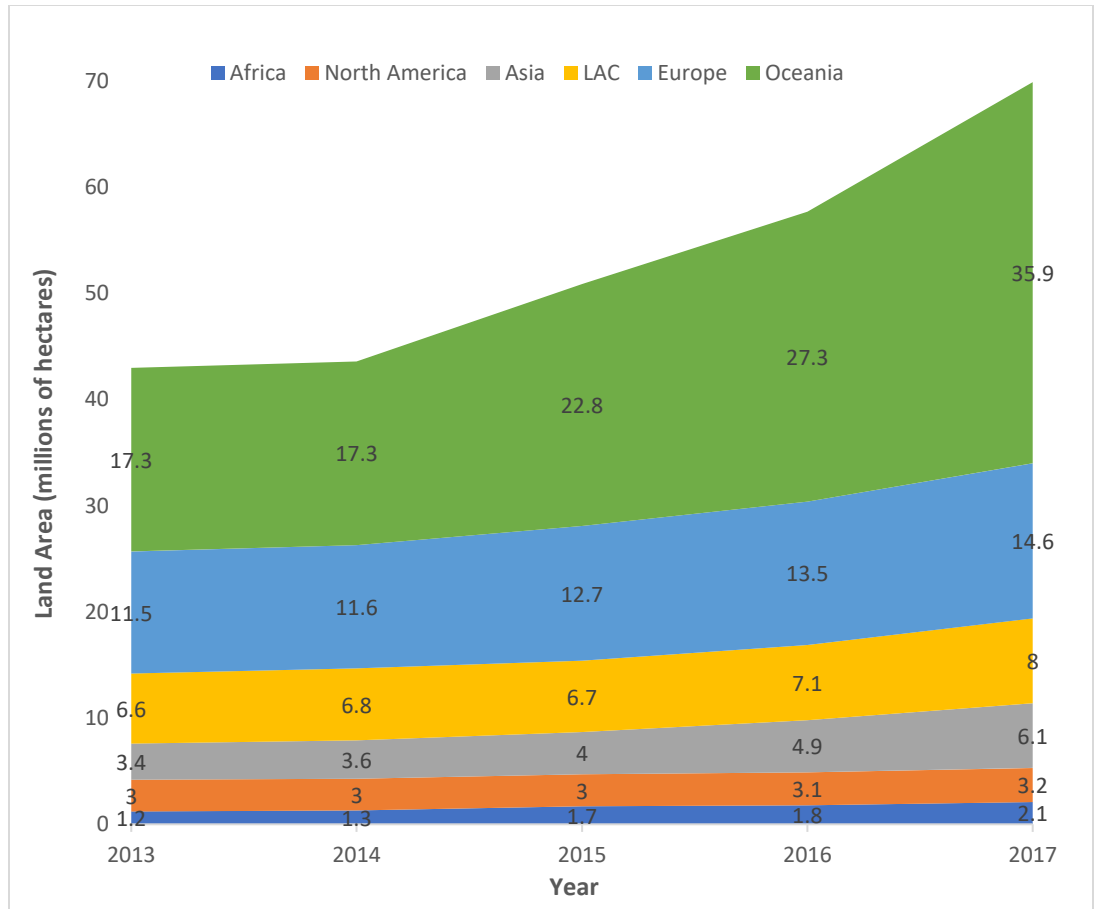


Figure 3: Regional organic land area from 2013 to 2017

Data source: FiBL & IFOAM – Organic International

1.2.3 Organic Agriculture in Africa

Agriculture in most African countries is considered organic by default due to the lack of synthetic agricultural inputs used in production (Osei-Asare, 2009). This form of organic farming is mostly uncertified and is meant for the domestic market. With certification becoming the standard for organic farming, however, uncertified production is not considered as organic and therefore not included in organic production by most international organic food bodies such as IFOAM and the FAO. Certified organic farming

is mostly practiced by producers who export their produce to foreign markets (Osei-Asare, 2009; Willer & Lernoud, 2019) to fill the huge demand gap in the European organic market (Barrett et al., 2001). The exportation of organic products encourages certified organic production in many African countries. However, with the exception of a few African countries such as Tanzania, Uganda, Kenya, South Africa and Egypt which are experiencing growth in the domestic organic market, most of the other countries lagging in the development (Willer & Lernoud, 2019) largely because very little attention is given to it. Organic agriculture receives little support from governments in Africa, leading challenges in production and marketing of organic products. “Organic agriculture is virtually absent in agricultural education, extension services, and R&D.” (UNCTAD, 2009). Most of the development programs in the sector has come from agribusinesses, private foundations and international organizations, mostly with the aim of exporting (de Bon et al., 2018).

In other continents, countries with more developed organic sector (as demonstrated by large organic markets and land area) has received significant support from the government to attain the current level. For instance, in the US, the government continuously provides funding for research and subsidies for certification of organic producers. More recently, the government supported organic agriculture with a total of \$867 billion, including research funding (Bialik et al., 2019). This has led to tremendous growth in the US organic sector, making it the largest in market size and the fifth largest in land area. Also, the organic sector in China, which ranks 3rd in both market size and land area, receives extensive support from the government to enhance both production and marketing. This support includes creation of awareness, research and development, loans with low interest

rates and subsidies for organic producers and building collaborative relationship between producers and wholesalers across the country. Every year, the government of China supports the development of the organic sector with approximately USD800,000 worth of funds and also subsidizes 60% of the cost of certification for producers (Wang, 2012).

Even the advanced countries, the development of the organic sector is greatly accounted for by external support, especially from the governmental support. It is evident that the development of the organic sector, which tends to be a young market needs external support. Therefore, without receiving any supporting, the organic sector in Africa would experience significant challenge in its development.

1.3 Problem Statement

Agriculture was considered organic by default in Ghana (even though most of the producers are not certified) due to the lack of synthetic inputs used in production (Osei-Asare, 2009). However, in recent times, due to the influx of agrochemicals coupled with government subsidies on agrochemicals for local producers, most farmers practice conventional farming to increase production. This has led to significant decline in organic land area in Ghana since 2013, as shown in figure 4 below.

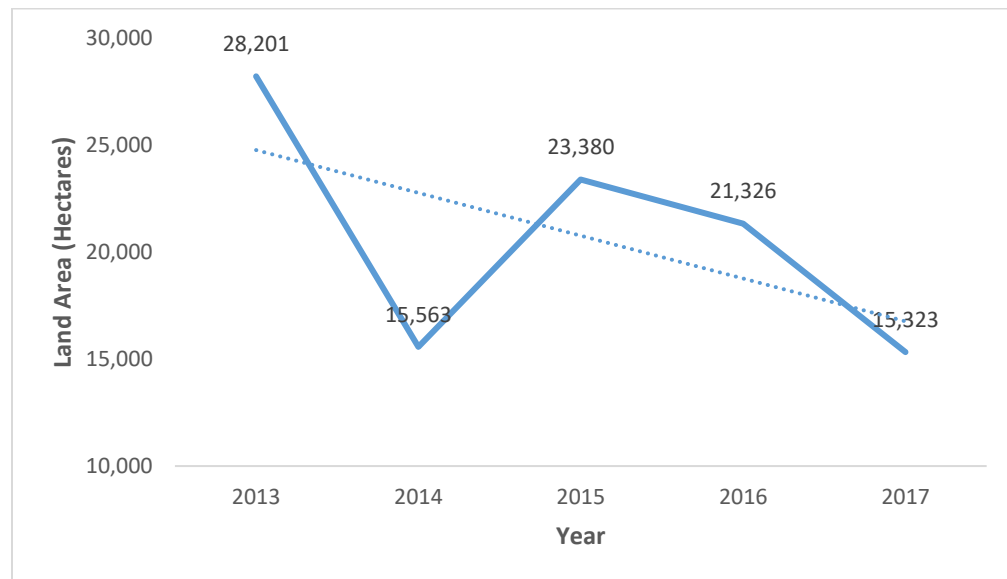


Figure 4: Organic Land area in Ghana from 2013 - 2017

Data source: FiBl & IFOAM Organics International, 2019.

Most of the farmers in conventional agriculture overapply or wrongly apply these chemicals on their farms due to lack of knowledge of usage and sometimes the desire to get quick harvest. Aside this contributing to the destruction of the natural environment and posing hazards to the farmers themselves, it leaves traces of the chemicals in the produce, which makes it toxic for consumption (University of Ghana, n.d.). The negative effect of

agrochemicals has contributed to the adoption and aggressive support of organic farming in most advanced countries but it is not the case in Ghana where farmers avoid organic agriculture because of the perceived high risk in the venture (University of Ghana, n.d.).

Even though the government plays very little role to support the development of the organic sector in Ghana, there are periodic conferences which are organized to discuss some of the issues in organic agriculture. For instance, the West African Organic Conference (WAOC) is held bi-annually in a selected West African country to address some of the challenges in the sector. The conference brings people from various fields such as academia, NGOs, the public sector and the players in the industry within and outside the continent to share knowledge, exhibit organic produce and create awareness to attract support from government and other stakeholder (FAO, 2019).

Organic agriculture faces significant challenges in Ghana which affects the rate of adoption amongst farmers. These challenges include lack of a well-defined market, high cost of certification (which is challenging as most of the producers are smallholders), low promotion of organic produce, lack of certified inputs and high cost of production (Knowledge and Skills Ltd. & MoFA, 2018). Due to the challenges faced by the organic sector in Ghana, most farmers do not find organic agriculture to be lucrative. The few farmers who go into the venture mostly produce for the export market, despite the willingness of some domestic consumers to pay premium prices for organic produce (Osei-Asare, 2009; Owusu & Owusu, 2014). In recent times however, the domestic market for organic produce is emerging in Ghana. Markets for organic produce such as the Larbone Green Market are opening up and some grocery stores such as Shoprite are now selling organic produce. More recently, there is the advent of a local restaurant called the N8tive

Bar, that serves organic meals and beverages to its customers. Despite these developments in the domestic organic market, the growth in the market is still very slow. It is therefore the aim of this research to find out why the development of the market is slow and some factors that can promote the development of the market.

1.4 Research Questions

To explore how the value chain for organic vegetables can be developed in Ghana, this study will seek to answer the following research questions:

1. What are the gaps in the development of organic tomato value chain in Ghana?
2. What are the roles of the various players in the organic tomato value chain and what are their needs?
3. What factors can promote the development of the organic tomato value chain in Ghana?
4. What factors can inhibit the development of the organic tomato value chain in Ghana?

1.5 Research Objectives

The main objectives for this study are to:

1. explore the features of a developed organic tomato value chain.
2. identify who the actors in a developed organic tomato value chain are and their specific roles and needs.
3. identify factors that can promote the development of the organic tomato value chain in Ghana.
4. identify factors that can inhibit the development of the organic tomato value chain in Ghana.

1.6 Purpose and relevance of the study

Demand for organic food is on the rise globally due to consumers concern for their health and the environment. However, this demand is not being fully met, especially in Ghana, due to the lack of a developed organic value chain in Ghana. The purpose of this research therefore is to explore ways in which the value chain for organic vegetables can be developed in Ghana to enable the supply meet demand.

The findings from this research would be relevant to the organic sector in various ways including.

1. Drawing the attention of the actors in the value chain to the full functions they are expected to play to ensure the smooth flow of produce from production till the point of consumption.
2. Drawing the attention of the appropriate institutions such as government, and financial institutions to provide supporting services for the chain actors to enable them to perform their roles effectively.
3. To reveal investment opportunities to potential investors and to attract donors into the sector to help develop it.
4. Provide information on challenges in the value chain for new incumbent firms to be better prepared for success.
5. Contributing to the limited research work performed on the organic sector in Ghana.

1.7 Organization of the study

This study has five chapters overall. Below is a summary of what each chapter entails.

Chapter 1: Introduction

This is the opening chapter of the research and lays the foundation for the entire work. It gives a clear overview of the concept of organic farming, and outlines the research problem, objectives and relevance of the study.

Chapter 2: Literature Review

In this chapter, the study reviews existing literature relating to the topic. It looks at global production and consumption of tomatoes to and identifies the global leaders in the production of tomatoes. It then looks production and consumption of tomatoes in Ghana to relay information about the tomato market in Ghana. Very importantly, the study looks at the concept of value chain and value chain development to identify the features of a developed value chain. China was identified to be global leader in both tomato production and organic land area. Hence, the chapter closes by studying the organic vegetable of Yangxian County in China, which served as a benchmark for accessing the level of development in the organic tomato value chain in Ghana.

Chapter 3: Methodology

This chapter outlines the methodology for the research. It looks at the study population, sample size, and the approach that this study takes to collect and analyze the data to achieve the objectives of the study.

Chapter 4: Data Analysis

In this chapter, the data collected from respondents is analyzed to be able to answer the research questions posted at the beginning of the study. The findings from the data analysis revealed the critical issues that needs to be addressed in the organic tomato value chain in Ghana to ensure its development.

Chapter 5: Conclusion

This is the closing chapter of the research and summarizes the findings of the entire study. It also gives recommendations for the development of the value chain based on insights gathered from previous chapters. It finally outlines the limitations of the study and recommends areas for further research.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter explores existing literature related to the study. It looks at tomato production and consumption at the global level and identifies the leading producers. It then looks at production and consumption in Ghana to find out the market potential for tomatoes in Ghana. The chapter also discusses the concept of value chain as the main conceptual framework for the research and then looks at the organic value chain as in China as a case study to identify shortfalls in the organic value chain in Ghana.

2.2 Global tomato production and consumption

Tomato is one of the most consumed vegetables worldwide. It is the second most consumed vegetable globally, after potato (Zoran et al., 2014). In 2017, total revenue from the tomato market globally amounted to \$228 billion, which is a 12% growth from 2016 and an annual growth rate of 3.7% from 2007 to 2017 (Louw, 2019). Tomato is used in the preparation of many different kinds of foods including fresh foods such as salads; cooked meals such as stew, and soup; and processed foods as ketchup, purees and canned fishes. It has high nutritional value and provides enormous benefits to the body. It is a great source of vitamins and minerals which helps in building strong bones and teeth; improving eyesight; boosting of the immune system; detoxification of the body; reducing of heartburn, indigestion and migraines; healing of wounds; and aids the rapid replacement of skin cells (Bhowmik et al., 2012). This makes tomato a key vegetable in building the body and ensuring its proper functioning. Tomato has also been found to aid the prevention of some serious diseases. Due to the presence of substances such as lycopene, bioflavonoids,

chlorine, sulfur, coumaric acid and chlorogenic acid, tomatoes help prevent various diseases such as cancer, cirrhosis of the liver, scurvy, high blood pressure and cardiovascular diseases, and aids in the treatment of diabetes and reduction of damage caused by smoking (Bhowmik et al., 2012). The large consumption of tomato coupled with its enormous benefits makes it one of the most important vegetables globally (Zoran et al., 2014; Louw, 2019).

Tomato has therefore received the attention of many farmers and become one of the most produced crops globally. It is produced in every continent of the world except Antarctica where the climate is very unfavorable to support its growth. (Zoran et al., 2014). Total production of tomatoes reached 182.3 million tonnes in 2017, representing 16.7% of total vegetable production worldwide and a 33% growth from 2007 (FAOSTAT, 2019). This makes tomato the most produced vegetables globally as shown in figure 5.

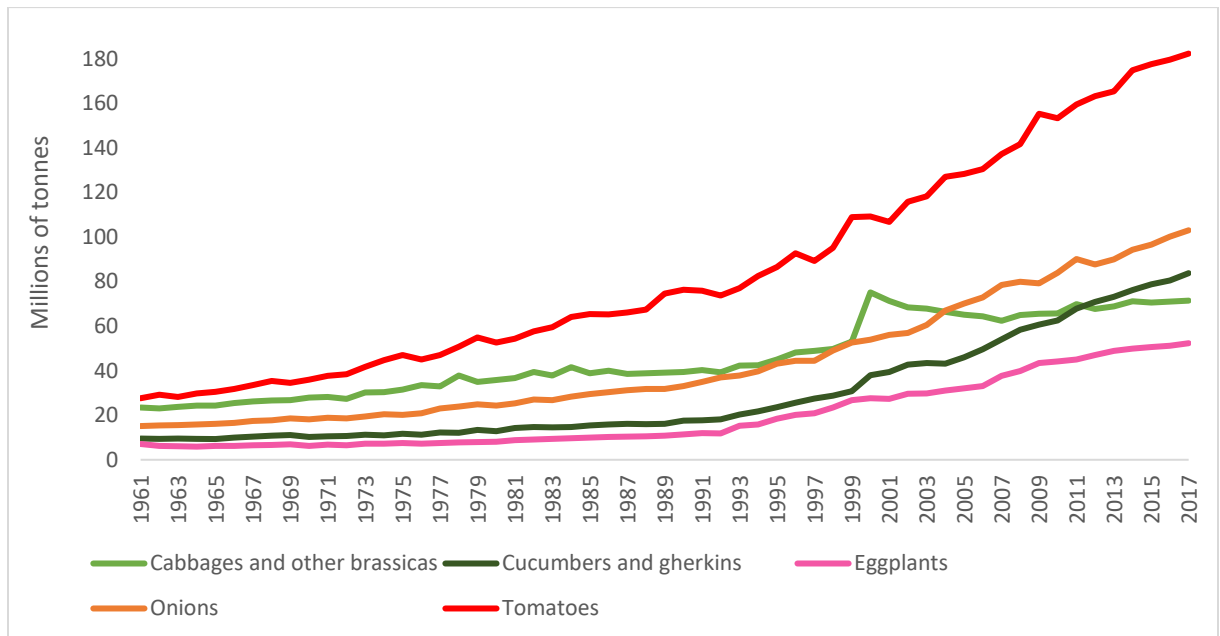


Figure 5: Five Most produced vegetables globally

Data Source: FAOSTAT

As at 2017, the leading producers of tomato globally are China, India, US, Turkey and Egypt. Amongst the five producers, the US has been the leading producer since 1961 until 1994, after which they were outpaced by China. The US has maintained an almost steady level of production with minor fluctuations. After 1995 however, tomato production in China saw a huge surge, making China the global leader of tomato production as at now.

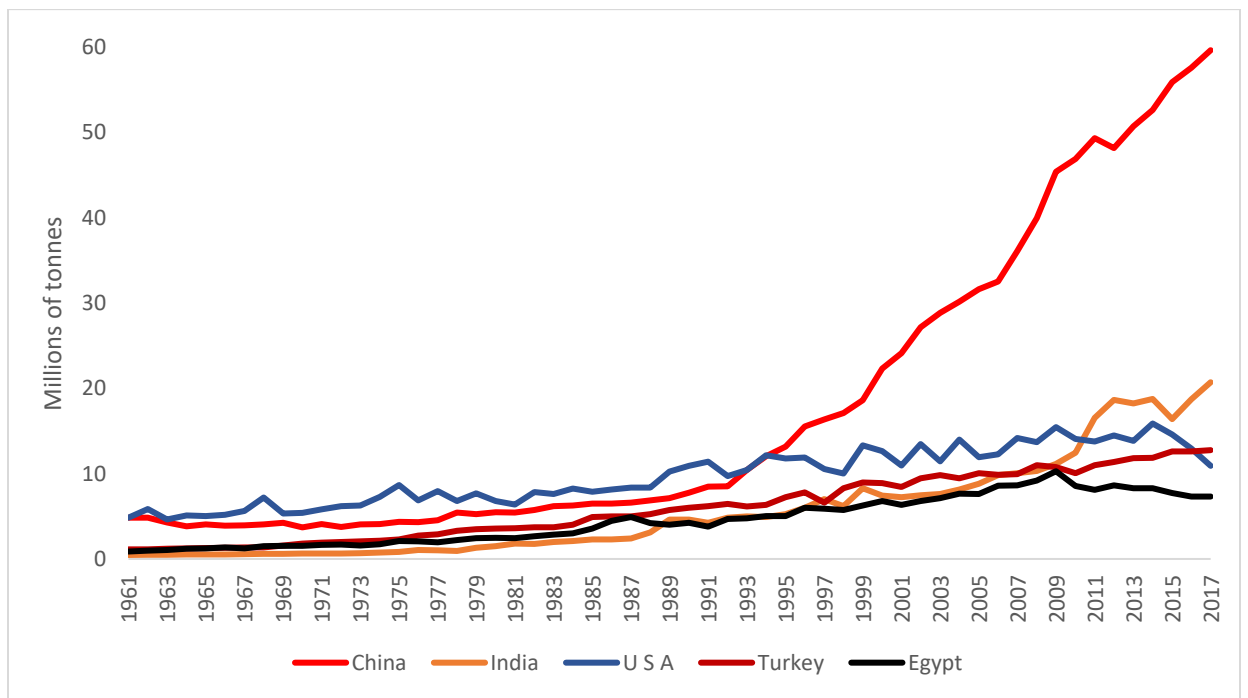


Figure 6: Top tomato producing countries

Data Source: FAOSTAT

2.3 Tomato Consumption and Production in Ghana

2.3.1 Tomato Consumption in Ghana

Tomatoes are very essential ingredients in the daily meals of the average Ghanaian. It accounts for 38% of the total vegetable expenditure in Ghana (Agyekum, 2015). Tomatoes can be grouped into two segments: fresh and processed and used in the preparation of cuisines such as soups, sauce and other dishes (DAI, 2014). Compared to other vegetables, it is used in large quantities in food preparation in Ghana (Adu-Dapaah & Oppong-Konadu, 2002). Consumption of tomatoes in Ghana is high and therefore, majority of what is produced in the country is consumed domestically (as is the case in for other West African countries) (Norman, 1992). According to Agyekum (2015), about 90% of tomatoes produced in Ghana is consumed domestically. Nonetheless, local production is inadequate and not able to match local consumption demand. Ghana therefore relies on other countries for the importation of both fresh and processed tomatoes. Fresh tomatoes are mainly imported from Burkina Faso and processed ones from China and Italy (DAI, 2014).

Importation of both fresh and processed tomatoes contributes substantially to tomato consumption in Ghana. As at 2014, imports accounts for about 30% of fresh tomato consumption in Ghana and they command higher prices than locally produced once as they are more productive, better tasting, less watery, have firmer skins and less seeds (Robinson & Kolavalli, 2010; DAI, 2014). Imports of processed tomatoes has also been substantial to local consumption. According to data from FAO, importation of tomato paste has been increasing substantially since the year 2000. The volume imported peaked at 109,513 tonnes in 2013 and declined slowly to 71,530 tonnes in 2017, as shown in figure 6 below. DAI (2014), estimated a Cumulative Annual Growth Rate (CAGR) of 38% from 2002 to 2012 for imported tomato paste. Tomato market in Ghana is therefore growing rapidly,

especially processed ones, due to an increase in fast food joints, restaurants, chop bars and population growth (DAI, 2014).

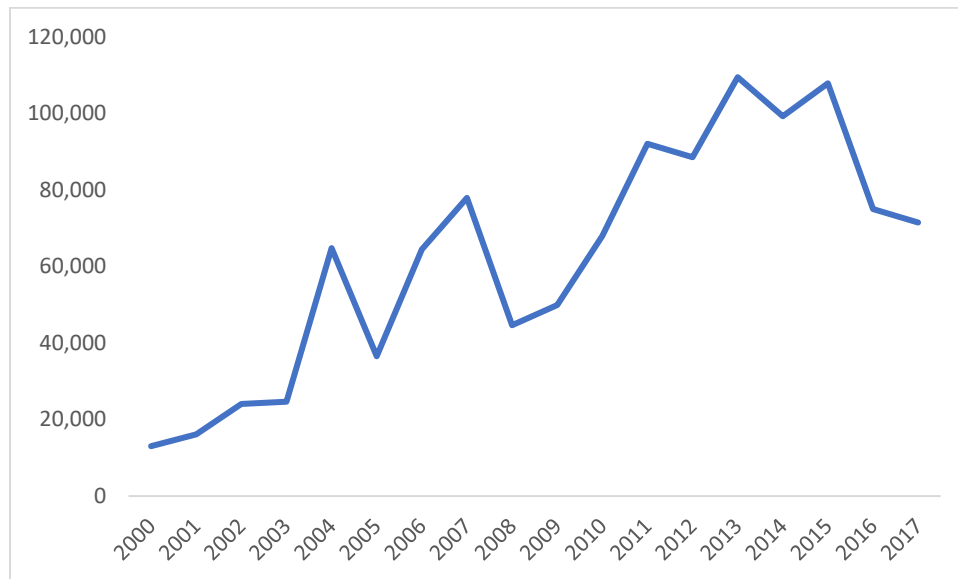


Figure 7: Import of tomato paste in Ghana (in tonnes)

Data Source: FAOSTAT

2.3.2 Tomato Production in Ghana

Tomato production in Ghana (just like many other vegetables) is largely carried out by smallholders in Ghana with very few large-scale commercial farms. Major tomato production are the three regions in the northern part of Ghana (Northern, Upper East and Upper West Regions) and three regions in the southern part (Ashanti, Brong Ahafo and Greater Accra Regions) (DAI, 2014). These regions have sandy loamy soils with a pH ranging between 6 and 6.5 and have temperatures ranging between 20 and 27 degrees Celsius which are favorable conditions for tomato growth. Tomato production in the

northern parts of Ghana and Brong Ahafo Region do have the highest yields per hectare and as such have the lowest cost per metric ton compared to the Greater Accra Region.

A large number of people are engaged in the tomato value chain in Ghana. As at 2014, an estimated of 90,000 farmers, 5,000 traders and 300,000 other individuals providing supporting services such as transportation were involved in the chain (DAI, 2014).

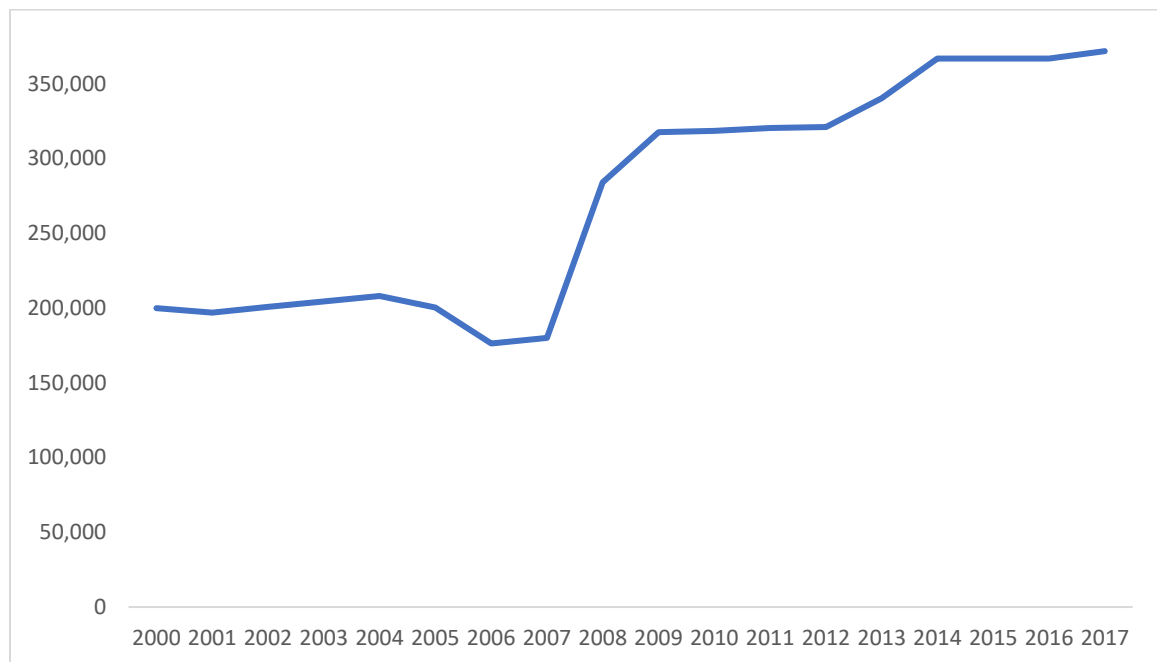


Figure 8: Fresh tomato production in Ghana (in tonnes)

Data Source: FAOSTAT

2.4 Conceptual Framework

2.4.1 Overview of the Value Chain Concept

Value chain is the framework that is widely used in analyzing the flow of products through various channels before reaching the final consumer. It was first introduced by Michael Porter in 1985 as a decision support tool to create value to customers (Kaplinsky

& Morris, 2000). Up until today, the concept has been widely used by numerous studies in various sectors to recommend ways of improving flow of products to satisfy the final consumer. “The value chain describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers, and final disposal after use.” (Kaplinsky & Morris, 2000). According to Russel & Hanoomanjee, (2012) “[a] value chain can be considered the linkage of all steps in production, processing and distribution of a product together, allowing the evaluation of each step, in relation to the previous and succeeding steps”. The value chain is made up of different stages and actors, and each stage contributes to the product by adding value. The actors build relationship amongst themselves and support each other to ensure the effective performance of the roles of the actors so that the ultimate consumer is satisfied. Each actor in the chain therefore is critical for the sustainability of the value chain as the absence or ineffectiveness of one actor can affect the performance of other actor(s).

2.4.2 Value Chain Structure

In its simplest form, a value chain is made up of four stages: product design and development, production, marketing and consumption and recycling (Kaplinsky & Morris, 2000). However, in the real world, value chains are more complex than this as there are external factors that affect the activities in the chain. Hempel (2010) identified many activities involved in a value chain and broadly classified them into four, namely, upstream, core activities, downstream and supporting activities. The upstream provides inputs for the

core activities and it includes input dealers and research institutions. The core activities encompass product design and development, production and marketing. The downstream deals with processing and transporting of the product to final consumers. Finally, supporting services encompasses organizations (e.g. the government) that create enabling environments for other actors to ensure they are efficient in their roles. Figure 6 below shows the extended value chain as derived by Hempel.

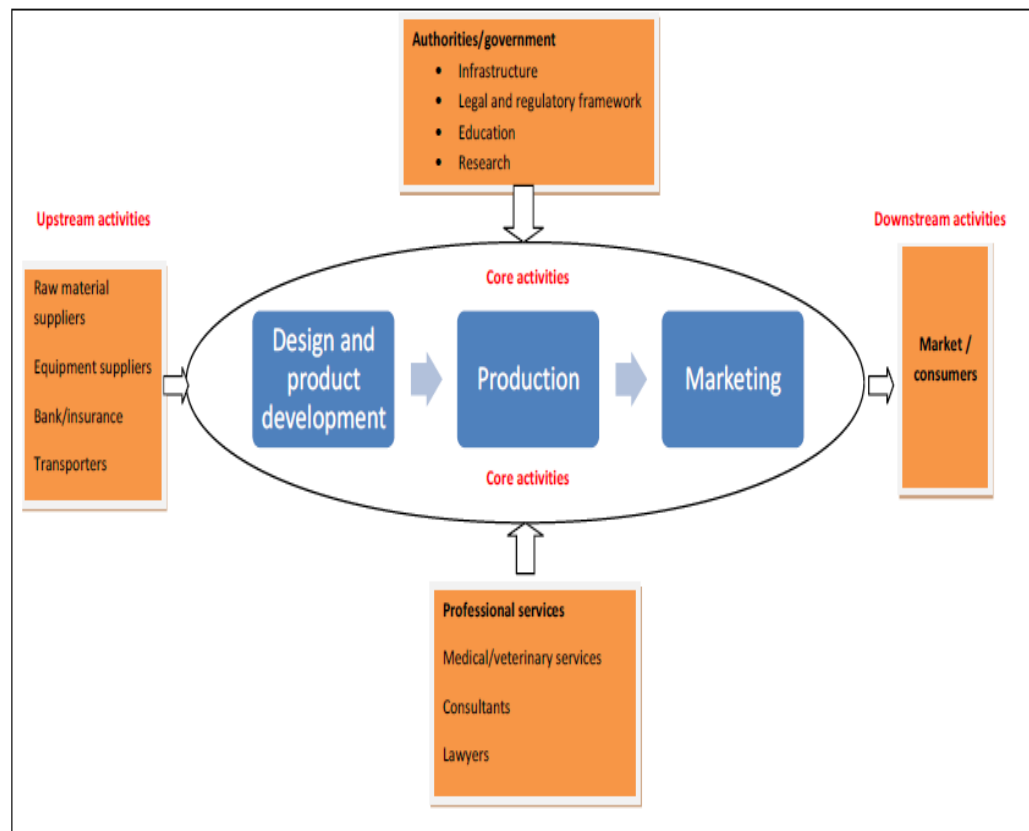


Figure 9: The Extended Value Chain

Source: Hempel, 2010

2.4.3 Value chain development

From the review of existing literature, no clear definition of value chain development was found. However, it can be inferred from literature that value chain development is the linking of actors in a value chain and building relationships amongst them so that each actor can efficiently perform their function so as to satisfy the final consumer. Value chain development is increasingly becoming a popular tool for the development of the private sector, and it used by many donor organizations (Stamm, 2011). The use of this tool begun in the 1990s in the developed countries but was adopted in developing countries much later. During these times, the developing countries focused their research on sectoral development which has several limitations in dealing issues affecting the sector. According to Kaplinsky and Morris (2000), value chain development approach makes it easier to interpret key indicators such as output, cost and sales in the sector; and uncover the dynamics of the flow of activities amongst the actors in a value chain, as opposed to sectoral analysis. Stamm (2011) also posits that, value chain approach facilitates the identification of barriers in the chain and opportunities for social and economic development. Given the effectiveness of value chain development over sectoral development, coupled with the desire of donors to understand how production and trade are coordinated, donors began pursuing value chain development for the development of the private sector. In supporting the development of value chains, donors have the main objective of addressing challenges in the value chain and making actors more active by focusing on four main area according to Humphrey and Navas-Alemán (2010).

1. Reinforcing the weakest link in the chain.
2. Enhancing the flow of knowledge and resources

3. Strengthening specific links between actors
4. Creating new links in the chain e.g. linking local firms to global chains.

Over the years, several UN agencies have used this approach to achieve their development goals (Stamm, 2011). In the past, development of value chains focused only on vertical linkages, which is the interrelation between actors at one stage of the chain and those in other stages (for example between producers and wholesalers or between retailers and consumers). However, Stamm (2011) and Mitchell et al., (2009) posits that, vertical linkages helps to identify weaknesses in the chain, it is not sufficient on its own for the development of value chains. To be effective, value chain development needs to also focus on creating other linkages which Stamm (2011) identified as follows:

Firstly, it should pay attention to creating horizontal linkages. Value chain development should ensure that a relationship be created amongst actors at the same stage of the chain, to make dealing with actors in other stages of the chain easier. For instance, collaboration amongst farmers can help ensure consistency in the supply of farm produce to other actors such as wholesalers. Secondly, development of value chains should also pay attention to supporting services. A more systemic view of value chain development needs to take into account not only the firms that are part of the actual core production chain, but also other actors that are impacting on the chain. “Successful promotion of value chains today depends on the integration of public and private service providers and on creating an enabling environment” (Stamm, 2011).

2.5 Organic Vegetable Value Chain in China

China ranks first globally not only in the production of tomatoes but also in the production of organic produce at least for the past decade (FAOSTAT, 2019). Also, it tends to have a very coordinated value chain that ensures smooth flow of organic produce from the producer to the consumer. This characteristic of their value chain reflects features of a developed value chain and hence, it is imperative that this research studies the organic value chain in China and uses it as a benchmark in identifying shortfalls in the organic value chain in Ghana. The following is the value chain for organic vegetables produced in the Yangxian County in China, according to Wang (2012). The chain consists of seven main actors and one actor (the government) playing supporting roles.

1. **Farmers:** Farmers identified in the county either embarked on their own organic venture (mostly uncertified) or worked for certified organic farming companies. The farmers main roles in the chain are production related (soil preparation, planting, irrigation, weeding, fertilization, and harvesting) and simple processing which includes sorting and packaging.
2. **Processors:** Most of the fresh organic vegetables produced are sold directly to the market with only a simple packaging. Only a small proportion, about 5%, is sent to processing companies for further processing termed as deep processing. Deep processing, which usually involves transforming the food into other forms and packaging them, is intended to prolong the life span of the food and make it have a nicer appearance.

3. Cooperatives: The major role cooperatives play in the chain in Yangxian is to test the produce of non-certified producers, buy them and sell to collectors or wholesalers and retailers.
4. Collectors: Collectors collect the produce from the farmers or the cooperatives and distribute to wholesalers and retailers.
5. Wholesalers: Wholesalers buy the produce from collectors for resale. The farmers also transport the produce to wholesalers within and outside the county.
6. Retailer/spot market: Retailers buy organic vegetables (usually from wholesalers and collectors), transport to their retail stores, grade, display and sell to consumers. There are a few retail stores in Yangxian, which buy about 5% of the total produce. There also exist the spot market or farmer market where non-certified producers sell about 20% of their produce directly to consumers.
7. Consumer: Consumers are at the end of the organic vegetable value chain. They purchase the produce usually from retailers at the final marked price. Due to relatively lower prices, non-certified organic produce has a larger market share than certified ones in the Yangxian County.
8. Supporting services: In China, almost all supporting services are provided by the government, hence other institutions provide very little supporting roles to the sector. The government creates an enabling environment by providing missing services to ensure the development of the sector.
 - (i) Policy: The government designs development programs such as the “Organic Food Industry Development Program for Reserved Zone of Crested Ibis in Yangxian County, Shaanxi Province” to create publicity, fund scientific

research among other things, with the aim of creating an enabling environment for the development of the organic sector. The government also gives subsidies and low interest loans.

- (ii) **Financial support:** Every year, the government gives out about USD 800,000 for the development of organic agriculture and also covers 60% of the cost of certification to encourage the farmers to apply for it. Finally, between 2006 and 2012, the government has invested USD 12.96 million to ensure the development of leading organic agricultural firms.
- (iii) **Marketing:** The government has created a collocative relationship between farmers from the county and wholesalers and markets in Beijing, Shanghai and other cities to promote the sales of the produce of farmers.

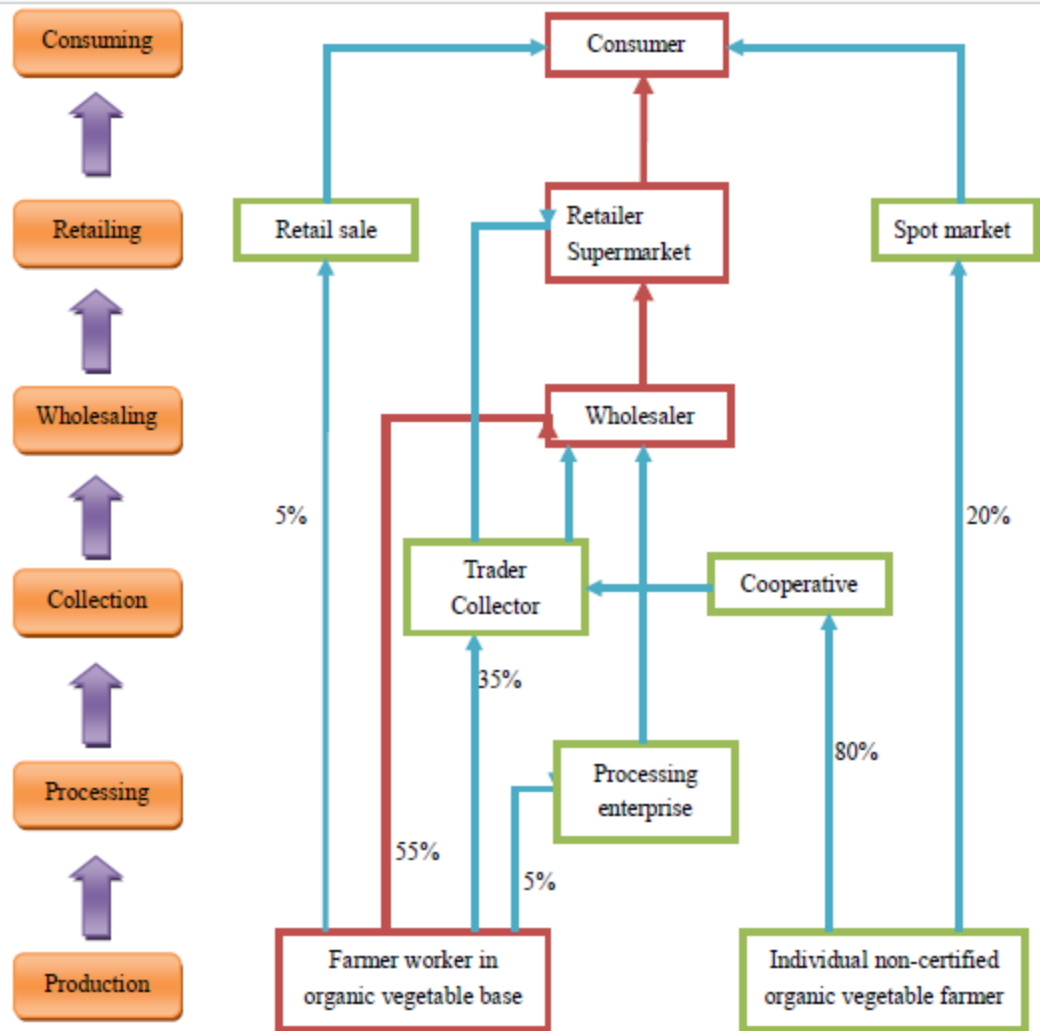


Figure 10: Organic Vegetable Value Chain in China

Source: Wang (2012)

CHAPTER 3: METHODOLOGY

3.1. Overview of the Method Section

From the review of existing literature, a huge challenge was identified about the organic vegetable value chain in Ghana. The chain did not appear to match a standard value chain; hence it was considered undeveloped. A field research was therefore carried out to find factors that inhibit the development of the value and explore ways in which the value chain can be developed. This chapter discusses the research design, research scope, population, sampling techniques, sample size, data collected, method of data analysis, the limitations, as well as the ethical considerations during the study.

3.2. Research Design

Research design is a plan that directs the researcher on how to go about the data collection, where and when to collect data to enable him or her answer the research questions of the study (Parahoo, 2014). This study took an explorative form as it tried to find out more about: the gaps in the organic vegetable value chain in Ghana; factors that inhibit the development of the chain; and factors that can promote the development of the chain.

The study employed the qualitative approach in its research. Qualitative research is a type of research that takes naturalistic approach to understand a phenomena in real world settings where the researcher does not manipulate the phenomenon of interest but allows it to unfold naturally (Dillon, 2003). This research approach does not rely on statistical procedure to arrive at its findings; and generalization of results is not the focus. This paper does not seek to make generalizations of results but to understand better, the challenges

that exist in the value chain and how those challenges could possibly be addressed to ensure the development of the value chain. Besides, previous work by Baan (2014) on the Value Chain of Chili Pepper in the Volta Region of Ghana and Wang (2012) on the Vegetable Value Chain in China employed the qualitative approach.

3.3. Research Scope

3.3.1 Study Population & Study Area

The study targeted organic food retailers in Accra for an interview after which some of the consumers who were present at the retail points were interviewed. For the producers, one of them was identified and after the interview, that producer helped in reaching out to other producers to interview. From the review of existing literature, 7 main groups of actors; input suppliers, producers, collectors, wholesalers, retailers, consumers and the value chain supporters; were identified. This study, however, wanted to involve four actors whose roles are considered the most crucial in the value. These four actors were envisaged to be able to provide information on the performance of other actors in the value chain. These actors are the farmers, wholesalers, retailers and consumers. However, during the data collection, no wholesalers were found, hence the remaining three actors (farmers, retailers and consumers) served as the study population.

The study begun with data collection, and in fact collect a large amount of its data from the Greater Accra Region. From existing literature, factors such as high educational level and middle to high income level are among the most important characteristics of organic consumers (Osei-Asare, 2009; Voon et al., 2011). According to the Ghana Living Standards Survey, Accra has the highest literacy rates and income levels as compared to

other regions in Ghana (GLSS 2014; 2018). This implies that, most consumers of organic produce in Ghana are residents of Accra.

3.4. Sampling Strategy, Techniques & Sample Size

The study adopted purposive and snowballing sampling to select participants for the research. Purposive sampling is a sampling method that uses the judgement of the researcher to select participants for the research based on certain criteria whereas snowballing is the sampling method that bases on referrals from prior participants to select the next participant for the research (Trochim & Donnelly, 2001). These techniques were chosen because the actors in the organic vegetable value chain in Ghana are not easily identifiable.

Organic vegetable retailers in Accra were identified through an online search and interviewed. After they were interviewed, they were asked for referrals to where they source their produce from (either wholesalers or farmers) and who their major buyers are. These people were then be followed and interviewed to get their perspectives on the existing nature of the value chain.

The choice of the sample size for the value chain actors selected for of this research was informed by existing works on Agricultural value chains. In Analyzing the Organic Vegetable Value Chain in China, Wang (2012), interacted with a total of 12 farmers (from 3 different farms), 3 wholesalers, 1 retailer and no consumer. Baan (2014), in his analysis of the Chili Pepper Value China in the Volta Region of Ghana, interacted 6 farmers, 2 wholesalers, 2 retailers and 2 consumers. This study therefore targeted 10 farmers, 5 wholesalers, 5 retailers, and 10 consumers, totaling 30 respondents, to get arrive a clear

pattern in the value chain. However, due the covid-19 situation coupled with the fact that the data was saturated, only 3 producers, 4 middle actors (retailers and distributors) and 5 consumers, (totaling 12 participants) were interviewed.

4.5. Data Collection & Procedure

The data for this study was collected through face-to-face interviews with respondents. However, in special cases where the researcher was referred an actor who is geographically very distant, and it was crucial to speak to such as actor, the interview was conducted through a phone call.

The interviews were conducted with a semi-structured questionnaire and notes of the responses would be taken. Interviewees were asked whether they are willing to participate in the research or not. The interview was only carried out when the interviewees agreed to participate. Audio recordings were also made of the interview only with the permission of the interviewees.

3.6 Data Collection Instrument for the Primary Data

As mentioned earlier, the interview was carried out using semi-structured questionnaires prepared by the researcher. This is because most of the interview questions are open-ended, to allow in-depth and thoughtful responses from the respondents.

3.7 Data Preparation, Collation and Processing

3.8 Data Analysis

Data analysis in qualitative research involves grouping of the data into themes and drawing patterns and relationships from the data (Cahalan et al., 2019). The data obtained

from the research was transcribed and the responses to the interview questions were grouped into similar themes to arrive at a clear pattern that exist in the value chain.

3.9 Ethical Considerations

Before the commencement of the filed research for the study, a proposal and data collection instruments were submitted to the Institutional Review Board of Ashesi University for approval, to ensure that the study meets ethical requirements of primary data collection.

In addition, the study did collect personal information of participants as this was not considered relevant to the data analysis and also, to ensure that the identities of participants are hidden. Finally, the research was only carried with the consent of the participants and audio recordings would be made with their permission.

CHAPTER 4: DATA ANALYSIS

4.1. Introduction

This chapter presents the findings that were obtained from the research. It analyses the data collected from the semi-structured interviews to answer the research questions that were raised earlier in chapter 1 of the study. The research questions raised were:

1. What are the gaps in the development of organic tomato value chain in Ghana?
2. What are the roles of the various players in the organic tomato value chain and what are their needs?
3. What factors can promote the development of the organic tomato value chain in Ghana?
4. What factors can inhibit the development of the organic tomato value chain in Ghana?

The chapter first talks about the results, which is a summary of the general observation or trends identified in the interviews and then talks about the discussion, which details the results and relates it to existing research.

As mentioned in chapter 3, the study intended to interview 10 producers, 10 wholesalers/retailers and 10 consumers to offer better insight into the situation in the value chain. However, due to the pandemic coronavirus situation which led to the temporary shutdown of economic activity coupled with the restricted movements of people in Ghana, the targeted number of respondents could not be reached. The study therefore interviewed 3 producers, 4 middle actors (2 retailers and 2 distributors) and 5 consumers.

4.2. Profile of Respondents

Gender Distribution of the Respondents

Except for consumers, all the actors interviewed worked for a business entity rather than working on their own. Most of the retailers and distributors interviewed have production unit in the same business, making many of the organic producers a forward-integrated business. One out of the consumers interviewed, was a restaurant business that mostly uses organic produce to prepare its meals. The following table shows the gender distribution of the respondents of the research.

Table 1: Gender Distribution of Interview Respondents

Actor	Male	Female	Total
Producers	3	-	3
Wholesalers	-	-	-
Retailers	-	2	2
Distributors	2	-	2
Consumers	1	4	5
Total	6	6	12

Source: Author's field research, 2020

Social Status of Respondents

The respondents of the research appeared to be quite educated and could speak good English, making all the interviews possible in English. The producers to have some level of tertiary education and have good technical knowledge in agriculture. The retailers and distributors also appeared to have attained some level of tertiary education. Even though

only 40% of the consumers interviewed are foreigners, most of the consumers of the retailers interviewed were foreigners and a few are local Ghanaians who belong to the middle or upper class or are expatriates. Even though consumers appeared to be high income earners, they mostly complain about the prices of the organic produce that they buy. They consumer have the view that the prices of the produce are too high and sometimes it does not match the quality that they get.

Geography of Respondents

The retailers interviewed operate their business in the La Dade Kotopon Municipal District of Accra is most of their reside in the district or in cities close to the district. One of the retailers operate their farmer's market at Cantonments and the other carry out their business at the Labone Green Market which is a market where organic vegetables and organic products are sold. The farms where the retailers source the produce are in the Eastern Region, especially, the Akuapem South District.

4.3. Results

Gaps in the development of organic tomato value chain in Ghana

From the analysis of the results from the data collected, there are gaps in the organic tomato value chain in Ghana, which interrupts the smooth flow of organic tomato from the producers to the final consumers. The gaps identified in the chain are missing or weak actors or services are categorized into three as follows:

1. Input suppliers

2. Supporting services
3. Organized market

Roles and Needs of the Players in the Organic Tomato Value Chain

The main actors identified tend to have a good idea of what roles are expected of them and do their best to perform those roles. However, actors are faced with many challenges that affect their ability to effectively play their roles in the chain. The needs of each group of actors interviewed are as follows:

Needs of Producers

1. Availability and affordability of inputs.
2. Proper infrastructure
3. Affordable certification
4. Subsidies
5. Education of consumers

Needs of Wholesalers and Retailers

1. Logistics
2. Increased production
3. Marketing

Needs of Consumers

1. Accessibility of organic produce
2. Trusted production (certification)
3. Consistent supply.

4. Reliable delivery services
5. Increased variety
6. Reduced prices

Factors can promote the development of the organic tomato value chain in Ghana

1. Organized market
2. Certification
3. Education of consumers
4. Supporting services
5. Availability of certified input dealers.

4.4. Discussion

The semi-structured nature of the interview helped to provide further insights into the issues that the organic tomato value chain Ghana, by asking probing questions and follow-up questions. This sub-section looks at the detailed responses of participants in answering the research questions.

Gaps in the development of organic tomato value chain in Ghana

The organic tomato value chain (even the organic vegetables in general) appear to have many gaps. From the data collected, the only actors that are active in the value chain are the producers, distributors, retailers and consumers. The value chain lacks middle actors such as processors, cooperatives, collectors, and wholesalers that were identified in the value chain in China. However, these missing actors is not a strong factor that can inhibit the smooth flow of organic tomato from the producers to the consumers. The core activities

in a value chain are product design and development, production and marketing (Hempel, 2010). And the above-mentioned missing actors in the value chain in Ghana only help with marketing of the produce which the retailers can carry out since there are fewer organic tomato producers in Ghana compared to China. Moreover, the presence of too many middle actors in a value chain raises the price of the product, since each of the actors would add their margin to the product's price, hence, the product becomes more expensive for the final customer (Cuddeford, 2014). Hence, the organic value chain in Ghana is a rather simple chain as shown below in figure 11 below.

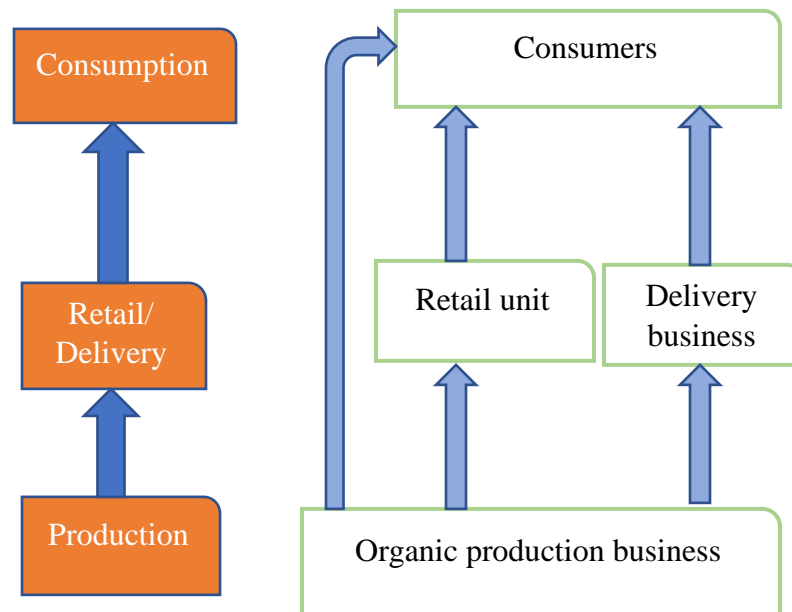


Figure 11: Organic Tomato Value Chain in Ghana

Source: Author

Though there appears to be little interruption in the core activities in the value chain, the chain faces two critical issues, one of which is a weakness in the chain (lack of an organized market) and the other is missing services (input dealers and supporting services). These issues are discussed in detail below.

1. Lack of an organized market: The organic sector in Ghana does not seem to have a very organized or developed market. The main issue with the market is that actors at one stage of the chain find it difficult in locating actors in the next stage. That is, consumers find it difficult locating producers or sellers and producers also find it difficult locating buyers for their produce. Even though some producers supply to consumers (mostly households food businesses) directly, most producers have forward integrated their businesses to have their own retail centers where they sell the produce to consumers. Hence the challenge in finding buyers lies less at the production side but at the retail side. Sellers currently use their own marketing efforts to convince the consuming populace to buy, since the food market in Ghana is not organic friendly. The sellers therefore use marketing campaigns, social media, posters, and some have websites that advertises and educates the populace on the importance of organic.
2. Input suppliers: Sourcing of organic inputs is one of the major issues that the production point of the organic value chain in Ghana faces. Organic inputs are scarce in Ghana and very expensive to purchase. From the interview, it was revealed that, there was no certified organic input dealer in Ghana. However, some of the dealers of conventional inputs have organic inputs that they sell to the farmers. Some farmers, however, find it difficult to trust these inputs as some input dealers deceitfully sell inorganic inputs as organic to farmers. Hence, many of the farmers have adopted some strategies to deal with this challenge, such as manufacturing their own fertilizers and insecticides through natural materials,

applying organic by default technique to inorganic seeds and some farmers importing organic inputs themselves.

3. Supporting services: Supporting services are lacking in the organic sector in Ghana. Respondents were asked how accessible the following supporting services are to them: (i) government e.g. subsidies; (ii) extensions services; (iii) financial services; (iv) commercial transport.

Almost all the respondents confirmed that supporting services are inexistent in the chain.

The lack of supporting services is a major hindrance for the development of Ghana's organic sector. The sector is young and lacks the necessary resources and services to ensure its development. However, all the available support for agriculture sector in Ghana is rather lent to the inorganic sector alone. For example, government provides subsidies on inorganic fertilizers for conventional farmers in Ghana. Also, financial services shun giving credit to organic actors with the excuse that organic farming is too risky, hence organic actors are more likely to default on the payment of loans. Without receiving support, it would be difficult for the organic tomato value chain in Ghana to develop. This is because, many countries including China have been able to develop rapidly because of the extensive support the sector receives. For instance, in China, the government offers various supporting services including research and development, financial and marketing. This has seen China's organic rise significantly over the past decade. Currently, China ranks third globally in terms organic land area and fourth in terms market size.

Roles and Needs of the Players in the Organic Tomato Value Chain

The actors interviewed tend to have a good idea of their expected roles in the chain. For instance, the producers do simple processing (cleaning) of the produce after harvesting before taking them to the retailers or delivering them to customers; and retail centers sort the produce according to sizes and packages them before selling. The actors, however, sometimes find it challenging to effectively carry out their expected roles in the chain due to some needs that are currently not being addressed properly. The main needs that of concern to the actors are discussed below.

Needs of Farmers

1. Availability and affordability of inputs: As mentioned earlier, availability and affordability of organic inputs such as seeds, fertilizers, and pesticides remain a top concern for most organic tomato farmers in Ghana. Even, though some farmers have tried to adopt some techniques to reduce the weight of the problem, it remains one issue that they mostly cry for help. This is because, without organic inputs, the work of organic farmers becomes more difficult. For example, the absence of organic pesticides leaves crops at the mercy of pests and insects, who feed on the crops and destroy them. This results in loses by organic tomato farmers which further discourages them from fulling practicing organic production.
2. Affordable certification: Certification cost is another issue that organic tomato farmers in Ghana battle with. As mentioned earlier in chapter 1, certification boosts

consumers' confidence in the produce of the farmers. Many of the consumers interviewed said that they sometimes find it difficult to trust the produce of some organic farmers. Therefore, there is the need for organic farmers in Ghana to be certified so that consumers can trust their produce. However, the cost of certification is very expensive for the smallholder organic farmers, and hence most of the organic farmers who produce for the domestic market are not certified. The farmers therefore need an affordable certification, or they need support to be able to afford the cost of the existing certification.

3. Proper infrastructure: Infrastructure is another challenge for not just organic producers in Ghana, but farmers in general. Infrastructure such as roads have received very little attention for a very long time now. The roads leading to some farming communities and most farms are in a deplorable state. This makes transportation of farm produce from the farm very challenging. Sometimes, some commercial drivers refuse to drive to some farms to transport the produce because of bad roads. This sometimes makes the produce of farmers rot on the farm. Some farmers, however, use their own vehicles to transport the produce from the farm and due to bad roads, the cars break down often. Hence they use a lot of their proceeds from selling on maintaining their vehicles.

Needs of Retailers and Distributors

1. Logistics: Logistics is a major issue that retailers and distributors in the chain battle with. These actors mostly lack storage facilities to store the produce during transportation and after the produce is finally in their custody to ensure that the produce last without going bad. The distributors also complain about their inability

to raise funds to purchase their own vans for delivery. They therefore rent commercial cars to do their deliveries which drains their profits away since the cost of renting these cars are very high.

2. **Increased production:** Current production levels of organic tomato in Ghana is low due to few producers in the chain. Due to the low supply, there prices of the produce are usually too high for the consumers. The retailers therefore suggest production should be increased so that there would be more supply of the produce which will eventually drive down prices for the consumers to be able to afford the produce.
3. **Marketing:** Marketing is a major challenge faced by retailers of organic produce in Ghana. Retailers in the sector find it difficult to get customers for their produce and consumers on the other hand also find it difficult to locate sellers. This problem arises mainly due to a lack of information about sellers.

Needs of Consumers

1. **Accessibility of organic produce:** Consumers said they find it difficult to access organic produce in Ghana. This is mainly due to limited producers and sellers in the country. Consumers therefore visit the few sellers they know in order to buy and when they do not get it from these sellers, they find it difficult to source it elsewhere.
2. **Consistent supply:** The consumers complained that they do not get consistent supply of organic tomato. Due to the principle of ecology which posits that production should follow the natural cycles in organic farming, farmers are not able to cultivate the crop when it is out of season. Hence, consumers get to consume

tomatoes only when it is in season. Consumers therefore have to stay without it or substitute it with inorganic ones when tomato is out of season.

3. **Reduced prices:** Almost all the consumers interviewed complained about the prices of the organic tomato that they buy. They said the prices of organic produce in general are very high and sometimes do not match the quality. According to the producers and retailers, the high cost of organic produce is mainly due to the high cost of production borne by the producers. This findings however contradicts the findings of Owusu and Owusu (2014), who found that consumers in Ghana are willing to pay premium prices for organic produce. This deviation occurred because their findings was a hypothetical situation where they asked consumers whether they would like to purchase organic lettuce at a 10% premium. In this study however, it was consumers who currently buy the produce that were interviewed. In addition, at the retail centers visited for this research, some produce had as high as 100% premium over inorganic ones. This is mainly because the retailers operated at high end residential areas; hence their prices would go up as they would have high operating cost like rent of space etc.

Factors can promote the development of the organic tomato value chain in Ghana

From the issues identified in the value and the suggestions made by actors in the chain, the following are some factors that can help develop the organic tomato value chain in Ghana.

1. **Organized market:** There should a developed market for organic tomatoes in the country. This can be done by making information about the various actors especially, producers, retailers and distributors available, to make it easier for consumers to locate them.

2. Certification: The cost of certification should be reduced or partly absorbed by an external body such as the government to encourage the producers to apply for certification. This would boost consumers' confidence in organic produce cultivated in Ghana and hence encourage them to buy.
3. Education of consumers: When consumers clearly understand organic agriculture and its importance, they are more likely to buy more of it. Therefore, the consuming populace should be educated to understand the idea of organic.
4. Supporting services: Supporting services such as financial services and extension services helps actors in the chain to be more effective. Therefore, the government and various institutions in Ghana (e.g. banks) should lend their support to the organic sector to ensure its development.
5. Availability of certified input dealers: The absence of certified input dealers in the country makes it challenging for producers. Hence, there should be certified input dealers in the country to provide farmers with certified organic inputs.

CHAPTER 5: CONCLUSION

5.1 Introduction

This is the final chapter of the study and it gives a snapshot of the previous chapters as well as recommendations for the relevant stakeholders to improve the organic tomato value chain in Ghana.

5.2 Conclusion

It was observed that, despite the growing trend of organic agriculture in many countries, especially the developed ones, the sector in Ghana (and other African countries) lagged in terms of development. This study was therefore meant to find out the factors are affecting the development of the organic tomato value chain in Ghana and how the development of the chain can be promoted. This study selected organic tomato for its research since it is the most consumed vegetable in Ghana and selected the Greater Accra as the start off point for its research since the residents in the region are shown to have some crucial characteristics of organic consumers. The study used the qualitative approach and collected primary data from participants using interviews. The following are the key findings from the study.

A positive trend was observed in organic agriculture in many countries of the world. Due to environmental and health concerns, many consumers in some countries are shifting their consumption to organic products. Hence the organic sector of many countries, especially developed ones, have enormous support, especially from the government to ensure the development of the chain. This has made the chain in some countries such as China a developed one. In most Africa countries however (especially Ghana), the sector

receives very little or no support from the government or elsewhere, hence their organic value chains lag in its development.

A review of the value chain concept has shown that, a standard value chain has its upstream activities (e.g. input supply, equipment suppliers etc.), core activities (made up of product design and development, production and marketing), downstream activities (i.e. consumption) supporting services which is divided into government and professional services (Hempel, 2010). From the study conducted, the organic tomato value chain in Ghana lacked in some parts of the chain and was weak in others. The chain lacked mostly in upstream activities (especially input supplies) and supporting services. Almost all the farmers interviewed said that input supply is major issue that they face in their organic venture. There are no certified organic input dealers in country, hence the farmers source their inputs from some conventional stores. Farmers however have a challenge trusting these input dealers as some deceitfully sell inorganic inputs to farmers as organic inputs. Also, all the actors interviewed (farmers, retailers and distributors) said that supporting services are lacking in the value chain. All supporting services such as financial services, extension services and government subsidies are all targeted towards the conventional farming to the neglect of organic farming. Aside the missing services, the chain was found to be weak in some areas such as marketing. Producers, retailers and distributors mostly find it difficult to find consumers. Consumers on the other hand also find it difficult to locate sellers, mainly due to a lack of information about sellers.

The study also found out that, even though the actors interviewed tend to have a good idea of what their expected roles in the value chain are, they are however, not able to fully perform their roles due to some needs that they have as actors that are not being met. The

top three needs of the farmers are access to proper infrastructure, and affordable input supply and affordable certification. The retailers and distributors mostly said they needed logistics, more production and a well-developed market for organic produce. Finally, consumers complained about accessibility of organic produce, consistent supply and lower prices for the produce.

5.3 Recommendation

Comparing the literature review and findings from the study, the following are recommended to help the development of the organic tomato value chain. First, the government should intervene in the chain. There are many roles that the government can play in the value chain. These include funding research into organic farming, giving subsidies on organic inputs, and providing extension services. This would help to reduce production cost for farmers and encourage more farmers into organic which increase production and subsequently lower prices of organic produce in Ghana. With regards to certification, the farmers can practice group certification, which is a system whereby stallholders in an area come together to apply for one certification. This would be a huge cost savings for the farmers as it has done for many farmers in countries that encourage this idea. Also, consumers should be educated on the benefit of organic to improve understanding of the sector and subsequently boost demand. Finally, private firms should be set up to provide some of the missing supporting services such as input supply and financial services.

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Appendix

STATEMENT OF INFORMED CONSENTFactors Affecting the Development of the Organic Tomato Value Chain in Ghana

This study aims at finding the gaps in the organic tomato value chain in Ghana and identify factors that can promote the development of the value chain. Your participation in this research will contribute immensely at achieving the objectives of this study.

This interview would take approximately **20 minutes** of your time. There are **no risks involved** in participating in this research. Please note that **participation in the research is not mandatory** and you may withdraw from the interview process at any point in time without any negative consequences. Also, feel free to ask for clarifications for anything you are not clear on.

Any information collected would be kept confidential and individual responses would not be communicated but rather common responses given by all participants. **Any audio recordings made of the interview would be deleted after the data has been transcribed.**

There are no direct rewards for participating in this research, but your participation can help us arrive at critical issues in the value chain which can draw the attention of relevant stakeholders to play their roles to ensure the development of the value chain. A presentation of the findings from this study would be made in April 2020. If you wish you wish to be present at the presentation, kindly inform me in advance. Also, if you would like a copy of the findings, kindly provide your email address/

WhatsApp

number:.....

This research protocol has been reviewed and approved by the Ashesi University Human Subjects Review Committee. If you have questions about the approval process, please contact Chair, Ashesi University HSRC, through irb@ashesi.edu.gh.

For further information, kindly contact me on +233 55 839 8129 or WhatsApp +233 56 005 9087 or email daniel.mensah@ashesi.edu.gh or you may contact my supervisor, Dr. Kwami Justina Morris via email: kjmorris@aucampus.onmicrosoft.com

Agreement

If you understand the purpose of this research and wish to participate, please say '*proceed*' else say '*do not proceed*'.

Interview Guide for Producers/ Farmers

1. So how long have you been doing organic tomato farming?
2. Kindly walk me through the steps you go through from the time you get the farm inputs till the time you harvest and sell.

*Hint: response should touch on **input sourcing, planting, weed and pest management, fertilization, harvesting, sorting/packaging, selling***

3. How do you source for buyers for the produce?

*Hint: Any form of buyer arrangement? Any **aggregator models, offtakes or cooperatives** that help them sell?*

Skip if answered in Q2

4. What are some of the things that go well, or you are happy about in this venture?
5. What are some of the things that do not go well (challenges/things that make it difficult for you as a farmer)?

*Hint: challenges with **input sourcing, production, selling, funding,***

Skip if answered in Q2

6. What are some of the things you need to effectively carry out your production?

*Hint: **inputs supply, training/capacity building/ information on production, extension services, funding** etc.*

7. What kind of information do you receive about your tomato production business and from whom?

E.g. about *price, varieties* to plant, *market trends, climatic info, financing* (loans etc.)

Hint: *Info from other actors – input suppliers, wholesalers/retailers, consumers*

8. How does the information you receive help you improve your business?

E.g. *On a scale of 1-5, how useful is the information you receive from actors mentioned in Q7*

Hint: *Should touch on all the actors mentioned in Q7*

9. Which actors are you in direct contact with? E.g. buyers, input sellers etc.

10. How do you collaborate with other organic vegetable farmers?

Hint: *farmer's union, sharing of knowledge, tools & equipment, conferences*

11. How accessible are supporting services to you?

Hint: How often do you use the following services? (If you don't please explain why)

Financial services such as banks

Extension services

Commercial transport (how challenging or accessible it is)

Government financial support (subsidies, input supply etc.)

12. Is there anything you would like to add or ask with respect to this study?

Hint: Any pressing issue that I didn't ask

Interview Guide for Wholesalers and Retailers

1. So how long have you been doing wholesale/retail of organic tomato?
2. Kindly walk me through the steps you go through to get the organic tomatoes and sell them off.

Hint: response should touch on sourcing of tomatoes (any supply arrangement?), transportation, sorting/packaging, storage, and sourcing of buyers).

**Supplier arrangement – fixed supplier? Advance payment/ credit purchases?*

3. How do you find buyers and sellers?

Skip if answered in Q2

4. What are some of the things that go well with this venture/ that you are happy about?
5. What are some of the things that do not go well (challenges/things that make it difficult for you as a wholesaler/retailer)?
sourcing of tomatoes, transportation, sorting/packaging, storage, and sourcing of buyers, financing.

Skip if answered in Q 2

6. What kind of information do you receive from sellers (producer/wholesaler) and buyers?

Hint: variety etc.

7. How does the information you receive help you improve your business?
E.g. *On a scale of 1-5, how useful is the information you receive from actors mentioned in Q7*

Hint: Should touch on all the actors mentioned in Q7

8. How is your interaction (in terms of collaboration) with other organic vegetable wholesalers/retailers?

Hint: Wholesalers/retailer union, sharing of knowledge, cost sharing (eg. Purchasing and transporting together)

9. What do you do to ensure that your customers are satisfied?

Hint: Do you buy based on what consumers want? Variety, crop etc.

10. What supporting services do you/ can you explore?

Hint: Financing, etc.

11. What are some of the things that can/should be put in place to make you a more effective wholesaler/ retailer.

Hint: E.g. Financing, transportation services, storage facilities etc.

Is there anything you would like to add or ask?

Interview Guide for Consumers

1. How often do you consume organic tomatoes?

2. Where do you source your organic tomatoes?

Hint: From producer or wholesaler/retailer?

3. Apart from buying, would you like additional services such as delivery?

4. What challenges do you face in sourcing your organic tomatoes?

Hint: Difficulty in finding organic (store), scarcity, distance of source etc.

5. How satisfied are you with the organic tomato that you buy in terms of the variety etc.?

Hint: Use a scale of eg. 1-5

6. Apart from tomato, which other organic vegetable would you like to buy but don't get?

7. How do you get information about organic tomato that you consume and how do you trust the information?

E.g. from labels, from seller etc.

8. What feedback do you give to actors in the value chain?

Hint: Producer, wholesaler/retailer?

9. How do you think that the information you share with them helps them improve their business/ service to you?

E.g. Knowing which crops and variety to grow etc.

10. Apart from verbal feedback, what do you think about platforms that would enable you share information with other value chain actors?

Hint: Suggestion of platforms and benefit.

11. What are some of things that you think can be done to ensure that you are satisfied as a consumer?

Hint: By the producer/ sellers

12. Is there anything you would like to add or ask?