ASSESSING THE SUPPLY CHAIN MANAGEMENT PRACTICES OF AGRI-FOOD COMPANIES TO MINIMIZE WASTE: A CASE STUDY OF BLUE SKIES GHANA LIMITED

By

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DECLARATION

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at Kwame Nkrumah University of Science and Technology, Kumasi or any other educational institution, except where due acknowledgement is made in the thesis.

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ABSTRACT

Supply chain management has become a major part of the management systems of various firms due to the numerous benefits associated with supply chains in today's business environment (Yeboah *et.al*., 2014). The perishable nature and short shelf-life of horticultural products, make the management of the supply chain processes associated with them very important since improper management could easily lead to the wastage of large volumes of fruits and vegetables. The study had three objectives: to identify all the processes involved in the supply and distribution of agri-food products at Blue Skies Ghana Limited, to determine the inefficiencies and problems associated with it and to establish practices that will aid to ensure efficiency and effectiveness in the supply chain management processes at Blue Skies. A purposive sampling technique was adopted for the study which had a population of 35 respondents however only 31 questionnaires were validly completed and retrieved. The tools used for analysis were mean score ranking and relative importance index. The data was then presented in tables and pie charts. The study revealed that the main problems causing bottlenecks in the Blue Skies supply chain were lack of good roads and infrastructure, lack of adequate storage facilities and availability of only small land holdings to farmers. It was also discovered that volume and delivery flexibility as well as return on investment were the key performance indicators that were not being met by the firm. Lastly, it was brought to light that in order for Blue Skies to have a more efficient supply chain they must put measures in place to ensure good customer relationship management as well as review their logistics plan.

Keywords: Agri-food Supply Chain, Key Performance Indicator, Supply Chain Management

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DEDICATION

This work is dedicated to my parents Rev. Dr. Enoch Aryee-Atta and Mrs. Sally Aryee-Atta, and my sisters Margaret Akua Boateng, Joanna Naa Korkoi Aryee-Atta and Julia Naa Adaku Aryee-Atta.

CHAPTER ONE

GENERAL INTRODUCTION

1.1 BACKGROUND OF THE STUDY

A supply chain is defined as a set of three or more entities (i.e. organisations or individuals) that are directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer (Mentzer *et al*., 2001). It also involves the procurement of materials, the transformation of the materials into finished products, and the distribution of those products to end customers (Mentzer *et al*., 2001).

In order to ascertain the degree to which a particular supply chain is successful, an organisation must put measures in place to monitor and examine critically all the activities within the supply chain as well as how well these activities, when brought together seamlessly, may lead to efficient relationship across the supply chain (MANAGE, n.d.). This will enable the organisation to identify and tackle all problems and disconnections within its supply chain and will, in turn, serve as an impetus to the creation of value for consumers, while increasing the profitability of every link in the supply chain and reducing wastage of the resources of the organisation.

The term agri-food supply chains (ASC) has been coined to describe the activities from production to distribution that bring agricultural or horticultural products from farm to fork (Aramyan *et al*., 2006). According to Ahumada & Villalobos (2009), ASCs are formed by the organizations responsible for the production (i.e. farmers), distribution, processing, and marketing of agricultural products to the final consumers.

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The administration of the alliances between all the entities that are involved in the efficient production and supply of products from the farm level to the consumers to meet consumers' requirements reliably in terms of quality, quantity and pricing is referred to by MANAGE (n.d.) as Agri-food Supply Chain Management. In practice, this often includes the management of both horizontal and vertical alliances and the relationships and processes between firms.

Supply Chain Management has been generally recognized as an indispensable component of any organization that seeks to grow as well as fulfil the needs of its esteemed consumers. It is therefore imperative that any organization that wants to attain success should take a critical look at the performance of its supply chain processes since it has the power to boost customer service, reduce costs of operation and improve the financial standing of a company (Negi and Anand, 2015).

The population of Ghana has grown from 24.2 million during the last population census in 2010 to about 30.42 million currently in 2019. This rate of population growth, according to the World Population Review (2019), is said to be unsustainable and the government is currently trying to figure out ways to keep it under control.

This rapid increase in population implies that there will be a rapid increase in demand for food. The proper management of the agri-food supply chain in any agribusiness is very important since it plays a vital role in ensuring that the increasing demand for food of high quality and good nutrition is met (Negi and Anand, 2015).

According to Trading Economics (2019), there has been a decrease in the contribution of agriculture to Ghana's gross domestic product from ₵8723.60 million in the fourth

quarter of 2018 to ₵7845.50 million in the first quarter of 2019. This could be due to a lack of sustainable food production systems in Ghana as well, poor agribusiness management practices (including supply chain management). Based on their econometric models, Trading Economics (2019) has estimated that by 2020, Ghana's GDP from Agriculture is expected to increase to about ₵10635.00 million.

Fruits and Vegetables which are also referred to as protective foods are rich sources of vitamins, minerals, proteins, carbohydrates and other essential nutrients that are needed by the human body. Their perishable nature and short shelf-life, however, makes the management of the supply chain processes associated with them very important since improper management could easily lead to the wastage of large volumes of fruits and vegetables. In addition to cutting down costs, good agri-food supply chain management practices also help to keep up and develop the value of products that are provided to customers (Veena et al., 2011).

As a result of their perishability, fruits and vegetables require diligence during the processes of transportation, handling and storage. If not, by the time they reach the consumer, they will be of very low quality, causing the consumer to either pay less or reject the product since the consumer is not getting value for money, ultimately leading to wastage of resources and a loss to the agribusiness.

A sustainable and efficient agri-food supply chain manages the relationships between all the entities that are in charge of resourcefully producing and supplying fresh agri-food merchandises from farm to fork, in order to ensure that the ultimate customer is satisfied with the final product in relation to quality, quantity, and price (Negi and Anand, 2015).

1.2 STATEMENT OF THE PROBLEM

It has come to the recognition of many researchers and practitioners that the proper management of the supply chain for agricultural food products is very pertinent. They are therefore working on augmenting collaboration within the supply pipeline so as to ensure that the individual members within the supply chain, as well as the entire supply network as a whole are working at their highest level of productivity and efficacy (Van der Vorst, 2000). This may be attributable to how perishable agricultural food products are and the need for quality controlled flows of the products (Aramyan, 2007). Due to the perishable nature of these products as well as their short shelf life, they can deteriorate very quickly as a result of the negligence of players within the supply linkage.

Traditionally, companies in a supply network concentrate on the inputs and outputs of the processes, with little concern for the internal management working of other individual players (Kleab, 2017). According to Aramyan (2007), numerous organizations have come to the realization that in order for them to operate resourcefully and in an effectual manner, it is prerequisite that they ascertain the tools for evaluating their supply chain which best suits the activities of their firm.

It is essential that research pertaining to the fruits and vegetable sector supply chain is conducted so as to find out the issues peculiar to them as well as suggest ways and means by which these issues may be reduced drastically (Negi and Anand, 2015). This review attempts to fill in any loop holes that are related to managing supply linkages in the horticultural sector, specifically in Ghana by using Blue Skies Ghana as a case study.

There are many issues and challenges that affect the entire supply chain of agri-food products due to their perishable nature. In order to outline the likely challenges and put forward mitigating strategies, it is imperative that the supply chain of Ghana's horticultural sector be studied.

1.3 AIM AND OBJECTIVES

1.3.1 Research Aim

The aim of the study is to determine the practices that will minimize waste and ensure sustainability within the supply chain management processes of Blue Skies Ghana Limited.

1.3.2 Research Questions

1. What procedures constitute the supply and distribution of agri-food products in Blue Skies Ghana?

2. What are the supply chain connection points? What inefficiencies and problems are associated with the supply chain?

3. What approaches will aid to ensure sustainability, efficiency and effectiveness in the supply chain of Blue Skies Ghana Limited?

1.3.3 Research Objectives

For the aim stipulated above to be realized, the following specific objectives have been set:

1. To identify the procedures that constitute the supply and distribution of agri-food products in Blue Skies Ghana Limited.

2.   To determine any supply pipeline connection points as well as the inefficiencies and problems associated with it.

3.   Establish practices that will aid in guaranteeing efficiency and effectiveness in managing the supply chain processes at Blue Skies.

1.4 SCOPE OF THE STUDY

The research took place at the Blue Skies Factory and Juice Bar, Ghana which is located in the Eastern Region at Doboro, near Nsawam. This horticultural firm began their production of fresh fruit products in Ghana during the 1990s. They export freshly cut fruits of the highest grade to retailers in Europe and other parts of the world including Sainsbury, Amazon, Tesco, to mention a few. They also provide Ghanaians with freshly-squeezed juice with no additives and dairy-free ice-cream.

This study included looking at how this agri-food company behaves in terms of managing all the processes and players in its supply pipeline as well as its effect on the performance and the challenges it faces. It focused on enhancing the processes involved in the production as well as distribution of horticultural products to minimize waste while ensuring sustainability.

1.5 METHODOLOGY

This refers to the particular processes or modus operandi that a researcher employs to collect and analyse facts and figures concerning a particular situation. This study utilized both qualitative and quantitative methods of data collection. The information needed was collected via questionnaires and an unstructured interview after which analysis was

performed on them to make meaning from the data using the Statistical Package for Social Sciences version 25.

1.6 SIGNIFICANCE OF STUDY

In recent times, managing the supply pipeline has turned out to be a major prioroty of various firms due to the numerous benefits associated with supply chains in today's business environment (Yeboah *et.al*., 2014).

Fruits and Vegetables which are also referred to as protective foods are rich sources of vitamins, minerals, proteins, carbohydrates and other essential nutrients that are needed by the human body. Their perishable nature and short shelf-life, however, makes the management of the supply chain processes associated with them very important since improper management could easily lead to the wastage of large volumes of fruits and vegetables. In addition to cutting down costs, good agri-food supply chain management practices also help to ensure that products that are supplied to customers are always of premium quality via their continuous improvement (Veena *et al*., 2011).

As a result, this research inquiry seeks to enhance the management processes pertaining to the supply linkages at Blue Skies Ghana Limited as well as minimize waste inside the supply pipeline with the purpose of maximizing profit. This investigation also seeks to contribute to the already existing information on how firms that deal in agricultural products manage their supply chains, specifically those into horticultural products (fruits and vegetables) in Ghana, since very limited research has been done in that area.

1.7 LIMITATIONS OF THE STUDY

This investigation extends only towards firms who are in the horticultural/ agri-food industry in Ghana, with a selected firm (i.e. Blue Skies Ghana), as a case study. Further study could consider a wider range of firms including those into vegetable production as well as the cut-flower industry, to improve its validity. Another limitation is the manner in which data was collected i.e the staff members at Blue Skies who were in management positions were given preference over other staff since they were perceived to have a comprehensive knowledge about the undertakings that ensue from the production to the distribution of their products. That notwithstanding, the depth provided by the single case organisation provides much relevance and insight to the discourse on agri-food supply chain management.

1.8 ORGANISATION OF THE STUDY

This paper will consist of five (5) sections which shall conform to the following outline:

The first chapter will give some background information about the study and includes an introduction, problem statement, aim and objectives, significance and scope of the study. The second chapter will review and discuss existing literature on agri-food supply chains. The third chapter will show the methodology that will be used in this research in order to achieve the required objectives. It shall cover the study area, the study population, the sampling procedure, data sources, instrumentation and data analysis, etc. The fourth chapter reports on and discusses the outcomes of the investigation and lastly, the fifth chapter summarizes and concludes the whole investigation while pointing out areas for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews some writings on the subject of supply chain management in general and then zooms in on the supply chain of agricultural food products, its importance, some activities that take place along the chain, some challenges in the agricultural sector and how they can be tackled, to mention a few. In order to answer the research questions of the study, this section reports on the perspectives of other researchers on agri-food supply chain management and how these perspectives can be used to curtail post-harvest losses.

2.2 SUPPLY CHAIN MANAGEMENT

Supply Chain Management, as a modern concept, was derived from Japan's shipyards in the early 1950s, and was afterwards adopted and advanced to enable the mass production of automobiles, specifically by Toyota. One of the lasting consequences of the adoption of the Just-In-Time (JIT) supply management technique was that businesses became more and more conscious of the cost of storing their inputs in warehouses (Hindle, 2008).

Before the introduction of JIT, organisations stored enormous amounts of to be used during the production process. In this day and age, however, it has become more common for the leaders of businesses to manage their supply chains by ordering components in such a way that they only arrive as and when they are required. This can be a difficult feat since many businesses are being tasked with the management of their supplies and production on a global scale (Hindle, 2008).

Products and services procured by numerous companies from suppliers that are outside their organisation have been found to make up about 80% of the revenue of these organisations (CIPS, n.d.). As a result of these intricacies, matters that are related to the management of supply pipelines have become extremely significant to companies, experts, academicians as well as supply chain managers, who have an important part to play in the management of costs. Yeo and Ning (2002) refer to the administration of supply pipelines as the "greatest modern procurement and logistics philosophy' to be accepted by organisations that want to achieve competitive advantage.

Course Hero (2019) describes the supply chain of an organisation as consisting of all of the businesses that are part of all the upstream and downstream movements of information, cash, goods and services, from primary suppliers (i.e. the starting point of the supply chain/ point of origin) to the final consumer (i.e. the end of the supply chain/ the point of consumption).

According to the Chartered Institute of Procurement and Supply, the incessant process of forecasting, developing, regulating, informing and closely observing all the activities within and between all the members in the supply chain to ensure a smooth and unified process which will enable the organisation to realize their company goals. On the other hand, it can be defined as 'the process of strategically managing the movement and storage (if necessary) of materials, parts and finished product from supplies, through the manufacturing process and on to customers or end user, as well as the associated information flows' (Yeo and Ning, 2002).

Supply chain activities encompass everything from the development of the product, to sourcing, manufacturing, and logistics, as well as the structures put in place to ensure that all the needed information is made available on time to synchronize these activities (Kleab, 2017). Below are detailed some of the important processes, according to Kleab (2017), within the supply chain management process:

- Planning- Here, a strategy is proposed to help generate effective supply chain approaches that best fit the organisation in question. The supply chain front-runners of any company that seeks to have competitive advantage must develop supply chain approaches that are cohesive.

- Procurement- At this stage, the process centres on the acquisition of the requisite resources, inputs and merchandises that will be needed for the manufacture of the products produced by the business.

- Production- This is where the raw materials that were procured are transformed, mass-produced, or assembled into finished merchandises or parts for other goods. Supply chain managers provide production support and guarantee that the essential materials are always readily obtainable as and when needed.

- Distribution- Here, the movement of the final products from one point in the supply pipeline to the other is managed. Organisations that provide transportation and logistical services are in charge making sure that the products are moving swiftly and securely in the direction of the point of demand.

- Customer Interface- This is the stage at which, the demand process focuses on all the problems pertaining to forecasting customer interactions, satisfying their requirements, and satisfying orders seamlessly.
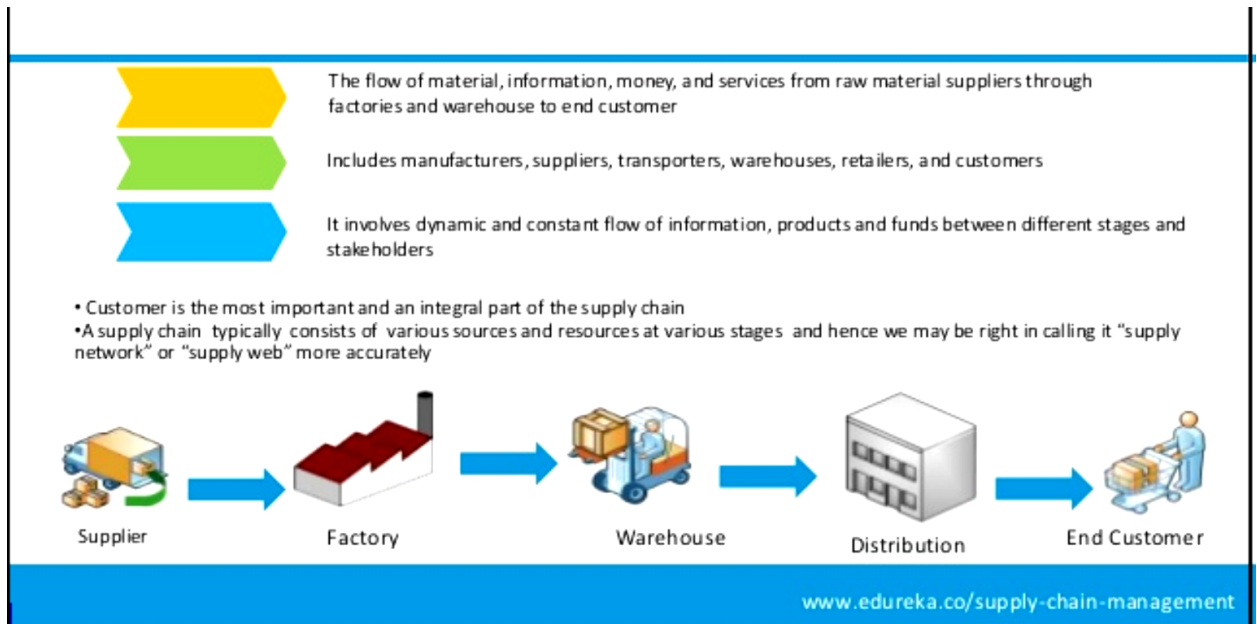
Figure. 2.1:   The Supply Chain Process

 Source: www.edureka.co/supply-chain-management

Supply chain management is a system that is put in place by organisations to synchronize and integrate all of the events that take place within the supply chain as well as the actions executed by the players within the supply chain, into a unified procedure, from the point of supply till the products reaches the end consumer, leading to improved customer value and cost-effectiveness (Shou, 2013). Envisaging the complete supply chain, according to Shukla et.al., (2011), permits managers to take full advantage of strengths and efficiencies at every single point within the process in order to generate an extremely economical, customer-driven supply system.

In the present day, supply chain management plays a twofold part by first, communicating the demand of customers from the point of sale back to the initial supplier, and second, as a physical flow procedure that brings about the judicious and

efficient flow of products all the way through the whole supply pipeline Gitman *et.al.,* 2018).

2.2.1 Benefits of Supply Chain Management

Supply chain management, in current times, has become a fundamental part of commerce and is indispensable to the success of any business, as well as customer satisfaction. A company that manages its supply chain properly has the potential to enhance its customer service, decrease its operating costs and improve the financial standing of the company (Kleab, 2017). Below are listed some benefits of supply chain management:

- It results in lower inventory, transportation, warehousing, and packaging costs;
- It leads to greater flexibility of the supply chain;
- It brings about improved customer service and satisfaction;
- Higher revenues are achieved by the organisation and
- There will be an overall increase in the performance and profitability of the organisation.

2.2.2 Characteristics of an Efficient Supply Chain

The way supply chains are seen in these present times is a direct consequence of extensive investigation into how a supply chains performs, the major problems relating to supply chains, the efficacious administration of threats/ risks, various markets, extensive partnerships as well as changes in technology/ product and service delivery. Nevertheless, some present-day supply chains are still susceptible to issues of ineffectiveness, lack of flexibility, and failure to recognize and meet the increasing and

constantly changing expectations of consumers. An effective supply chain, according to Markim (2015), should consist of the following 7 characteristics:

i)   **Making the Most of Big Data**

The internet has brought about the prevalence of information. As a result of this, data has been demonstrated to be an essential feature of efficient supply pipelines. It enables stakeholders which include individuals who manage the supply pipeline as well as service provides to utilize the information to ascertain inefficiencies within the supply chain, put forward solutions, implement them, as well as create verifiable predictions for requirements in inventory.

ii)   **Inventory Optimization**

When an organisation has an excess, or shortage of a particular item, it is disadvantageous to its supply chain. Inventory optimization is dependent on the accurate estimation of required materials. It also involves an all-encompassing assessment and the prompt identification of unexpected variations in the market, which will have an effect on the manner in which the products are produced and transported, as well as the other areas within the supply pipeline.

iii)   **Supply Chain Flexibility**

Because the world's economy is turning out to be more interrelated with newer, developing markets, the quantity of corporate entities inside the supply chain will upsurge. This brings about the question of how these growing orders will be satisfied at the current rate. The importance of supply pipeline flexibility hinges on this situation. The rate at which a particular supply pipeline is able to acclimatize quickly to the unexpected fluctuations in its intrinsic and extrinsic

environments, which, otherwise, would have had a negative impact on the supply chain.

iv) Rapid Fulfilment

The prevalent growth in interconnectivity, mainly as a result of technology, has given customers the power to claim immediate satisfaction. This has put the onus on businesses to make sure that orders are dealt with impeccably, promptly, and by means of the quickest means of transport. Future supply chains must syndicate various modes of transportation to achieve a competitive advantage.

v) Customization

Tailoring a supply chain process in order to meet the needs or preferences of one's customers is what is being referred to as customization. Furthermore, upsurges in the quantity of players in the supply pipeline will result in a more varied collection of goods to produce and repair. Consequently, supply pipelines for spare parts must be flexible enough to produce custom-made parts to offset this increasing need.

vi) Sustainability

The fossil fuels remaining on earth have become very limited in quantity giving many supply pipelines only one other choice; which is to use renewable forms of energy including solar energy, wind energy, hydropower, geothermal energy, and biomass energy. The type renewable energy slected by a particular supply chain will depend largely on its geographical location. Furthermore, governments are beginning to implement strict requirements for companies and manufacturers to gravitate towards renewable sources of energy.

vii)   Compliance and Visibility

Compliance, which is probably one of the most important characteristics of a productive supply chain, ensures that companies abide by any statutes or regulations by the state or otherwise, which apply to entities involved with the management of supply pipelines. Endwise visibility, on the other hand eradicates all of the possible problems by allowing transparency in the supply chain. In essence, this is a way by which organisations do of self-assessment and monitoring of their supply chain processes, which, in turn, results in greater compliance.

2.2.3 Supply Chain Collaboration

A novel way by which businesses are attempting to achieve competitive advantage is by adopting some form partnership with the other players within the supply chain. (Spekman *et al.,* 1997; Horvath, 2001). In recent times, many companies have recognized that supply chain coordination is a significant approach for outdoing their competition. It has been established that when companies that are within the same supply chain form partnerships, the effectiveness of their value chain is maximized. This means that their products and services will be of high quality, justifying any increases in product prices which will, in turn, translate into returns, while addressing market demand fluctuations. Fisher (1997) observed that, practices that promote coordination activities within a supply chain, including the dissemination of information in a timely manner, serves as an impetus for a symbiotic relationship between actors in the supply chain. When collaborators benefit from each other, according to Walker et al., (2000), it could result in an increase in the return on investments as well as effective inventory administration.

Supply chain collaboration is defined as a relationship amongst several players within the supply pipeline and the modification of business practices in order to guarantee an enhancement in the combined performance of the actors. This involves updating conventional practices, information distribution and the integration of activities such that there is an upsurge in performance by the players within the supply chain (Whipple et al., 2010). It seeks to get the most out of the capabilities and skills that are peculiar to each firm in order to jointly deliver satisfaction to the final customer. The objective of this association is to implement innovative approaches to help meet the needs purchaser (Fawcett et al., 2008). Partnerships between players in a supply chain may come in various forms, however, the common aim is to produce a transparent, visible demand pattern throughout the entire supply sequence.

Mutual trust and honesty amongst the actors in the supply chain are prerequisites for a successful collaboration and cannot be overemphasized. When organisations have confidence in each other, they are more likely to share information on their operations for the benefit of the collaborative team. Members in the supply chain ought to be perceived as an extension of the entity so that, similar consideration will be accorded to all the operations at each stage of the supply chain. (Van der Vost, 2000). As stated by Cachon and Lariviere (2001), the objective of collaborators in the chain, in the long run, is to fulfil the requirements of the customer by delivering products of high value. Nevertheless, in the short term, players in the chain might have incompatible interests which may negatively affect their commitment to collaborate and share real time information. Some businesses do not integrate information acquired from chain members into their activities. McClellan, (2002) defined supply chain collaboration as a win-win

arrangement that has the potential to deliver enhanced commercial success for the players involved. Collaboration requires organisations to work together in order to get mutual benefits. The decision-making entity is vital for assisting the chain members in achieving timely demand and decreasing inventory levels as well as responding quickly and effectively to unexpected variations in demand.

2.2.4 Supply Chain Mapping

The Supply Chain map is a matrix of vertical aligned areas (Supply, Product, Demand), and cross-functional (or horizontal) procedures, for example, product design or demand forecasting. It serves as a referencing instrument when an organisation is in the design phase of supply chain architecture or performing a strategic review (Lepercq, 2007). A supply chain map is a graphical representation of an organisation's supplier network. It is quickly becoming an indispensable instrument for operations, finance, and sustainability due to the fact that it helps businesses to perceive and appreciate their operations in a comprehensive manner. Supply chain mapping is the process of diagramming the movement of products starting from when they are raw materials till, they reach the final consumers. It is built on readily obtainable information on consignments, transactions, and records. Data on supply chain costs, times, and demand helps the organisation to grow with respect to efficacy. Inventory information helps the organisation to visualize the risk exposure of each site. Data on supplier locations allows the organisation to forecast and respond in real time to supply chain disruptions (Tuffour- Mensah *et al.,* 2016). Supply chain mapping plays an important role in helping an organisation to detect blockages in the supply chain by:

- Revealing how processes are carried out;

- Detecting where the processes are executed;

- Ascertaining who is doing what within the processes;

- Providing insight into how processes affect other processes;

- Determining why a process is being executed.

Mapping also makes it easier to detect, remove and/or make adjustments to operations that are not adding value to the process (Tuffour- Mensah *et.al.*, 2016).

2.3 INTRODUCTION TO AGRICULTURE

The term agriculture is derivative of the Latin expressions, *ager,* meaning soil and *cultura,* which denotes cultivation. Basically, it is referred to as the cultivation of soil. It may also be technically defined as the science and art of farming, including the work of cultivating the soil, the production of crops and the rearing of livestock (Borodin *et. al.,* 2016). It is the most comprehensive term used to represent the numerous means through which crop plants and domestic animals sustain the global human populace by providing food, feed, bio-energy and industrial material products.

It comprises a very varied continuum of activities that include but are not limited to cultivation, domestication, horticulture, arboriculture, as well as forms of livestock management, like mixed crop-livestock farming, pastoralism, and transhumance (Harris & Fuller, 2014). In Merriam-Webster's dictionary (1999), agriculture is defined as the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products.

2.4 THE AGRI-FOOD SUPPLY CHAIN

Bijman (2002), defined an agricultural supply chain as a supply chain within which agrarian products are taken through various phases of production and distribution before getting to the end-consumer. Agricultural supply chains consist of a number of processes, including production, storage, processing, and finally, the distribution of the end-product to the final consumer. For it to be coordinated efficiently, the agri-food supply chain necessitates the management of activities from the strategical level to the operational level. It is therefore expected that one of the most popular topics that are deliberated upon, when it comes to agricultural supply chains, should target planning problems (Borodin *et al.,* 2016). Agriculture is characteristically a fragmented industry, which is made up of a variety of distinctive enterprises (farmers, processors, marketers and distributors), and is dependent on raw materials from many different sources, often at distinctive geographical positions (Opara, 2003).
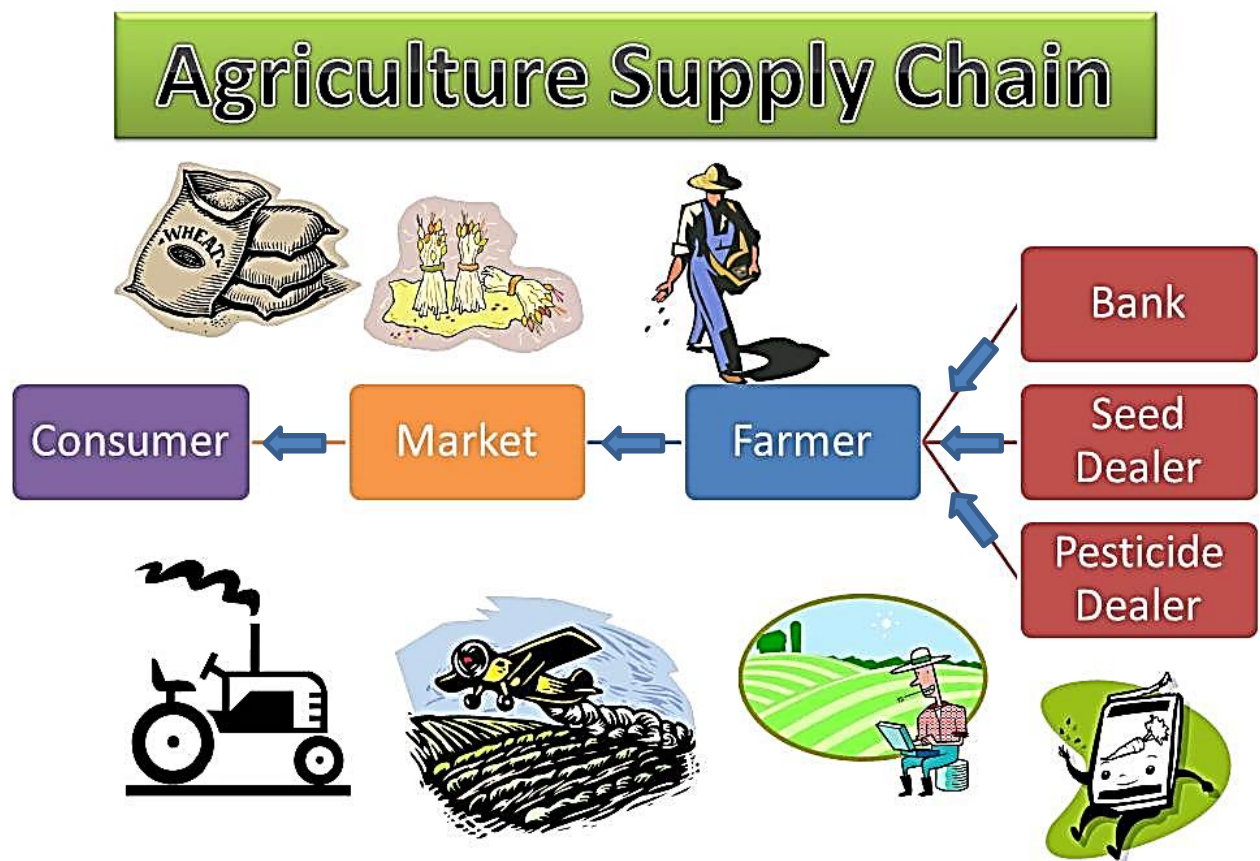
Figure. 2.2:   A Typical Agricultural Supply Chain

Source: http://aggossip.blogspot.com/2013/01/need-to-develop-farm-supply-chain.html

According to Viaene and Verbeke, (1998), regarding grains and fresh fruit and vegetables, most marketers and processors procure their supply from various sources (farmers, retailers, brokers) with the intention of meeting marketing and production goals. From the marketing and processing viewpoints, supply chain management is an indispensable instrument for synchronizing the activities of the different suppliers within the operations of the organisation, so as to guarantee the reliable delivery of products with quality assurance and services to the customer. In relation to the customer and other shareholders, supply chain management places emphasis on ensuring that supply chain

performance is improving through the delivery of guaranteed safe, desirable and good quality food in a cost-effective manner.

2.4.1 Characteristics of the Agri-food Supply Chain

Some factors that make agri-food supply chains unique, when compared to other supply chains, according to many authors like Van der Vorst (2000); Van der Spiegel (2004), etc., include:

- High risk and variability due to the fact that the production of agricultural products is to a certain extent based on biological processes, seasonality, climatic conditions, pests and diseases, to mention a few.

- The behaviours of consumers and the public with respect to questions concerning matters including food safety, animal welfare and environmental pressure;

- The raw materials, intermediates and finished products in the agricultural supply chain have very short shelf life thus the products deteriorate as they move along the supply chain;

- The products are bulky to transport;

- Long production throughput time i.e. the amount of time it takes to convert raw materials into finished products;

- Seasonal supply of products requires global sourcing;

- Agricultural products require conditioned transport and storage;

- Statutes by the government pertaining to environmental and consumer related issues (e.g. CO_2 emissions, food safety issues);

- Physical features of the product (e.g. taste, smell, appearance, colour, size and image);

- Additional features (e.g. convenience of ready-to-eat meal);

- Matters pertaining to the safety of the product (e.g. increased customer interest with respect to both the product and the manner in which it was produced. There is zero tolerance for risks when it comes to food consumers;

- What consumers think about a particular product in terms of quality is very important for food chains that is why branding and advertisement play significant roles in influencing the quality perception of consumers.

2.4.2 Agri-food Supply Chain Management and Logistics

The online Business Dictionary defines logistics as planning, execution, and control of the procurement, movement, and stationing of personnel, material, and other resources to achieve the objectives of a campaign, plan, project, or strategy. It may be defined as the management of inventory in motion and at rest. Agricultural products logistics, denotes the physical movements of products and their associated data from the manufacturer to the customer. It includes agricultural production, procurement, transportation, storage, loading and unloading, handling, packaging, processing, distribution, and information activities. Development objectives of agricultural products logistics include: to increase the value-added to agricultural products, to save distribution costs, to improve circulation efficiency while reducing unnecessary losses, and, to avoid market risks (Wang, 2012). The objective is to enhance the passages through which agricultural products are disseminated, decrease operating costs of agriculture-related enterprises, and make

available faster and improved services to customers of agricultural products (Gebresenbet and Boso, 2012).

Effective logistics and technologies are essential for driving the success of an organisation. Effective logistics requires delivering the right product, in the right quantity, in the right condition, to the right place, at the right time, for the right cost and it has a positive impact on the success of the partners in the supply chain (Gebresenbet and Boso, 2012). Nevertheless, up till now, the link between the logistics systems of the players in the agri-food supply chains is somewhat loose and disjointed. The efficient use of vehicles could be amongst the approaches to decrease transport work and lessen negative environmental impact (Gebresenbet and Ljungberg, 2001).

Smallholder agriculture, in developing countries, is very sensitive to transport strategies. Several of these farmers have little chance of being emancipated from poverty since their marketing activities are easily hindered by inadequate transport amenities. A well-planned transport system will facilitate the transition of smallholder farmers from subsistence farming to small-scale commercial farming because it increases mobility and encourages production, it allows them to harvest and market their produce with efficacy, it decreases drudgery and assists in the stimulation of social integration while improving the standard of living of the farmers (Gebresenbet and Oodally, 2005).

Members in the agricultural supply chain, (farmers, traders, processors, retailers, etc.), need to recognize that products may be subject to deterioration due to improper handling at any point in time by one of the players in the chain. It is also very critical that organisations ensure that their suppliers provide goods with the right volume, right

quantity, and right quality, at the right place and at the right time. Additionally, they need to synchronize the timing of the supply of goods with suppliers in order to match capacity availability.

2.4.3 Efficient Consumer Response in Agri-food Supply Chains

Barron's Dictionary defines Efficient Consumer Response (ECR) as a system for replenishing merchandise based on actual customer demand. Previous approaches of inventory replenishment were based on orders and depended on retailers and wholesalers to forecast demand. ECR, on the other hand, is demand driven. The demand serves as an impetus for the production and freight of produce based on consumer purchase activity. ECR decreases the total cycle interval from purchase to replenishment, decreases the cost of storing extra stock, and assists retailers, wholesalers, and manufacturers in ascertaining the best possible product combination.

ECR envisages the effect product promotion has on retail demand and production requirements. It is reliant on the efficient and timely distribution of information throughout the supply chain, starting with the data on sales collected at a point-of-sale. Salmon (1993) describes ECR as a grocery-industry strategy in which distributors and suppliers are working closely together to bring better value to the grocery consumer. It is the implementation of a simple, fast and customer-driven system, which makes use of all the links of the supply chain to ensure that customer requirements are fulfilled at the lowest possible cost (ECR Europe Executive Board, 2003).

Formerly, suppliers, retailers, wholesalers as well as manufacturers focused on their own individual business activities instead of operating with a mutual objective for their

marketing and logistics operations. This resulted in low efficiencies and profitability (Reyes and Bhutta, 2005). ECR provides an all-inclusive vision for the marketing/logistic operations in a supply chain and seeks to produce a system that facilitates unified approach to the marketing and logistics operations of the organisation (Svensson, 2002; Dornier *et al*. 1998).

ECR strategies are focused on cutting down costs from the supply chain through partnerships between food processors, distributors and grocers. Essentially, the emphasis has been placed on the application of information management technology to enhance the transfer of goods from the producer to the customer (Tikhonov, 2010).

Four important approaches, according to Salmon, (1993) that can be used to attain maximum efficiency while cutting cost:

1)   Efficient Store Assortment

2)   Efficient Replenishment

3)   Efficient Promotion

4)   Efficient Product Introduction.

2.4.4 Challenges in Agri-food Supply Chain Management

Some characteristic problems that may serve as a hindrance to the efficacious development and administration of supply chains, according to Boehlje *et al.,* (1999) include:

- The presence of a mismatch in the individual organisational objectives of the players within the supply chain;

- The absence of mutual confidence and reliance between the chain members;

- When actors within the supply chain do not comprehend the operations of the other members involved in the chain;

- Failure by the chain members to indulge in regular correspondence;

- Reluctance of players in the supply chain to devote their resources to the development of the chain;

- Impartial allocation of risks and rewards;

- Lack of an adequate system of governance with unbiased distribution of power and control;

- Absence of enabling environment and national policies for the establishment of efficient supply chains;

- Incapacity of organisations to execute supply chain management concepts, as a result of poor organizational structure, poor governance and poor synchronization of the associations in the supply chain;

- Technological change.

2.5 SUPPLY CHAIN PERFORMANCE MEASUREMENT (SCPM)

Performance is subjective (Lebas, 1995) and reliant on the aims and objectives that are peculiar to every organisation. It refers to the capability of an entity to meet established benchmarks, the time interval, as well as the pathway involved (Gamme and Johansson, 2015). Knowledge about the performance of a supply chain is essential since it aids in the assessment of the efficacy of organisational activities, as well as ascertaining any prevailing problems, so as to enhance operations (Ouyang, 2012). Bhagwat and Sharma, (2007) draw attention to the fact that performance measurement allows organisations to identify bottlenecks within the supply chain and develop ways to alleviate the identified

challenges. Inadequate performance measurement is a remora to productive supply chain management (Lai *et al.,* 2002) since it has a direct impact on the behaviour that influences supply chain performance (Agami *et al.*, 2012).

Abu-Suleiman *et al.,* (2004) made assertions that performance measurement systems are crucial to the success of an organisation's supply chain because of the following reasons:

a. It drives organizational actions

b. It serves as a framework for making strategic decisions

c. It provides necessary feedback information about operations.

Many authors including Turnock and Thompson, n.d.; Kurien and Qureshi, 2011; Akyuz, and Erkan, 2010; outline some crucial characteristics of an effective performance measure to include measurability, consistency, universality, inclusivity, validity, reliability, functionality, credibility, etc.

Fundamentally, SCPM allows an organisation to evaluate the improvement, or otherwise, of their supply chain. Regardless of the fact that supply chain management has gained popularity among many organisations as a critical ingredient for business success, they are often deficient in their capacity to develop effective performance measures and metrics that are tailored to their needs (Gamme & Johansson, 2015). Until recently, several businesses depended on financial accounting metrics to assess their supply chain performance. Lately, however, many of them are shifting to the mixed approach, which includes both financial and non-financial performance indicators, due to uncertainty and variation in the business environment (Kurien and Qureshi, 2011).

Kurien and Qureshi, 2011 and Lapide, 2000, consent to the fact that financial measures are essential in the measurement of the financial performance of an organisation. They however believe that when it comes to measuring supply chain performance, relying solely on them is inadequate for the following reasons:

1. They tend to be short-term, internally focused and historically oriented;
2. They do not cater to essential, strategic, non-financial performance indicators like customer satisfaction and product quality;
3. They do not directly tie to operational effectiveness and efficiency.

In addition to the financial measures, which are characteristic of quantifiable measures, there are similarly qualitative measures which cannot be directly represented numerically. Examples include customer satisfaction and information flow (Beamon, 1999). Likert scales, which are based on a number of options rating an opinion or feeling to a degree of compliance with a statement (Tonchia & Quagini, 2010) are one of the most common ways of representing qualitative information.

2.5.1   Key Performance Indicators

One thing that is unchanging about business environments is the fact that they do not cease to change. This means that organisations need to put measures in place to allow them to adjust quickly and in an agile manner to unexpected variations that present themselves. It has been established that performance measurement is a key impetus for business success. One technique for observing and quantifying the well-being of an organisation is through Key Performance Indicators (KPIs). KPIs are financial and non-financial measures of the outcomes of business operations that illustrate the performance of activities within the business (Folnovic, n.d.). When it comes to performance

measurement, organisations must begin by defining and developing KPIs that will be necessary for their growth. Some KPI categories that are peculiar to agribusinesses include:

- Productivity e.g. estimated production potential, fertilizers per output, chemicals per output, yield per acre, etc.
- Finance e.g. current ratio, working capital, return on equity, operating profit, etc.
- Administrative e.g. planation age structure, total plant number, field utilization rates, people efficiency, mechanization utilization, etc.
- Inventory e.g. monthly stock usage, waste percentage, average usage period for various inputs, etc.

Results ascertained from KPIs must be placed alongside the goals and objectives of the organisation, which will serve as a benchmark for measuring performance. The KPIs selected by the organisation need to be relevant to the business in that they should provide meaningful and timely information concerning the financial performance of the organisation as well as the implementation of selected approaches. Using KPIs prevents companies from adopting a reactive approach when it comes to dealing with emerging risks and opportunities. It also guarantees the efficient execution of organisation's business plan. According to Folnovic, n.d, some of the most beneficial effects of KPIs on agricultural efficiency are:

1. It results in an upsurge in profit and productivity;
2. It ensures judicious use of time;
3. It enables management to make more knowledgeable business decisions.

2.6 PERFORMANCE MEASUREMENT SYSTEM MODELS

Table 2.1: Differences between Traditional and Non-Traditional Measurement Systems

TRADITIONAL MEASURES	NON- TRADITIONAL MEASURES
Based on out-dated traditional accounting system	Based on company strategy
Mainly financial measures	Mainly non-financial measures
Intended for top and senior managers	Intended for all employees
Late metrics (weekly or monthly)	On-time metrics (hourly, or daily)
Difficult, confusing and misleading	Simple, accurate and easy to use
Lead to employee frustration	Lead to employee satisfaction
Neglected at the shop floor	Frequently used at the shop floor
Have a fixed format	Have no fixed format (depends on needs)
Do not vary between locations	Vary between locations
Do not change over time	Change over time as the need changes
Intended mainly for monitoring performance	Intended to improve performance
Not applicable for JIT, TQM, RPR, OPT, etc.	Applicable for JIT, TQM, RPR, OPT, etc.
Hinders continuous improvement	Support continuous improvement

Source: (Ghalayini and Noble, 1996)

A good supply-chain performance measurement system must echo the goals of all stakeholders (i.e. customers, owners, personnel, etc.), include a mix of both quantitative and qualitative feedback and harmonize operational goals with critical success factors and objectives (Korpela *et al.,* 2002). They go on to propose some categories of performance indicators which include, but are not limited to, customer satisfaction, flexibility and efficiency, and also suggest that within these categories, indicators like quality, time and costs must be taken note of. There are several techniques available that incorporate various performance indicators into a single measurement system. The popular ones, each of which will be elaborated on, include:

- The Supply-Chain Operations Reference (SCOR) model

- The Balanced Scorecard

- Multi-Criteria Analysis

- Data-Envelopment Analysis

- Life-Cycle Analysis

- Activity-Based Costing

2.6.1 The Supply-Chain Operations Reference (SCOR) model

The Supply Chain Council, (2004) describes the supply chain operations reference model (SCOR) as a performance management system that tackles, improves, and communicates supply chain management decisions within a company and with suppliers and customers of a company. It defines the organisational operations that are requisite for meeting the needs of the consumer while also assisting in explaining the activities that take place at the various stages within the supply pipeline so as to develop ways to make the whole process as efficient as possible. Huan *et. al.,* (2004) have labelled the SCOR model as having the most potential when it comes to performance measurement systems. It incorporates corporate concepts like process re-engineering, benchmarking, and measurement into its framework which places emphasis on five key parts of the supply chain. These key areas (i.e. planning, sourcing, making, delivering, and returning) are represented in Fig. 2.3 below:
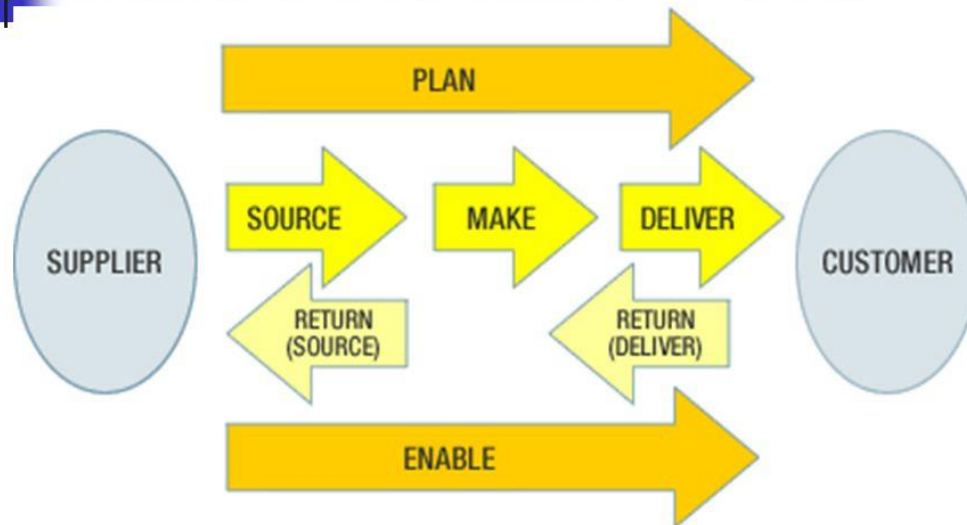
Figure. 2.3:   SCOR Management Processes

Source: https://slideplayer.com/slide/5889380/

2.6.1.1 Strengths and Weaknesses of the SCOR Model

Below are listed some strengths and weaknesses of the SCOR model, as outlined by Ainia, (1996):

2.6.1.1.1 Strengths

➢ Well-thought-out approach for the alignment of strategic and operational metrics and goals to ascertain new prospects of development within the organisation.

➢ It serves as a standardized supply chain process reference model and framework.

➢ It serves as a standardized multi-level process performance metrics.

> ➢ It serves as a source of information with respect to industry and competitive standards.

> ➢ It is a macro-level method for recognizing prospects of development.

> ➢ Determines enabling IT capabilities that will enhance the supply pipeline

2.6.1.1.2 Weaknesses

> ➢ Insufficient training and development activities throughout the entity.

> ➢ Limited analytical tools for cause-and-effect analysis and problem solving at the macro-level.

> ➢ Lack of adequate tools, approaches and systems to aid in the implementation of projects recognized by the SCOR efforts.

> ➢ Absence of programmatic infrastructure for the organization and management of concurrent project activities.

2.6.2   The Balanced Scorecard

The Balanced Scorecard (BSC) method, which was created by Kaplan and Norton, (1992), makes use of both financial and non-financial performance indicators. It ensures that only very essential information is gathered, by restricting the quantity of measures used. The balanced scorecard forces managers to place most of their attention and resources on the few most crucial performance measures (Kaplan and Norton, 1992). It enables leaders to perceive the organisation from four essential viewpoints (see Fig. 2.4) by giving responses to the following questions:

•   How do we look to shareholders?

•   What must we do to excel?

- Can we continue to improve and create value?

- How do customers see us?

The Balanced Scorecard Links Performance Measures
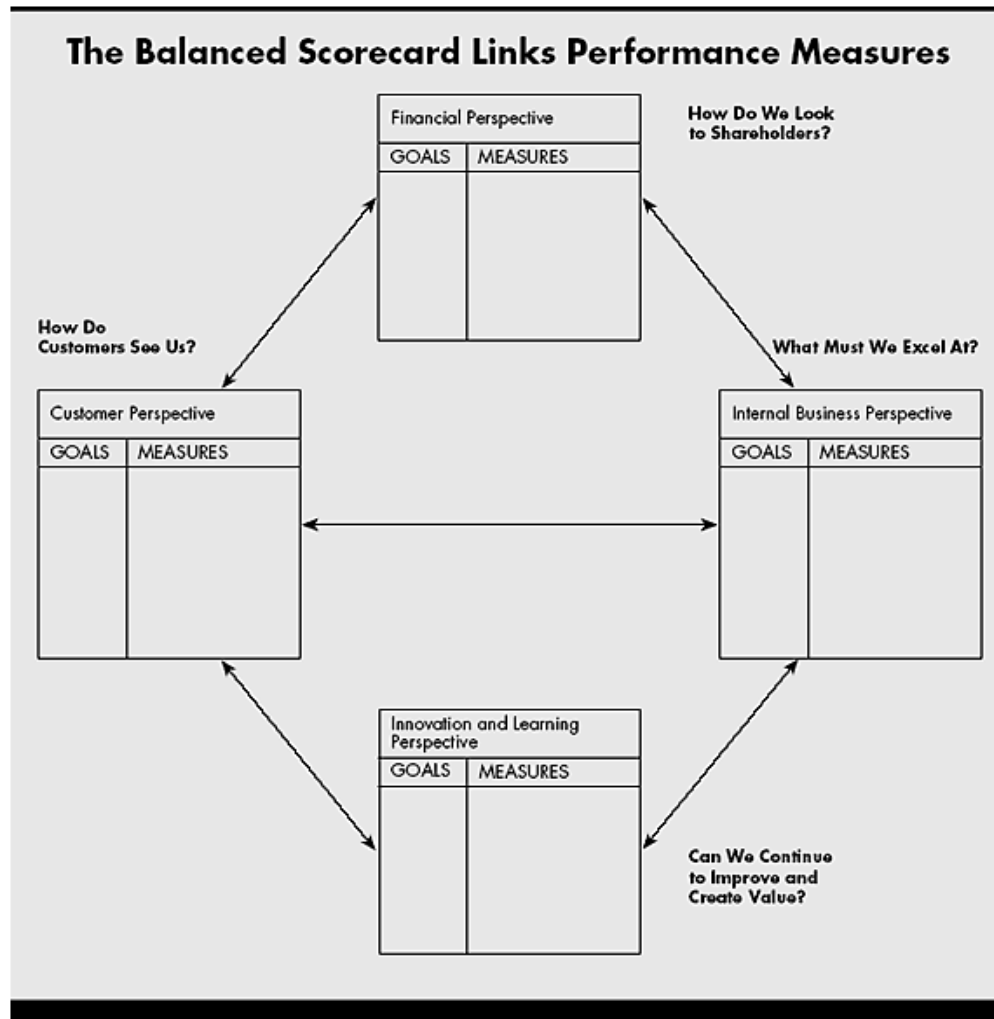
Figure. 2.4:   Performance Measures in the Balance Scorecard

Source: https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2

2.6.2.1 Strengths and Limitations of the BSC model

2.6.2.1.1 Strengths

➢ It integrates, in a single management report, many seemingly distinct components of an organization's competitive agenda e.g. becoming

customer oriented, shortening response time, improving quality, emphasizing teamwork, reducing new product launch times, and managing for the long term.

➢ It safeguards the company against sub-optimization. By compelling managers to take careful note of all the essential operational measures together, the balanced scorecard allows them to recognize correlations between different measures. For example, it could help to ascertain whether an enhancement in one area may affect the achievement of another measure either negatively or positively.

2.6.2.1.2 Limitations of BSC

➢ It requires significant time and financial cost investment.

➢ If stakeholders do not understand or buy into the BSC system, using it will be highly ineffective.

➢ There is the potential for the organization to divert from its general strategic direction if too much emphasis is placed on metrics.

➢ There is the risk of working on areas that don't need improvement and ignoring areas that do if data collection and analysis is not done diligently.

➢ Lack of external focus which could lead to the entity focusing too much on performing well internally, while ignoring external factors that could also affect the operations of the organization.

2.6.3 Multi-Criteria Analysis (MCA)

Multi-criteria analysis is a performance measurement model that enables the leaders within an organisation to make informed decisions concerning operational activities

(Dodgson et. al., 2009) by using the organisation's objectives as a benchmark to select key performance indicators which will be used to ascertain whether or not the organisational goals are being met. It focuses on the decisions made by the managers in establishing goals and benchmarks, estimating relative importance weights and comparing the impact of each option to each performance benchmark.

The main weaknesses of MCA emerge (APFM, 2013) when a particular option would be better when it is paralleled with one criterion but worse against another in the matrix. Weighting or ranking becomes essential to cater for such occurrences however; they also have their own related procedural difficulties. Multi-criteria analysis is also deficient when it comes to making inter-temporal contrasts. This is because effects that occur during the project development phase are not differentiated from those that occur during the operational phase. It has no analytical technique like discounting to compare impacts (benefits and costs) occurring in different years (APFM, 2013).

2.6.4 Data Envelopment Analysis (DEA)

Data Envelopment Analysis is a system used for analysing the performances of various units of a business that are comparable so as to ascertain the unproductive operations or units in the business. Many researchers have described it as the forerunner of non-parametric methods. It is built on linear algebra and is associated with linear programming concepts. It is also comparable to mathematical duality relations in linear programming. DEA evaluates operational activities by using output and input ratios to measure productivity. Productivity can be ascertained either by using partial productivity measures or total factor productivity measures. As suggested by their names, the former

fails to cater to all output and input factors of the organisation, while the latter does (Data Envelopment Analysis Lecture, n.d.).

2.6.4.1 Advantages and Disadvantages of DEA

2.6.4.1.1 Advantages

- ➢ It is the best model for tackling intricate relationships between multiple inputs and outputs.
- ➢ Contrast assessment as well as Evolution evaluation.
- ➢ It identifies and keeps track of activities within the supply chain that are not profitable.
- ➢ It is perfect when handling several elements.
- ➢ It does not require high calculating power.
- ➢ Input and outputs units do not need to be equivalent.

2.6.4.1.2 Disadvantages

- ➢ The data needed for this supply chain technique is usually unavailable and untrustworthy.
- ➢ Absence of hints could result in the omission of a particular component from the model.
- ➢ Results may be unreliable since the ratio of components to the inputs and outputs is quite low.
- ➢ It is a model that will always produce the same output information when given the same input. It does not consider statistical errors (Farantos, 2016).

2.6.5 Life-Cycle Analysis (LCA)

Fundamentally, the Life Cycle Analysis model assists decision makers/ stakeholders, in making informed decisions concerning operations which will decrease negative effects on the environment while realizing other objectives.

Life-Cycle Analysis considers how the selection of particular products or procedures affect the supply pipeline as well as the procedures and products that could have resulted in that particular selection and the instantaneous impacts of these choices. This perspective reveals that 'industrial ecosystems', can be likened to natural ecosystems in that they are massive complexes of interrelated operations. In such systems, the magnitude of a particular variation may not reveal the extent of its effect and as such, decision makers must be cautious to prevent variations that capitalize on local benefits while neglecting the global effects (Vigon *et al*., 1993).

2.6.5.1 Advantages and Disadvantages

2.6.5.1.1 Advantages

➢ It accounts for the production or consumption of resources such as energy or carbon emissions, irrespective of where the process might be located or if it changed from one form to another.

➢ It offers a comprehensive representation of the product, process or service e.g. while a seemingly minor variation may appear to bring environmental benefits, it may actually produce more carbon emissions downstream, thereby negating its overall advantage.

➢ A cradle-to-grace allows the producer to assess any changes in the production timeline.

2.6.5.1.2 Disadvantages

> ➢ They are very specific. This makes it difficult for them to be transposed across to similar operations.

> ➢ Acquiring inventory data can be challenging and best estimates need to be used.

> ➢ Amalgamating data can be expensive and time consuming.

> ➢ It does not necessarily identify which product or process is the most efficient in terms of cost, time and operations consequently, it should be used as a component of a more comprehensive study.

2.6.6 Activity-Based Costing (ABC)

This performance measurement system is characterized by a two-staged process. Stage one involves identifying important operations and allocating overhead costs to every operation, taking into consideration the fraction of the organisation's resources which will be used. The overhead costs that are allocated to each operation make up an activity cost pool (Babad and Balachand, 1993). Cost drivers that are suitable for each cost pool are then ascertained. At the second stage, the overhead costs are allocated from each activity cost pool to each product line in proportion to the amount of the cost driver consumed by the product line. An organisation may form an entity called the activity accountancy to estimate earnings and expenditures for every single operation (Karlöf, 1993). They are also in charge of managing and controlling the scheduled operations.

2.6.6.1 Advantages and Disadvantages (Reyhanoglu, 2011)

2.6.6.1.1 Advantages

➢ ABC makes available a more accurate cost per unit measurement, leading to enhanced performance management, sales strategy, pricing, and decision making.

➢ It gives managers understanding about the drivers of overhead expenses.

➢ It takes into consideration the fact that overhead costs are not always related to production and sales volume.

➢ May be used to obtain accurate costs in a complex business environment.

➢ ABC goes beyond production overheads. It is functions well when used for all overhead costs.

➢ It works effortlessly with both service costing and product costing.

2.6.6.1.2 Disadvantages

➢ ABC becomes less advantageous if the overhead costs are primarily volume related or if the overhead cost is small when compared with the overall cost.

➢ Assigning all overhead costs to particular operations may not be likely.

➢ Selected activities and their corresponding cost drivers may be unsuitable.

➢ Difficult to expound to the shareholders of the costing exercise.

➢ The benefits gotten from ABC may not be enough to justify the expenses involved.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 INTRODUCTION

This section gives a brief profile of Blue Skies Ghana Limited and goes on to outline the processes employed in order to acquire relevant information in an attempt to realize the aim and objectives of the study. It encompasses the research design, the population of the study, how data was collected and analysed, as well as ethical considerations.

3.2 BLUE SKIES GHANA LIMITED

Blue Skies Ghana Limited is a multi-award-winning horticultural firm that deals in the production of tropical fruits including pineapples, pawpaw, passion fruit, mangoes, etc. These fruits are produced by contracted farmers who supply their produce to the fruit factory at Doboro in the Eastern Region, near Nsawam. The fruits are then processed into freshly squeezed juices, dairy-free ice-cream or fresh cut fruits which are then exported to supermarkets and retailers worldwide. One of the core values at Blue Skies is to 'Add Value at Source'. This implies that the firm has put measures in place to ensure that all their final products are produced in the area within which the inputs (fruits) were procured. This goes a long way to ensure that most of the value gotten from the finished product is returned to the communities within which the fruits were produced. The Blue Skies mission is to build together a profitable enterprise where people respect each other, care for the environment and inspire a legacy for the future.

3.3 RESEARCH DESIGN

A research design is the general plan for connecting the conceptual research problems to the pertinent (and achievable) empirical research (van Wyk, 2010). According to Dyslex (2011), it is grounded on the research questions and can be described as a blueprint for the collection and analysis of the evidence pertaining to the particular problem in question. A research design may be exploratory, descriptive, explanatory, predictive, etc. This study is mainly descriptive and employs the case study approach. This implies that it attempts to present a precise illustration of the elements that are relevant to the research questions (van Wyk, 2010).

The case study approach, Saunders, (2007), provides responses to questions like why, what and how. Robson, (2002), explains it as 'an approach for investigation which consists of the empirical study of an existing phenomenon within its real life setting, using various sources of information'. Case-studies evaluate people, events, decisions, periods, projects, policies, institutions, etc. by trying to define relationships which occur in actuality.

A research may either employ the quantitative or qualitative methods or both. Quantitative approaches highlight objective measurements and the statistical, mathematical, or numerical analysis of information gathered through polls, questionnaires, and surveys, or by manipulating pre-existing statistical information by means of computational modus operandi (Babbie, 2010). According to Muijs, (2010), it lays emphasis on the collection and analysis of numerical data in order to quantify attitudes, opinions, behaviours, and other defined variables so as to generalize results from a sample to the population of interest or explain a particular occurrence.

Quantitative research uses measurable data to formulate facts and discover patterns in the study (DeFranzo, 2011).

Qualitative approaches, on the other hand are mainly exploratory approaches and produce non-numerical data. They are used to gain an understanding of the fundamental whys and wherefores, opinions, and motivations of people's actions in order to provide insight into the issue at hand. They also help in the development of concepts, theories and assumptions for possible quantitative research. Qualitative methods typically employ structured, semi-structured or unstructured techniques of collecting primary data. Some common methods include focus group dialogues, individual interviews, and observations. The sample size is characteristically small, and respondents are selected to fulfil a given quota (DeFranzo, 2011).

This study uses both the qualitative and quantitative research methods. Data was collected primarily by the administration of e-questionnaires to staff members in management positions at Blue Skies as well as an unstructured interview with the Site Technical Manager. Literature from other secondary sources like books, journals and the internet was also used. Data collected was analysed using basically descriptive statistics and conclusions and recommendations were made based on the findings.

3.4 POPULATION OF STUDY

The population refers to a well-defined group of people or objects identified to possess similar physiognomies. Typically, the description of the population and the common distinguishing factor of its members are similar. In this study, the population comprises

all workers who directly or indirectly affect the performance of the supply chain at Blue skies.

3.4.1 Sample Size

The sample size is the number of individuals on which the experiment or investigation is actually performed. Lavrakas, (2008) defines it as the amount of units that were selected, from which data was collected. According to Wikipedia, it is used to make generalisations about a population. It is typically determined by the cost, time, or convenience of collecting the data, and the need for it to offer sufficient statistical power. Various reasons compelled the researchers to study a sample rather than an entire population. Basically, it was impractical to survey the entire population due to difficulty in accessing all employees at Blue Skies Ghana considering their tight work schedule; inability to reach their suppliers due to their location as well as limited access to their customers, most of whom are outside the country. Again, the time required to complete this particular study did not permit full coverage. The sample size of this study was 35 individuals who were made up of made up the staff members in management positions at Blue Skies.

3.4.2 Sampling techniques

Purposive sampling, which is also referred to as Judgement or Selective sampling, was the technique used to choose individuals who would participate in the study. The selection of the people allowed to participate in the study is based on the discretion of the researcher. It is based on the intention or the purpose of the study (Singh, 2018). This means that only individuals from the population that best suit the purpose of the study

will be chosen. Purposive sampling is time and cost effective to carry out (Ben-Shlomo et al., 2013).

Judgemental sampling is a non-probability sampling technique. According to Lund Research Ltd (2012), the sample being investigated will be characteristically small when likened to probability sampling methods. This sampling method obliges the investigator to have previous information about the purpose of their research in order to correctly select appropriate respondents. Researchers employ purposive sampling to enable them have access to a specific group of individuals, as all respondents partaking in the research are chosen since they fit a certain profile that is determined by the researcher (Foley, 2018).

The principal reason for purposive sampling is to concentrate on specific physiognomies of a population that are being studied, which will best enable the researcher to answer their research questions and meet the objectives of the study. Even though in using the selective sampling technique, the sample that is chosen is not representative of the population, for investigators employing qualitative or mixed method research designs, this is not considered to be a weakness (Lund Research Limited, 2012).

3.5 DATA COLLECTION

Data collection instruments are tools that make it possible to collect data that is relevant to the research topic. The data on the field was collated using the quantitative and qualitative approach which constitutes questionnaires administration, structured interviews and semi-structured interviews. A questionnaire is a set of written questions with spaces provided for respondents to reply to the questions. Questionnaires are

frequently self-administered or may be used during an interview. Interviews, on the other hand, may be structured (i.e. the same questions are administered in the same order to the respondents who are given a limited number of answers to select from), semi-structured (i.e. the interviewer has a primary set of questions he asks in each interview but is allowed to change the order in which the questions are asked and ask further questions where necessary. Interviewees are permitted to answer questions in their preferred way.) and unstructured (i.e. the interviewers have a set of topics they want interviewees to share their opinions on. Questions asked are phrased according to the preference of the interviewers and interviewees are also allowed to answer in whatever way they wish.) A set of questions which were based on the research questions was administered to respondents by electronic means using Google forms.

3.5.1 Primary and Secondary Information

Primary data was compiled from a chosen group of respondents within the sampling frame. The study analysis was substantially made with this data as the basis. The researcher also referred to The researcher also referred to various publications of foreign and local origin, books, journals, articles, newspapers and reports obtained from the internet for secondary data on the subject to obtain additional information in order to answer the research questions.

3.5.2 Questionnaire design

The questionnaire was designed by the researcher from existing literature and was reviewed by her supervisor as well as other experts in academia and supply chain management. The questionnaire and interview questions were subsequently pilot tested to enable the researcher to pinpoint and remove likely vagueness in the questions. The

questions were gathered in groups to collect data concerning the supply chain management processes from the staff of the selected firm, the loopholes in the supply pipeline of the firm in addition to ways to make the supply chain more efficient.

3.5.3 Questionnaire Administration

The preliminary questionnaires as well as the interview guide were pilot tested to be sure that all questions were straightforward and unambiguous, so that all answers given will be in line with the purpose of the study. This was done develop the consistency and legitimacy of the study. The questionnaires were self-administered using electronic means while the unstructured interview was done on a face- to basis.

3.6 DATA ANALYSIS

This study employed both qualitative and quantitative research approaches but is largely descriptive in nature. A descriptive research presents facts concerning the nature and status of a situation, as it exists at the time of the study and also describes present conditions, events or systems based on the impressions or reactions of the respondents of the research (Bryman and Bell, 2007). The major tool used in collecting data in this research was questionnaires and interviews.

The investigation utilized the quantitative and qualitative approaches to analyse the collected data. Microsoft Excel was used for data entry whilst the Statistical Package for Social Sciences (SPSS) version 25 was used to analyse the data. Data collected was collated and analysed using various quantitative statistical models such as tables, bar charts and pie charts to illustrate the results obtained from the study.

3.7 ETHICAL CONSIDERATIONS

According to Saunders et al., (n.d.) ethics refers to the aptness of one's conduct relative to the rights of those who become the focus of one's work, or are inclined by it. Cooper and Schindler (2008) describe ethics as the 'customs of behaviour control of descent or proper choices concerning our manner and our associations with others. Research ethics thus refers to queries regarding the way we frame and explain our research topic, plan our research and receive access, gather data, process and store our data, analyse data and compile our research findings in an ethical and responsible manner. Accordingly, the consent of the organisation was sought to be used as a case study. The anonymity of respondents was also respected. Some other ethical principles that were employed included honesty and avoidance of bias, respect for intellectual property, etc.

CHAPTER FOUR

ANALYSIS AND DISCUSSION OF RESULTS

4.1 INTRODUCTION

This section reports on survey results and analyses data collected through the administration of the questionnaires and unstructured interviews and discusses the findings of the research. After the survey was carried out, the data which was collected was statistically analyzed and interpretations were drawn to address the research questions and objectives outlined in chapter one. The research instruments used were Mean Score Ranking as well as Relative Importance Index. Results gotten from the study are presented using pie charts and tables.

4.2 OUTLINE OF DATA COLLECTION AND ANALYSIS

The questionnaires were directed at thirty-five (35) professionals (15 Senior Managers and 20 Managers) at Blue Skies Ghana Limited, who are involved in the management of the company's day to day activities however only thirty-one (31) of them responded, indicating a response rate of about 88.57%. With the given rate of response, the data can be considered as reliable enough for analysis to be conducted on. This chapter is made up of four (4) subdivisions which have been created to realize the aim as well as the objectives of conducting the research. They are:

- Part A: Demographic Information of the Respondents
- Part B: Supply Chain Management Processes at Blue Skies Ghana Limited
- Part C: Blue Skies Supply Chain Problems and Inefficiencies

- Part D: Ensuring Efficiency and Effectiveness in the Supply Chain Processes of Blue Skies Ghana Limited.

4.3 PART A: DEMOGRAPHIC DATA

4.3.1 Gender of respondents

The demographic characteristics of respondents that were considered in this study included the gender of the respondents, their educational levels as well as their years of experience at Blue Skies Ghana Limited. The demographics gave relevant information concerning the characteristics of the population being studied. For example, it was established, as shown in the Fig. 4.1 below, that 21 of the respondents were male, making up 68% of the total, with the other 10 being female and making up 32% of the total number of respondents.
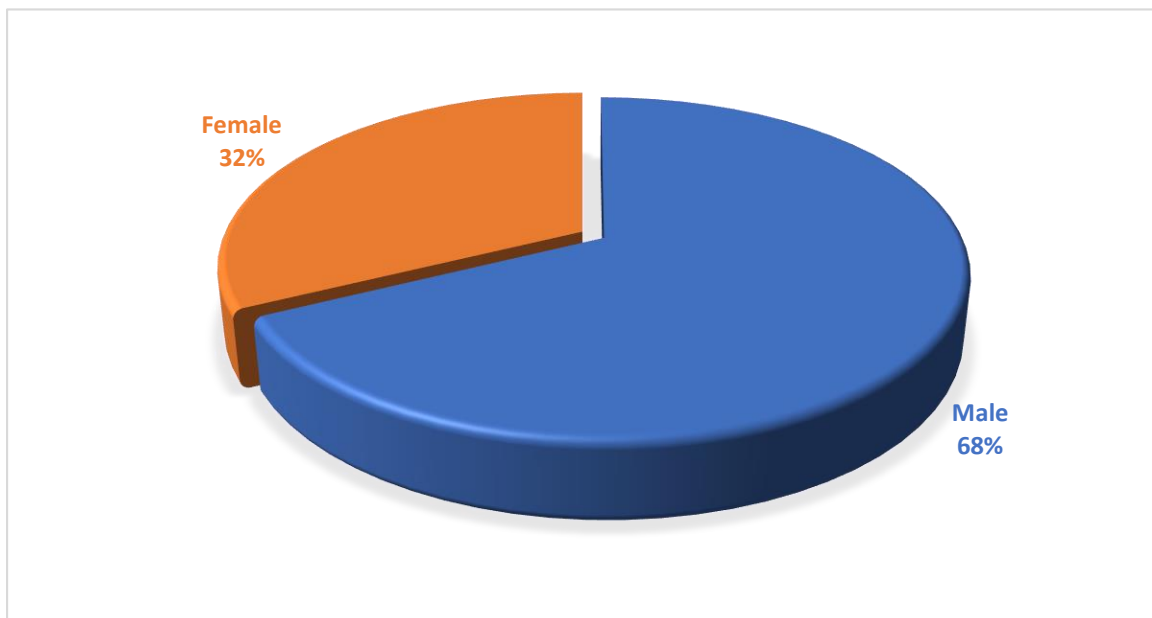
Figure 4.1: Gender of respondents

Source: Author's fieldwork (2019)

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4.3.2 Educational Levels of Respondents

It was also ascertained that 18 of the respondents, making up 58% of the total number of respondents had their highest level of education being a bachelor's degrees, while the remaining 13, making up 42% of the total, had their highest level of education to be postgraduate degrees (Figure 4.2).
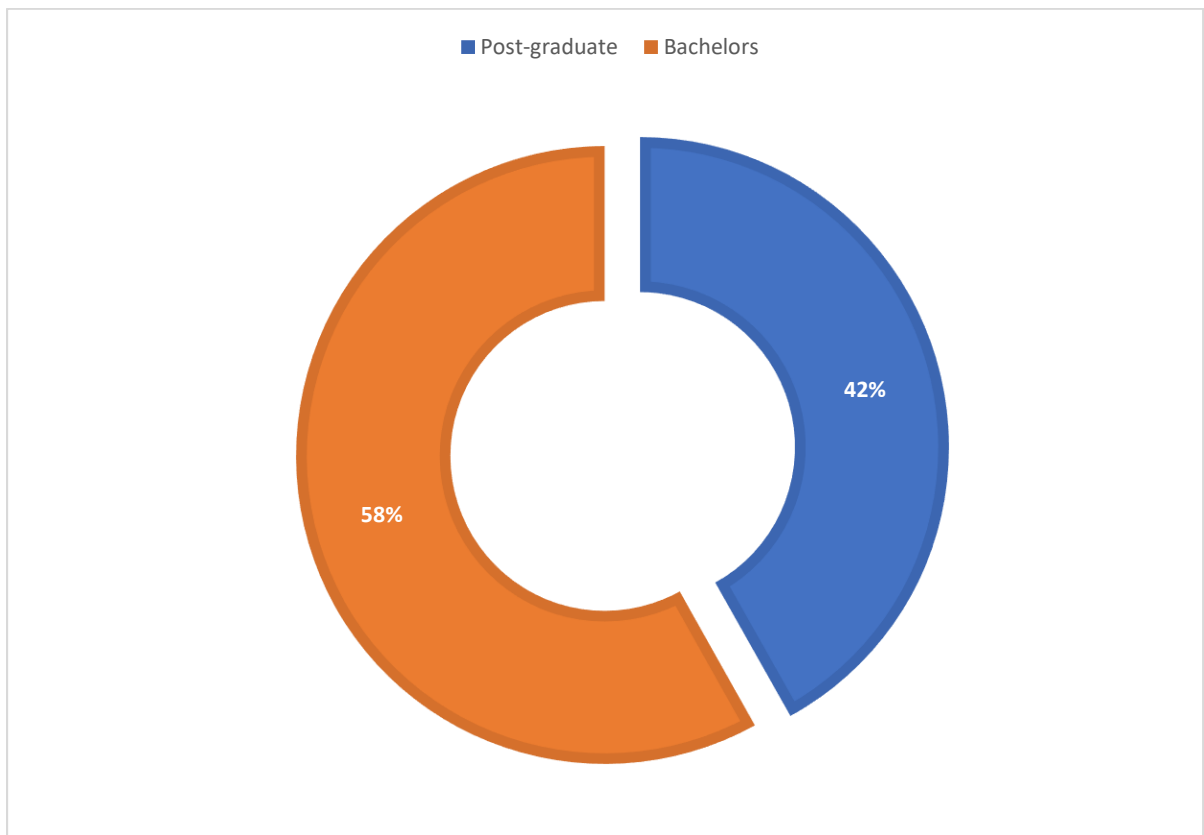
Figure 4.2: Educational levels of respondents

Source: Author's fieldwork (2019)

4.3.3 Years of Experience at Blue Skies

When it came to the work experience of the respondents, as shown in Table 4.1, it was found out that 13 respondents, indicating 41.9%, had worked at Blue Skies Ghana

Limited for 16 years and above, 10 respondents, indicating 32.3%, had 11-15 years of work experience and 8 respondents, indicating 25.8% had 6-10 years of work experience.

Table 4.1: Years of experience at Blue Skies

Years of Experience	Frequency	Percentage
6-10 years	8	25.8
11-15 years	10	32.3
16 years and above	13	41.9
Total	31	100.0

Source: Author's Fieldwork (2019)

4.4 PART B: SUPPLY CHAIN MANAGEMENT PROCESSES AT BLUE SKIES GHANA LIMITED

In line with the first objective of this research, which identified all the individual processes involved in managing the supply pipeline procedures at Blue Skies Ghana Limited, respondents' opinions were sought concerning who was in charge of managing the company's supply pipeline.

4.4.1 Management of the Blue Skies Supply Chain

Figure 4.3 indicates that 20 respondents, representing 64.5% of the total number of respondents thought that the Top-Level Management of the company was in charge of its supply chain management, while the other 11 respondents, representing 35.5%, thought that the company's supply chain was managed by Middle Level Management.
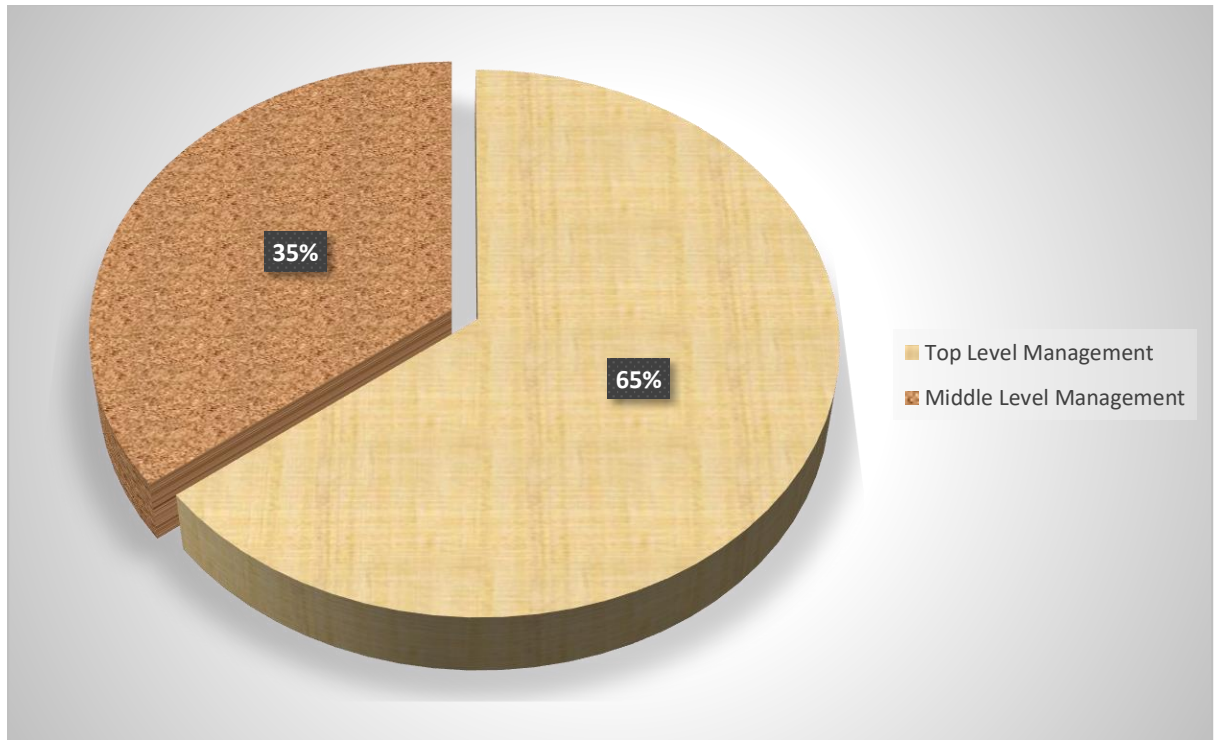
Figure 4.3: Management of the Blue Skies Supply Chain
Source: Author's fieldwork (2019)

4.4.2 Processes Involved in the Supply and Distribution of Agri-Food Products at Blue Skies Ghana Limited

An interview was also conducted with the Site Technical Manager to find out about the procedures involved in the supply as well as distribution of agri-food products at Blue Skies Ghana Limited. Below is a brief summary of the processes:

1. Farmers produce fruits including pineapple, papaw, passion fruit, etc., on contract basis.

2. Farmers transport their produce to the Blue Skies factory at Doboro in the Eastern Region.

3. Factory operatives prepare and process the produce into juice, ice cream or packaged fresh cut fruits. Any waste generated from the fruits is either given to animal farmers to feed their livestock or converted to compost and given to the contract farmers to use during their production of the fruits.

4. Finished products (i.e. juice, ice cream and cut fruits) are dispatched to the Blue Skies Ghana airport hold for movement using refrigerated trucks since the produce is fresh and highly perishable.

5. The aircraft transports the products to the Europe airport hold for movement.

6. Customer-owned delivery vans pick up their consignments from the Europe airport hold. Customers include several supermarkets in Europe like Sainsbury, Tropical Mix, Tesco, Amazon, etc.

7. Consignments are sent to Retailers' depot.

8. Depot distributes to stores.

9. Final consumer buys.

4.5 PART C: BLUE SKIES SUPPLY CHAIN PROBLEMS AND INEFFICIENCIES

4.5.1 Supply Chain Problems at Blue Skies

To determine the problems of the supply chain of Blue Skies Ghana Limited, respondents were presented with an array of issues that are likely to affect agri-food supply chains and were made to indicate the level to which they agreed or disagreed that a particular problem was affecting the Blue Skies supply chain, using a likert scale. Table 4.2 represents the mean score rankings of the problems as indicated by the staff at Blue Skies.

'Lack of good roads and infrastructure', which was ranked as first (1st), with a mean score of 4.10 and a standard deviation of 0.870 was established as the most pressing issue affecting the supply chain at Blue Skies Ghana Limited. Bad road networks make it difficult to transport the fruits from the farms to the blue skies factory and increase the amount of time the fruits spend in transit. Bad roads can also cause bruising of fruits which will in turn increase their rate of perishability (van Zeebroeck et.al 2007).

'Lack of adequate storage facilities' was ranked as second (2nd) with a mean score of 3.84 and a standard deviation of 0.638. This implies that at Blue Skies, the areas for storage of raw materials as well as finished products before they are transported to the airport are not satisfactory. It could also be concluded that the holding areas at the airports may not be in their best shape.

'Availability of only small land holdings to farmers' came in third (3rd) with a mean score of 2.74 and a standard deviation of 0.999. Most farmers in Ghana are small holder farmers and therefore do not have access to large areas of land for farming purposes. This makes it difficult for them to produce substantial amounts of crops because most of their operations are done manually since using mechanization on small pieces of land is not economical (Sims and Kienzle, 2006).

'Lack of cold chain infrastructure' placed fourth (4th) with a mean score of 2.65 and a standard deviation of 0.839. Since all the produce at Blue Skies is fresh, it is important to keep the produce at low temperatures to extend their shelf life and reduce the rate at which they deteriorate (Hua and Zhang, 2010). This can be quite expensive since it

means that the processing factory, the trucks that transport the produce as well as the holding areas must be kept refrigerated at all times.

For the efficient and effective operation of the agri-food supply chain at Blue Skies, the issues outlined above must be tackled in order of importance. The problem with the lowest ranking, with a mean score of 1.32 and a standard deviation of 0.475 was 'The number of product recall cases is growing daily'. This goes to show that Blue Skies is doing a relatively good job when it comes to delivering products of good quality to their customers. We can therefore infer that their customers are generally satisfied with their products.

Table 4.2: Mean Score Rankings of Supply Chain Problems at Blue Skies

No	Problems	Mean	Std. Dev.	Ranking
1	The number of product recall cases is growing daily.	1.32	0.475	10th
2	Lack of proper handling	1.65	0.486	7th
3	Our farmers only have access to small land holdings	2.74	0.999	3rd
4	Lack of adequate storage facilities	3.84	0.638	2nd
5	Lack of proper roads and infrastructure	4.10	0.870	1st
6	Middlemen or Agents who make the supply chain longer	1.58	0.564	9th
7	Agri-food products reduce in value by the time they reach the consumer	1.61	0.495	8th
8	Farmers are illiterate and don't know the modern methods of farming	1.94	0.359	6th
9	Lack of cold chain infrastructure	2.65	0.839	4th
10	Lack of knowledge in supply chain management by chain members	2.00	0.516	5th

Source: Author's fieldwork (2019)

4.5.2 Key Performance Indicators (KPIs)

A Key Performance Indicator (KPI) is a measurable value that demonstrates how effectively and efficiently a company is achieving its key business objectives. The respondents were given a number of KPIs and asked to indicate the extent to which they

agreed that said KPIs were being met by their firm. The results are displayed in Table 4.3 below.

'Customer satisfaction' and 'Product safety and health' tied for first place with mean scores of 4.71 each and standard deviations of 0.461 each. These two KPIs culminate into the quality of the products produced by Blue Skies and as established earlier, their products are generally of high quality.

'Responsiveness' was ranked as third (3rd) with a mean score of 4.61 and a standard deviation of 0.558. This means that Blue Skies is able to react quickly to any unexpected changes in market or customer demand while still reducing its operation costs.

'Volume and delivery flexibility' and 'Return on Investment' ranked 7th and 8th respectively, with the former having a mean score of 3.741and a standard deviation of 0.514 while the latter had a mean score of 3.61 and a standard deviation of 0.715. This goes to show that the respondents thought that for their supply chain to be more efficient and effective, the firm needs to put measures in place to help them to achieve better profits and be more agile when it comes to sudden variations in product volumes and delivery.

Table 4.3: Mean Score Ranking of KPIs

No	KPIs	Mean	Std. Deviation	Ranking
1	Responsiveness	4.61	0.558	3rd
2	Cost of production and distribution	4.32	0.541	4th
3	Return on Investment	3.61	0.715	8th
4	Customer satisfaction	4.71	0.461	1st
5	Volume and delivery flexibility	3.74	0.514	7th
6	Shelf life	4.06	0.250	6th
7	Product safety and health	4.71	0.461	1st
8	Environmental sustainability	4.13	0.341	5th

Source: Author's Fieldwork (2019)

4.6 PART D: ENSURING EFFICIENCY AND EFFECTIVENESS IN THE SUPPLY CHAIN PRACTICES OF BLUE SKIES GHANA LIMITED

In tandem with the last objective of the study which was to establish practices that will aid to ensure efficiency and effectiveness in the supply chain management processes at Blue Skies, the respondents were given a list of supply chain practices and were made to indicate the level to which they agreed or disagreed that a particular practise was being implemented at Blue Skies to help improve the efficiency and effectiveness of its supply chain. Their responses were analyzed using the Relative Importance Index (RII) to help rank the practices according to their significance to the staff at Blue Skies. Table 4.4 represents the results obtained from the analysis.

4.6.1 Practices that will Alleviate Supply Chain Inefficiencies at Blue Skies

From Table 4.4, it is evident that 'Regular supply chain evaluation', 'Pursuing best practices in supply chain management' and 'Ensuring traceability of products are the practices that are being implemented successfully at Blue Skies. These practices reflected the highest RIIs of 0.92, 0.89 and 0.88 respectively. Nevertheless, to ensure that their supply chain productivity is greater than before, Blue Skies need to consider putting measures in place to ensure that the following practices which recorded the least RIIs are implemented properly. They are 'Tackling logistics issues that affect the performance of the company's supply chain' which had an RII of 0.81 and 'Good supply chain relationship with customers', which had the lowest RII of 0.66.

Table 4.4: Relative Importance Index (RII) for Ascertaining Practices that Alleviate Supply Chain Inefficiencies at Blue Skies

NO.	PRACTICES	SUPPLY CHAIN MANAGEMENT PRACTICES OF BLUE SKIES					TOTAL	$\sum W$	MEAN	RII	RANKING
		Frequency of rank									
		1	2	3	4	5					
1	Our company evaluates the performance of its Supply Chain regularly	0	0	0	12	19	31	143	4.61	0.92	1st
2	Our company has an efficient and effective supply chain management process	0	0	0	21	10	31	134	4.32	0.86	5th
3	Our customers are satisfied with the Supply Chain Performance of our company	0	0	0	21	10	31	134	4.32	0.86	5th
4	Our suppliers are satisfied with our firm's Supply Chain Performance	0	0	0	20	11	31	135	4.35	0.87	4th
5	Our company has a good supply chain relationship with its customers	1	9	0	21	0	31	103	3.32	0.66	10th
6	Our company has a good supply chain relationship with its suppliers	0	0	0	21	10	31	134	4.32	0.86	5th
7	Our company is pursuing the best Supply Chain Management Practices	1	0	1	11	18	31	138	4.45	0.89	2nd
8	Logistics issues affect the performance of the supply chain of our company	0	0	9	12	10	31	125	4.03	0.81	9th
9	Our firm develops supply chain management concepts with clients and suppliers in order to achieve our company goals and objectives	0	0	2	18	11	31	133	4.29	0.86	8th
10	Our company has put measures in place to ensure traceability of our products	0	1	5	5	20	31	137	4.42	0.88	3rd

Source: Author's Fieldwork (2019)

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter contains the presentation of the summary of the findings of this study, conclusions drawn from the analysis and also the recommendations. The study began with a set of objectives and review of literature. Data was collected using questionnaires and an unstructured interview. The aim of the study was to determine the practices that will minimize waste and ensure sustainability within the supply chain management processes of Blue Skies Ghana. This section summarizes the main research findings of the study.

5.2 SUMMARY OF FINDINGS

In light of the data analysis conducted in the fourth (4th) chapter of this study, these were the findings that were obtained:

5.2.1 Blue Skies Supply Chain Problems and Inefficiencies

It was found out that the supply chain problem at Blue Skies that has the highest magnitude is their lack of access to good roads and infrastructure. Better roads and infrastructure could ensure that commodities from Blue Skies are fresher on arrival to the consumer, since it will reduce the amount of time that they spend on the road during transportation. Inadequate storage facilities for both raw materials and finished products was also identified as a serious concern. This is because of the highly perishable nature of the products. Poor storage could easily result in the loss and wastage of large amounts of

produce. Another difficulty is the unavailability of large land holdings to farmers, which makes it virtually impossible for farmers to produce on a much larger scale since they cannot adopt farm mechanisation. Manual labour inhibits large scale production.

Another discovery that was made was that in order for Blue Skies to perform more efficiently, they need to do a better job when it comes to their volume and delivery flexibility thus, they should put measures in place to enable them respond quickly to unexpected changes in demands. Return on Investment which can also be termed as profitability is also another key performance indicator whose implementation needs to be reviewed to ensure that the company's supply chain is running efficiently.

5.2.2 Ensuring Efficiency and Effectiveness in the Supply Chain Practices at Blue Skies Ghana Limited.

It was ascertained that out of all the supply chain management practices that were presented to the respondents at Blue Skies, the one that was identified as the main hindrance to the efficient and effective running of the supply chain was their relationship with their customers which was not very good. A better relationship with their customers will go a long way to increase the competitive advantage of Blue Skies Ghana Limited. Logistics issues affecting their supply chain must also be tackled to ensure that their supply chain is working at its highest productivity.

5.3 CONCLUSION

Generally, Blue Skies Ghana Limited has a robust supply chain however, based on the above findings, they are not working at their peak performance. To achieve their peak performance, it is important for them to tackle the issues raised as a result of the study.

5.4 RECOMMENDATIONS

Considering the various findings derived from the study, the researcher made the following recommendations:

- **Logistics plan**- Well planned agricultural products logistics brings about an increase in the value-added to agricultural products, it saves distribution costs, it improves circulation efficiency while reducing unnecessary losses, and helps to avoid market risks (Wang, 2012). Its purpose is to enhance the passages through which agricultural products are disseminated, decrease operating costs of agriculture-related enterprises, and make available faster and improved services to customers of agricultural products (Gebresenbet and Boso, 2012). It is therefore suggested that the organisation should put various plans in place to review and improve its logistics issues.

- **Good customer relationship management-** It allows an organization to manage all its correspondence with its existing patrons as well as plan for its prospective customers. It encompasses the use of technology to organize, automate, and synchronize sales, marketing, customer service, and technical support. Its objective is to produce value for the consumer as well as the organization over an extended time period (Kumar, 2013). Consumers whose needs are being met with goods and services of high quality are very unlikely to switch to other competitors for their requirements. Customer Relationship Management will give Blue Skies Ghana Limited the power to achieve a competitive advantage over their competitors.

5.5 FUTURE AREAS OF RESEARCH

- Multiple Case Study: A single case study was adopted in this study; hence further studies could consider using multiple case studies in assessing the supply chain management practices of agri-food companies to improve its validity.

- Research may be done to assess how collaboration amongst players in agri-food companies impact supply chain performance.

- This study focused on Horticultural products, mainly fruits. Further research could include vegetables as well as ornamental plants or cut flowers, since there is very limited knowledge in those areas.

- Lastly, another area of research that may be considered is the implementation of Blockchain technology in agri-food companies and how it can be used to ensure the efficient running of the supply chain.

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RESEARCH QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF ART AND BUILT ENVIRONMENT
DEPARTMENT OF CONSTRUCTION TECHNOLOGY AND MANAGEMENT

Assessing the Supply Chain Management Processes of Agri-Food Companies to Minimize Waste: A Case Study of Blue Skies Ghana Limited.

Dear Participant,

I am a student at KNUST pursuing a Master of Science degree in Procurement Management.

I am therefore conducting a study to assess the supply chain management processes of Blue Skies Holdings Limited in order to minimize waste and ensure sustainability. This questionnaire seeks to solicit your opinion in this regard as a result of your knowledge and experience.

Your response will be treated as **strictly confidential** and the information will be used for academic purposes only. This survey should take no more than ten (10) minutes to complete. Thank you in anticipation of your participation.

Yours sincerely,

Abigail Naa Dedei Aryee-Atta

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EMAIL: abbynaad@gmail.com

PART A: DEMOGRAPHIC BACKGROUND OF RESPONDENTS

1. **Gender**

[ ] Male

[ ] Female

2. **Please write down your position in the company**

_____

3. **Please Tick [√] to indicate your educational level**

[ ] a. Post-graduate

[ ] b. Bachelors

[ ] c. HND

[ ] d. Secondary education

Others please specify_____

4. **Please Tick [√] to indicate how long you have been working at Blue Skies**

   [ ] a. 5 years and below

   [ ] b. 6-10 years

   [ ] c. 11-15 years

   [ ] d. 16 years and above

PART B: SUPPLY CHAIN MANAGEMENT PROCESSES AT BLUE SKIES

5. **Who is / are involved in managing the Supply Chain processes in your company?**

[ ] a. Top Level Management

[ ] b. Middle Level Management

[ ] c. Lower Level Management

[ ] d. Customers

[ ] e. Supplier

6. **Kindly outline clearly all the processes involved in the production, supply and distribution of agri-food products at your firm.**

_____
_____
_____
_____

PART C: BLUE SKIES SUPPLY CHAIN INEFFICIENCIES AND PROBLEMS

7. **Kindly indicate the extent to which you agree that the following problems are associated with the supply chain management processes of your firm.**
    Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

Problems	1	2	3	4	5
1. The number of product recall cases is growing daily.					
2. Lack of proper handling					
3. Our farmers only have access to small land holdings					
4. Lack of adequate storage facilities					
5. Lack of proper roads and infrastructure					
6. Middlemen or Agents who make the supply chain longer					
7. Agri-food products reduce in value by the time they reach the consumer					
8. Farmers are illiterate and don't know the modern methods of farming					
9. Lack of cold chain infrastructure					
10. Lack of knowledge in supply chain management by chain members					

8. **A Key Performance Indicator (KPI) is a measurable value that demonstrates how effectively a company is achieving its key business objectives.**
    Kindly indicate the extent to which you agree that the following KPIs are being achieved in your firm.
    Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

KPIs	1	2	3	4	5
1. Responsiveness					
2. Cost of production and distribution					
3. Return on Investment					
4. Customer satisfaction					
5. Volume and delivery flexibility					
6. Shelf life					
7. Product safety and health					
8. Environmental sustainability					

PART D: ENSURING EFFICIENCY AND EFFECTIVENESS IN THE SUPPLY CHAIN PRACTICES OF BLUE SKIES GHANA LIMITED

9. Kindly indicate the extent to which you agree with these statements regarding the supply chain management practices of your company.

Scale: 1= Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, 5= Strongly Agree

STATEMENTS	1	2	3	4	5
1. Our company evaluates the performance of its Supply Chain regularly					
2. Our company has an efficient and effective supply chain management process					
3. Our customers are satisfied with the Supply Chain Performance of our company.					
4. Our suppliers are satisfied with our firm's Supply Chain Performance					
5. Our company has a good supply chain relationship with its customers					
6. Our company has a good supply chain relationship with its suppliers					
7. Our company is pursuing the best Supply Chain Management Practices.					
8. Logistics issues affect the performance of the supply chain of our company.					
9. Our firm develops supply chain management concepts with clients and suppliers in order to achieve our company goals and objectives.					
10. Our company has put measures in place to ensure traceability of our products.					