KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF DISTANCE LEARNING

ASSESSMENT OF WAREHOUSING OPERATIONS IN THE COCOA INDUSTRY – THE CASE OF TEMA PORT

BY

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DECLARATION

I, Akomea – Mensah Abrampah, the author of this dissertation do hereby declare that except for reference to other people's work which has been duly acknowledged, the work presented was done by me as a student of the Kwame Nkrumah University of Science and Technology.

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(Student)

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Date…….

Mr. Mohammed Hardi

(Supervisor)

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Date…….

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DEDICATION

This work has been dedicated foremost to the Almighty God. Secondly to my beloved wife, Mrs. Rosemary Akomea-Mensah and my children, Eunice, Edward, Nana Yaa, Awo Yaa and Maame Yaa for their support, love and understanding.

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ABSTRACT

This study aims at contributing to the growing literature on warehousing management in Ghana. Following from years of warehouse management in Cocoa Marketing Company, the warehouses were engulfed with overload of poor warehouse practices. It was against this background that the research was carried out, to assess warehousing operations at the Tema Port as a case study.

The study employed descriptive analysis in assessing warehousing problems of Cocoa Marketing Company. Questionnaire were sent to various stakeholders, who gave their views on various warehousing problems in accordance with how such problems impacted or influence their work. Further evidence showed that there was poor utilization of existing warehouse floor space manned by CMC. Again it was drawn from the findings that not having standardized pallets, short delivery of cocoa, short weight, leakages, inadequate utility service, theft, and lack of labour control were among the problems encountered by Cocoa Marketing Company at the various warehouses.

The study made several recommendations to COCOBOD and for that matter Cocoa Marketing Company. It is recommended that Cocoa Marketing Company should ensure quick evacuation of cocoa to ensure that space was created at these warehouses to accommodate more storage of cocoa. Cocoa Marketing Company should employ bulk storage system in its operation. It was recommended that there should be effective strategy in adopting the FIFO principle, regulating trucks, introduction of weighbridge to speed up offloading process at the warehouses. This study is also the first in helping COCOBOD as well as other Ghanaian business organizations in the cocoa industry to understand the problems warehouses at the Port encountered in their daily operations and how warehousing operations in Ghana as a whole could be improved.

CHAPTER ONE

INTRODUCTION

1.0 Chapter Overview

The chapter forms an introduction to the study on assessment of warehousing problems in the Cocoa industry. It involves the back ground of the study and statement of the problem. The research questions, objectives, significance, scope and limitation of the study are also discussed in the chapter. It also gives a conceptual framework and methodology employed by the study as well as the chapter outline.

1.1 Background

Operations management is a value- adding area of an organization concerned with innovation, production and distribution of goods and services to customers whilst ensuring that the use of original resources remains efficient and effective. It is therefore a discipline that is critical to the sustainability of all organizations, industrial, service, and public sector alike. Supply chain management (SCM) is very important and effective to all companies. Simchi-Levi, David et al (2007), defines supply chain management as “a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system-wide costs while satisfying service level requirements” for example, Coca Cola and Dell.

Supply chain management, also called logistics network, includes suppliers, industrialized centers, warehouses, distributions centers, and retail outlets, as well as unprocessed materials, work-in-progress stock, and finished goods that run linking the facilities. SCM is all about having the right product in the right place, at the right price, at the right time and in the right condition.

SCM has allowed company to rethink their entire operation and restructure it so that they can focus on its core competencies and outsource processes that are not within the core competencies of the company. Due to the current competitive market, it is the only way for a company to survive. The strategy on applying SCM will not only impact their market positioning but also strategic decision on choosing the right partners, resources and manpower. By focusing on core competencies also will allow the company to create niches and specialization of core areas. As stated by Kim and Mauborgne (2006), in order to create a niche for competitive advantage, companies must look at the big picture of the whole process, and figuring out which process can be reduced, eliminate, raise and create.

Operations and supply chain plays very important role in the cocoa industry in Ghana. Cocoa beans which are produced in the forest regions of Ghana have to be transported and warehoused at the three ports, namely Tema, Takoradi and Kumasi (inland) for efficient distribution to the overseas market and the local factories. The beans are purchased by Licensed Buying Companies on behalf of Ghana Cocoa Board and transported by the LBC'S and other private haulers to the ports from where they are distributed to the buyers.

A Warehouse Management System (WMS) is a key part of the supply chain and primarily aims to control the movement and storage of materials within a warehouse and process the associated transactions, including shipping, receiving, putaway and picking. The systems also direct and optimize stock putaway based on real-time information about the status of bin utilization.

The objective of a warehouse management system is to provide a set of computerized procedures to handle the receipt of stock and returns into a warehouse facility, model and manage the logical representation of the physical storage facilities (e.g. racking etc), manage the stock within the facility and enable a seamless link to order processing and logistics management in order to pick, pack and ship product out of the facility. Warehouse management systems can be stand alone systems or supply chain execution suite.

The primary purpose of a WMS is to control the movement and storage of materials within a warehouse – you might even describe it as the legs at the end-of-the line which automates the store, traffic and shipping management. In its simplest form, the WMS can data track products during the production process and act as an interpreter and message buffer between existing ERP and WMS systems.

Warehouses are used primarily by manufacturers, exporters, importers, wholesalers and transport businesses. A warehouse refers to a commercial building that serves as a storage place for goods. The warehouses are usually large plain buildings in industrial areas of cities and towns and are fully equipped with loading docks, cranes and forklifts among others.

The Warehousing and Ports Operations Department is a department under Cocoa Marketing Cocoa that manages all the warehouses at all the three Ports (Tema, Takoradi, and Kumasi). W.P.O. is responsible for taking-over all the Cocoa beans brought by the Licensed Buying Companies (LBC'S).

This mainly involves "receiving" of all the cocoa beans into the various warehouses at the ports, managing them while in the warehouses, and evacuating them to local mills or factories and for shipment. Some of the problems facing the warehousing operations include limited warehouse space, lack of professionalism, poor attitude towards work and poor record keeping.

Although there has been work on warehouse management, I think there hasn't been much work done in the area. The reason for judgment is that most long essays are on warehousing activities, but there is no dissertation on assessment of warehousing problems, so my study I think will cover most of the areas that were not covered. Hence, my ambition to conduct a thorough research in the area of assessment of warehousing operations in the cocoa industry with Tema Port as a case studies.

1.2 Statement of the Problem

Warehousing of cocoa beans transported from the cocoa growing areas in Ghana has been a source of worry and concern to the major stakeholders in the cocoa industry in Ghana, especially during the peak of the cocoa season that is from December to February every year. Truckloads of cocoa beans are not offloaded and warehoused causing traffic congestion in all the three take-over centers (Ports).

In order to solve the above problems, the company, in providing warehousing has to ensure enhancement in its operations. The question then is how does the company do this? This study, using Tema Take-over Centre (Port) as a case study tries to find out how an efficient warehousing management is relevant to the operations of Ghana Cocoa Board.

1.3 Objective of the Study

This research proposal sought to analyze the current situation within the warehousing and ports operations. The objective is to assess:

- The effective management of stocked capacity with emphasis on optimization of warehouse space at the Port.
- How effective warehouse management should be to improve truck turn-around for offloading and subsequent storage planning.
- Procedures and record keeping at the various warehouses or takeover centers at the port.
- Make any finding and recommendations based on the outcome of the above objectives.

1.4 Research Question

Within the context of the problem statement of the study and objectives above, this research will seek to answer the following research questions;

1. What are the benefits of using warehouses in the Operations and supply chain of the cocoa industry?
2. What tools and systems are available for efficient management of these warehouses?

3. Do these warehouses have in place procedures for ensuring effective record keeping at the Tema Port?
4. How truck is turn around affected by warehouse space at Tema Port?
5. In what ways do warehouses contribute in reducing costs and product optimization in the cocoa industry?

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1.5 Research Methodology

This section discusses how the fieldwork was organized and the methods that were used in collecting the relevant data for the study. Both primary and secondary sources were employed for the analysis to achieve the objectives set above. The secondary sources included books of relevant importance to the research topic, journals, magazines, internet and newspapers among other publications.

Besides the secondary data, primary data source were used by preparing questionnaires and interview guides. The primary source focused on Cocoa Marketing Company and Ghana Cocoa Board and other stakeholders. The primary source was used in finding out whether there is effective management of stock capacity with emphasis on optimization of warehouse space at the Port. Secondly, how effective warehouse management should be to improve truck turn-around for offloading and subsequent storage planning, procedures and record keeping at the various warehouses or takeover centers at the port.

The questionnaires were distributed to the target respondents who were officials of Cocoa Marketing Company, Licensed Buying Companies and the Haulers (transporters). This mix of target respondents were chosen because they were mainly aware of the situations at the

various warehouses at the Tema Port as well as had in-depth knowledge about the objectives of the study (since it was a bother to them). Interviews with these officials were conducted to gather information that might not be elicited by the questionnaire during working hours. These questionnaires after its completion by the target respondents were collected personally by the researcher.

After gathering these data through the medium of questionnaires and interviews a thorough analysis was conducted on it. The completed questionnaires and interview results were analyzed based on the responses received. In some cases the field results were compared with the literature where appropriate. Thus the analysis was mainly descriptive in nature and in some cases tabulations were used. The findings were deduced based on the arguments that were raised in both primary and secondary data source which was set out to achieve the said objectives. Following from the findings, conclusions and recommendations were made.

1.6 Significant of the Study

The study is of much significance on the grounds that the cocoa industry would be able to make a lot of savings through the adoption of an efficient warehouse management, which could be use to develop other equally important areas of the industry.

Again this study is highly useful because, with the continuous increase in the yearly output of cocoa and the critical role of warehousing in the cocoa supply chain it is believe that this study addressed the warehousing problems that are experienced by the industry at the peak of every cocoa season.

It is anticipated that the findings and recommendations of the study will serve as a guide for management, policy makers, regulators and practitioners in the cocoa industry. The study will thus harness the monitoring, assessment and review of cocoa warehousing operations and regulation on the subject matter.

1.7 Scope and Limitation of the Study

The major objective of this research is to find out the need for effective and efficient warehousing at the Tema Take–Over Centre (Port). For this reason, an effective and concise assessment will be undertaken on warehousing among staff of CMC, Licensed buying Companies and haulers of Tema Port under the study. In terms of scope, the research covers the assessment of warehousing problems in the cocoa industry, a case study of Tema Port from 2004 to 2008. The study will be confined to the Tema Take-Over Centre (Port) of the Cocoa Marketing Company (Ghana) Limited and few selected Licensed Buying Companies as well as haulers in Tema due to financial and time constraints.

1.8 Organization of the Study

The ensuing chapters are organized as follows; chapter one is the introduction which covers the background to the study, objectives of the study. In chapter two we put into perspective the relevant literature for the research. Chapter three presents the researcher's chosen methods and procedures adopted in collecting, analyzing and the presentation of the report. Chapter four consists of data analyses and interpretation. The final chapter outlines the summary, conclusions and recommendations of the study.

CHAPTER TWO

LITERATURE REVIEW

2.0 Chapter Overview

This chapter describes the context for the essay. It presents an overview of cocoa production and marketing in Ghana. It assesses terminal warehousing within the contexts of the Tema Port take-over center and the Cocoa Marketing Company. A review of both theoretical and empirical studies in Supply Chain Management is equally done with a focus on Warehousing Management Systems. The chapter concludes with an identification of the gap the study fills in warehousing research in Ghana.

According to World Cocoa Foundation report (2006), world production of cocoa beans declined to 3.3 million tons in 2004/05 from an all-time high of 3.5 million tons produced in 2003/04. Much of this decline in global output was due to lower production in the two leading cocoa producing countries – Côte d'Ivoire and Ghana. These two countries suffered most from the weather induced setback in production generally experienced in West Africa during the development of the main crop in the second half of 2004. Production in Côte d'Ivoire fell from 1.41 million tons in 2003/04 to 1.27 million tons in 2004/05. In Ghana, output fell from 740,000 to 590,000 tons in 2004/05 despite a continued government backed mass spraying program to contain losses from pests and diseases. To place the issue of cocoa warehousing problems in context, there is the need to do an overview of the cocoa and warehousing industries in Ghana.

2.1 The Cocoa Industry in Ghana

The cocoa industry comprises different stakeholders and operatives involving Ghana Cocoa Board (COCOBOD), Licensed Buying Companies (LBCs), Haulage companies and finally, the farmers. COCOBOD is the main regulatory institution for the industry; the LBCs buy cocoa at the farm level on behalf of COCOBOD; the Haulage companies transport the purchased and/or sealed cocoa to the depots and the take-over centres on behalf of the LBCs and, the farmers are the primary producers of the crop.

In Ghana, cocoa production and marketing are supervised by the government through its main agency, COCOBOD which comprises of the head office, located in Accra and divisions sited in other parts of the country. The Head Office directly regulates and controls cocoa research, production, quality and extension services as well as the internal and external marketing of cocoa. It enacts policies and regulations to guide all activities of the industry, both pre-harvest and post-harvest. Its specialized divisions see to the implementation of these policies and many other programs of the Board (see Figure 1).

Figure 2.1 Organization of the Cocoa Industry in Ghana

Source: www.worldcocoafoundation.org (2006)

The Cocoa Research Institute of Ghana (CRIG) is the research division of the Board. Primarily, it researches problems related to the production, processing, and utilization of cocoa. Over the years, it has established itself as a centre of excellence providing the farmer with packages of husbandry practices and technologies for optimizing yields and high economic returns under environmentally friendly conditions. The scientific research findings of CRIG are passed on to the Seed Production and Cocoa Swollen Shoot Virus Disease Control Units (SPU and CSSVDCU) to implement for the benefit of cocoa farmers.

2.1.1 Seed Production Unit

The SPU as a Unit of COCOBOD was created from the former Cocoa Services Division (CSD) in January 2001, following the merger of the extension wing of CSD with the Ministry of Food and Agriculture. The rational for creating the SPU can be traced to the problems of low productivity that plagued farmers. By 2001, the total cocoa tree stock in the country was predominated by low yielding Amelonado and Amazon varieties. In addition, trees had grown too old and farms were suffering from general disease and pest infections. Above all, extension services for cocoa farmers had become ineffective resulting in low levels of farm maintenance and other standard practices (www.worldcocoafoundation.org, 2006).

Trees needed to be replaced with new high yielding, early bearing and disease and pest resistant ones. Farmers needed effective extension services. The SPU was created to provide these. Using the research findings from CRIG, the SPU multiplies and makes available to farmers, improved cocoa plants developed from breeding programs of hybrid seed pods and seedlings that are high all-year-round-yielding, early bearing, sturdy and disease resistant.

Production of the improved seedlings and hybrid seed pods is undertaken at the seed gardens established at 23 cocoa stations in the seven cocoa growing regions. The Institute then keeps demonstration farms for farmers to observe the beneficial effects of improved technologies. At residential training session at 23 farmers' hostels out of the 26 cocoa stations, it delivers extension messages to farmers on the application of improved technologies and recommended modern agronomic practices (www.worldcocoafoundation.org, 2006).

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2.1.2 Quality Control Division (QCD)

The grade levels of all cocoa beans must be acceptable to both Licensed Buying Companies engaged in internal marketing of cocoa at buying centers and external buyers to whom cocoa is exported from the ports. Before cocoa can be of merchantable quality, International Cocoa Standards require that it be fermented, dried thoroughly, and free from smoky beans, abnormal odour and any evidence of adulteration. It must also be reasonably devoid of living insects, broken beans, fragments and pieces of shell and foreign matter. Ideally, the beans must also be reasonably uniform in size (www.worldcocoafoundation.org, 2006).

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The Quality Control Division of COCOBOD (QCD) is responsible for ensuring the quality of cocoa, coffee and shea-nut for local and international markets. It starts its post-harvest quality control measures by educating cocoa farmers on acceptable practices for processing cocoa beans to attain the required quality standards acceptable to Licensed Buying Companies at the buying centers. It has the responsibility of inspecting storage sheds and issuing certificates of registration for premises accepted as grading centers or depots. Quality inspection and grading and sealing are performed at District level at centralized points up-country and again at the various ports when the cocoa is handed over.

At the take-over centers, cocoa arrivals are check-sampled by the QCD which advises Cocoa Marketing Company (CMC) either to take-over the cocoa or reject it if the quality falls below the international standards. Staff of QCD stationed in seventy- three (73) operational districts within six cocoa growing regions, carry out inspection, sampling, grading and sealing of cocoa before evacuation to take over points for subsequent shipment or delivery to local processing factories and the international market. At the take-over centers, QCD issues a purity certificate for every parcel of cocoa taken over (www.cocobod.org).

2.1.3 Cocoa Marketing Company (Ghana) Ltd (CMC)

The Cocoa Marketing Company (Ghana) Limited is a wholly-owned subsidiary of COCOBOD and has the sole responsibility for sale of Ghana cocoa beans to local buyers and export to foreign buyers. The company is also in charge of the sale and export of semi-processed cocoa products from the local cocoa processing factories to overseas destinations. CMC has its head office located in Accra and a branch office in London. The major objective of CMC is to sell cocoa to the external market at the best prices obtainable and to undertake its external marketing functions in a manner, which will maximize the foreign exchange revenue of the country.

Cocoa beans sold to external buyers are shipped quarterly while processed cocoa products are shipped every two months. External sales are made by private treaty on the basis of world cocoa market values at the best prices obtained. Any disputes arising between the external buyers and COCOBOD from any exports are settled through arbitration by CMC on behalf of COCOBOD, under the rules and regulations of the Cocoa Association of London.

Generally, a sale is done on the cash-down basis or on the establishment of letters of credit and the company collects all sales proceeds on behalf of COCOBOD.

A restructuring program by COCOBOD in 1985 tasked CMC with the additional responsibility of performing take-over functions within the internal marketing system. The take-over functions involve the receipt of cocoa from Licensed Buying Companies and the performance of critical functions such as cocoa warehousing and other pre-shipment activities at the take-over centers of Tema, Takoradi and Kumasi (www.worldcocoafoundation.org, 2006).

2.1.4 Licensed Buying Companies (LBCS)

In 1991/92, the cocoa sector in Ghana was partially liberalized. Internal buying of cocoa from farmers was opened to private sector participation. Companies were licensed by COCOBOD to buy the cocoa from the farmers (Licensed Buying Companies (LBCs)) and supply to designated ports. The LBC sources and buys the cocoa from the farmers, standardizes it in export ready bags, ensures that the quality is maintained and meets the stringent QCD parameters and transports it to the port for handing over to the CMC. This activity is performed for a fixed price, on a per ton basis. Buying agents called Purchasing Clerks buy and collect the cocoa and a primary evacuation process from the producer to a central point is done. At the central point, it is warehoused or stored for grading and sealing. Subsequent to acceptance of the quality, a secondary evacuation is done by haulage companies via specified routes to designated takeover centers at the various ports (www.worldcocoafoundation.org, 2006).

2.2 Warehousing and Storage

A warehouse is an essential limb of the industrial unit. It is the depository of all materials required by all industrial units and supplies materials as and when required. The variety of items stored is so large that a planned system is necessary to keep them safely and in order. The stored items should be identified and issued with minimum efforts and in minimum time. This calls for the following:

- An organizational structure suitable to carry on various activities efficiently and productively.
- Defining the functions and duties of each focal official.
- Developing systems for the standardization of operations and uniformity in actions.
- Developing and maintaining records for proper accounting, management information and analysis (Saxena, 2003).

Recent pressures on logistics, increasing customer service levels, inventory reduction, time compression and cost minimization have changed the structure of supply chains and the position and working of warehouses within the supply chains. Warehouses come in all shapes and sizes, from facilities of a few hundred square meters handling modest throughputs, to large capital-intensive installations with storage capacities in the 50,000 plus metric tons range.

Warehouses exist primarily to facilitate the movement of goods to the end user. Since warehouses, storage and distribution centers should operate as integral components of supply chains, key decisions when setting up such facilities must be determined by the overall

logistics strategies for service and cost. Rushton, Alan et al (2000) identify the factors that should be considered in establishing a warehouse to include the following:

i. Market and product base stability – Long-term market expectations for growth and for how the product range may develop will influence decisions on the size and location of a warehouse facility, including space for potential expansion.

ii. Type of goods to be handled – Goods handled can include raw materials, work in progress, spare parts, packaging materials and finished goods. Subject to material types, sizes, weights, product lives and other characteristics, special requirements for temperature and humidity may also have to be met and all of these will impact on the type of warehouse and technology level.

iii. Type of facility, size and location – The type of operations, design capacity, size and location of the warehouse will all be influenced, if not directly determined, by its specific role and position in the supply chain, and the role, capacity and location of any other facilities in the chain. The customer base, amount of inventory, the need for inventory reduction, time compression in the supply chain and the overall service levels should all be considered when deciding on the type, size and location of the warehouse.

Warehousing takes up to between 2% and 5% of the cost of sales of a corporation (Rushton et al, 2000) and with recent renewed corporate emphasis on Return on Assets, minimizing warehousing costs has become an important business issue. In today's highly competitive global business environment, many firms are automating their basic warehousing functions to

achieve the increase in throughput rates or inventory turns required for their warehousing operations to be cost effective. At the same time, continued emphasis on customer service exacerbates the quandary of warehouse managers looking for ways to trim costs and improve customer service at the same time (Frazelle, 2001).

2.3 Role of Warehouses

In its most basic form, warehousing is simply holding goods until they are needed. Oftentimes, a distinction is made between finished goods warehouse and a raw materials store room. The fact, however, is that the functions performed in a finished goods warehouse, receiving, storing, picking and shipping, are identical to the functions performed in a raw materials storeroom. Consequently, both are warehouses. The only true distinction between the two the source from which the goods are received and the user to whom the goods are shipped. A raw materials storeroom receives goods from an outside source, stores the goods, picks the goods and ships the goods to an inside user. A finished goods warehouse receives goods from an inside source, stores the goods, picks the goods and ships the goods to an outside user (Rushton et al 2000).

Likewise, an in-process inventory warehouse receives goods from an inside source, stores the goods, picks the goods and ships the goods to an inside user, while a distribution warehouse receives goods from an outside source, stores the goods, picks the goods and ships to an outside user. The differences among these various warehouses are restricted to the perspectives of the sources, management, and user of the goods. If the primary functions of a facility are receiving, storing, picking, and shipping, then that facility is a warehouse, regardless of its position in a company's logistics.

According to Rushton et al. (2000), reasons for holding stock and for continuing to have warehouses and distribution depots in supply chains include the following:

- To provide a buffer for smoothing variations between supply and demand.
- To enable procurement savings through large purchases.
- To provide a wide range of different products from different suppliers in one location.
- To cover for planned or breakdown production shutdowns.

The resources of a warehouse are space, equipment and personnel. The usefulness of a warehouse resides in the effective use of its resources to satisfy customer requirements. Customer requirements are simply the demand to have the right product in good condition at the right place at the right time. Therefore, the product must be accessible and protected. If a warehouse cannot meet these requirements adequately, then the warehouse does not add value to the product and in fact very likely subtracts value from the product. Based on the assessments of a warehouse's resources and the customers' requirements, the primary objective of any warehouse management system is to maximize use of warehouse space, equipment, labor, accessibility and protection of all items as well as information. Warehouse space in particular takes up a very significant proportion of total warehouse costs and must be used effectively. Considerations for effective space utilization include:

minimizing total stock-holding and eliminating obsolete stock

i. careful selection of appropriate storage and handling systems
ii. effective use of building height
iii. minimizing aisle numbers and widths consistent with access and safety

iv. use of random location systems for stock rather than fixed locations (Rushton et al 2000).

2.4 Warehousing Management Systems

A Warehousing Management System comprises a number of interlinked systems – storage and handling, information and quality assurance. According to Rushton et al (2000), the storage function is the single major consideration in designing a warehouse; ostensibly because storage occupies more space than any other activity in the warehouse, and hence accounts for a significant part of the building costs. Operationally, storage systems impact on stock management as well as product protection and integrity. According to Ruston et al, the key factors influencing the choice of a storage system are:

a) the nature and characteristics of the goods and unit loads held
b) the effective utilization of building volume – horizontal and vertical
c) good access to stock
d) compatibility and information system requirements
e) maintenance of stock condition and integrity
f) personnel safety
g) overall system cost

In selecting equipment for the storage of items, the following factors should be taken into consideration:

- the equipment should be appropriate or suitable for the items to be stored
- the equipment should provide protection for the items warehoused

- the equipment must be capable of retaining what is stored in, that is, items must not be able to fall out of the equipment.

In a Warehouse Management System, the handling systems are designed to maintain the product in a suitable state for the final customers. This implies minimizing damage, loss or deterioration, satisfying stock rotation or product life requirements and meeting any legal constraints on storage environment such as temperature limits (Rushton et al 2000).

Safety has always been of prime importance in warehousing because of the amount of movement, lifting and manual handling involved. Even with the levels of mechanization and automation in some modern installations, safety is still of key importance. Safe working practice is a moral obligation and also makes economic sense by minimizing lost staff time, the costs that can be incurred in accident investigations, and the possible legal costs and claims that may be incurred. Packaging is an integral part of the supply chain and the design and use of packaging impact not only on storage and handling, but also on other functions such as production, marketing and the most appropriate type of unit load to be used (Rushton et al 2000).

The unit load concept puts products into appropriate standard modules for handling and storage, movement, loading and unloading. A unit load is an assembly of individual items or packages, usually of a like kind to enable convenient composite movement, whether manual or mechanized. Examples include pallets of goods or other materials (roll cage pallets, post pallets, cage pallets and ISO containers). The benefits of effective unitization include moving maximum quantities of goods per journey, minimizing the number of movements and

generally facilitating the interface between warehousing and transport operations including vehicle loading and unloading. (Rushton et al 2000). The unit load concept enables the use of standard equipment irrespective of the product being handled, thus achieving product protection, security and economy in the use of space.

2.4.1 Creating Warehouse Space

Warehouse typically bills its own expenses by the square-foot (for example, rent of the building, climate control, cleaning and so on); the warehouse naturally wants many pallets per square foot. This is achieved by taking advantage of the vertical space and by using deep lanes. Stack height and lane depth is very important as far as spacing is concerned.

According to Bartholdi and Hackman (2008), pallets that can be stack high, allow many pallets position per square foot of floor space. Bartholdi and Hackman also made mention of lane depth. That is space for aisles can not be use for storage and so is not directly revenue generating. Consequently aisles space is reduced to the minimum necessary to provide adequate accessibility. Thus the aisles must be at least wide enough for a forklift to insert or extract a pallet.

2.5 Transportation-Production Cost Reduction

Transportation cost becomes less expensive when goods are hauled in economically large quantities. Warehousing helps this to be achieved when goods are stockpiled to allow for large volumes to be consolidated, helping fill truckloads or shiploads. Ballou (1999) posited that per unit transport cost is thus reduced as a result. Warehousing, thus allows transportation to be well planned and coordinated to prevent waste. Production costs on the other hand could

be reduced because supply points draw from warehouse stocks rather than placing orders directly on the production points, which often cause changes in the production schedule.

2.6 Information System of a Warehouse Management System

According to Rushton et al 2000, the functionality of the information system of a Warehouse Management System revolves around the following:

- logging stock movements and maintain balances.
- controlling stock location.
- monitoring productivity and the utilization and availability of resources such as handling and storage equipment.
- tracking the movement of goods through the system, effective and ideally instantaneous communication between operators and the management system.
- sorting order requirements into appropriate order picking tasks.
- planning optimum movement routes including order picking.

The Quality Management System is designed as an intrinsic component of all the systems constituting a Warehousing Management System. Items in a warehouse tend to lose their quality if they are not properly handled or stored or transported (Schensleben, 2000). A healthy Quality Management System entails continuous monitoring of the quality of items throughout the various activities involved in warehousing – handling, storing, packing and delivery (Saxena, 2003 p. 145). Quality assurance is meant to ensure lower rates of defects and customer complaints. A high complaint rate invariably indicates that the Quality

Management System of the warehouse is ineffective and can lead to customers looking elsewhere for supplies (Christopher, 2002)

The choice of a warehousing system depends on the trends and pressures in an industry (Scholten, 2000). Scholten enumerates the following factors as those bringing about change in both the economic and technical conditions of a warehousing system:

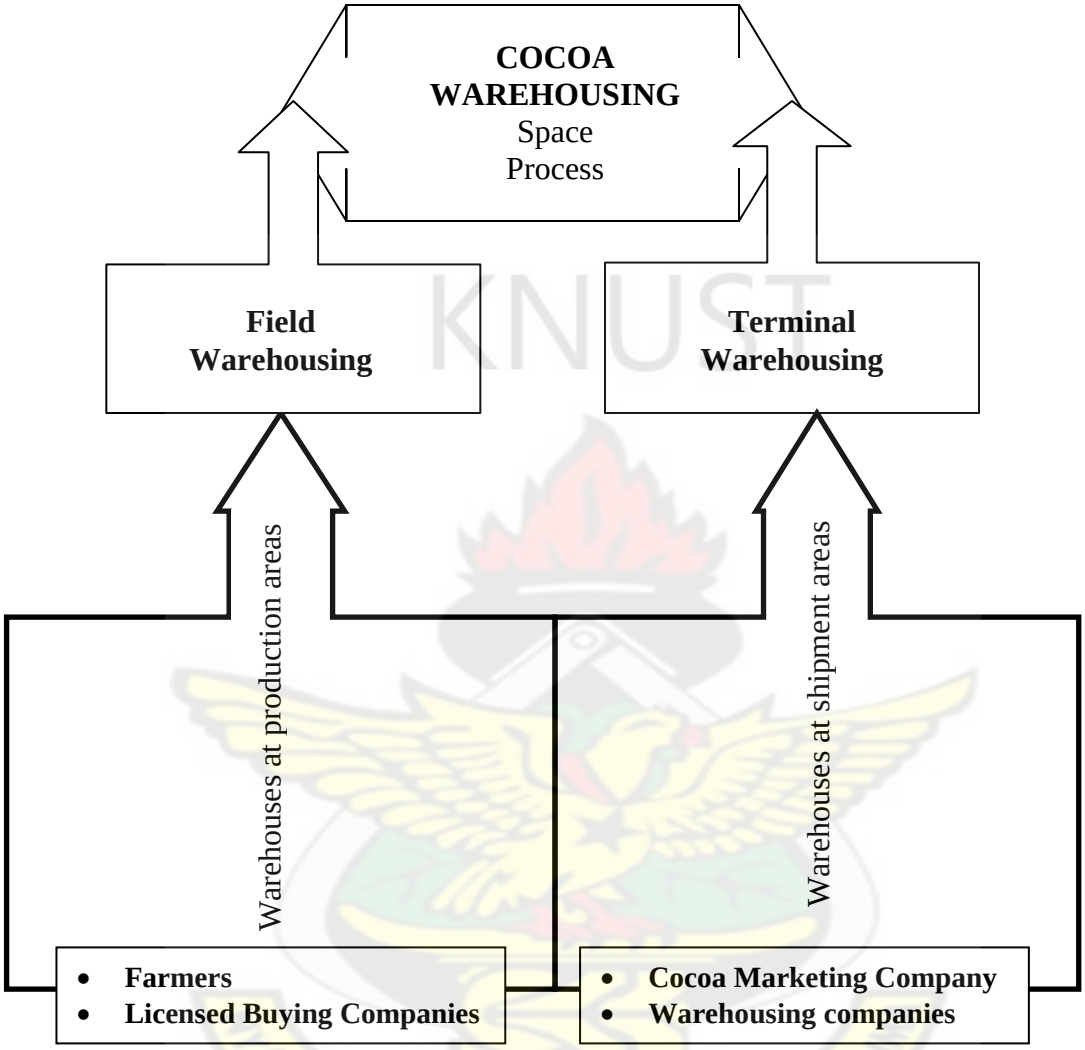
- shifts in consumer demand patterns
- cost pressures on the industry
- progress in computer technology

In their choice of a Warehousing Management System, firms therefore often have to adapt to the dynamics of the industry. According to Frazelle (2001), the process of selecting, justifying and implementing a Warehouse Management System (WMS), when effectively done, can raise a warehouse to world-class status and if poorly carried out can set the firm back ten years.

2.7 Cocoa Warehousing

Warehousing (storage) follows directly after production. The critical role of warehousing in the cocoa supply chain is apparent from the fact that it precedes sale and export. Investigating warehousing problems in the cocoa industry can therefore be regarded as half of the solution to problems associated with increasing profitable sales and export. Problems of cocoa warehousing can be denominated under space availability and quality control.

Figure 2.2 Cocoa Warehousing



Source: www.worldcocoafoundation.org

From the schema above, the effectiveness of warehousing cocoa in Ghana hinges on space availability and efficient warehousing processes that assure the quality of cocoa beans. Warehousing is done at two major levels – in the field at the production areas by farmers and LBCs and at the take-over centers by the Cocoa Marketing Company.

Cocoa is brought into their village level depots by the farmers and quickly moved to larger sheds of the LBC's. Shed gangs build the bags of cocoa into stacks by hand or sometimes mechanically using high-mast battery-operated forklifts. Every effort is made by the dealers to avoid storing cocoa in the open, but where this is unavoidable pallets are doubled to prevent problems from ground moisture and the produce covered immediately with a durable tarpaulin (Jonfia-Essien, 2002). The cocoa is then transported to the district warehouse and, at the district warehouse the bags are standardized to meet export regulations. The QCD is then called in to check the quality. They perform a cut test and bean count onsite; and grade and seal the bags for onward movement to terminal warehouses at the ports.

The cocoa industry has not been impervious to changing market trends. Traditionally, cocoa beans were stored and transported in bags owing to the difficulties associated with bulk storage. But modern bulk storage have overcome this problem and today European buyers prefer to make savings on bags and labour by receiving the cocoa in bulk (GHPA, 2006). Unicontrol Commodity Company (Gh) Limited (UCC), a subsidiary of the Dutch group, Unicontrol Holding B.V., which was established at the Takoradi Port, now operates an innovative bulk storage and ship-loading facility for cocoa beans handling over 200,000 tons annually. The company operates three warehouses in Takoradi with a total capacity of 30,000 metric tons. The warehouses are equipped with mobile weighing surveyor belts, pay loaders and hoppers with scales attached (Unicontrol Commodity, Handbook on bulk cocoa handling).

2.8 Records Keeping and Procedures at Cocoa Marketing Company

The records and documents enable proper cost computation, cost control, and management reporting. Store records should be able to provide up-to-date stock level of all items at all times, and the stock level in the record should tally with the physical stock balance of the items. This will provide the desired safety for the items and help in avoiding any pilferage and theft (Saxena, 2003)

According to the operational manual of COCOBOD, WPO Department there should be pre-planning considering offloading, shipment and factories. The offloading entails trucks availability, quota allocated to each shed, available space and unstacked cocoa. The Licensed Buying Companies (LBC's) are expected to submit waybills for offloading before preplanning meetings by 2.30pm. These waybills are kept in arrival register for Warehousing and Port Operations, Security and Audit Departments. The waybills receipts from the LBC's have to meet COCOBOD directed quota system and availability of space. These waybills are then handed over to depot keepers.

Depot keepers after receiving the waybills from the arrival desk have to properly scrutinize and posted into the arrival ledger at the shed level. The LBC's trucks are then allocated to points for offloading, on the basis of first come first to be offloaded. The Warehousing and Port Operations staff has to check and recheck quantity of cocoa carried by the vehicle during and after offloading. These checks entails the quality of cocoa beans certified by Quality Control Division, Cocoa weighing 64 kg to be accepted at each shed, scale in good working condition and the jute sacks should meet the required standard.

Cocoa presented for offloading without station marks and seal are confisticated. Depot keepers shall keep detailed stack history records. All stacks built shall have tags, which detail the content of the stack and handlers. The depot keepers shall prepare field reports on the day's transactions. These transactions involve offloading, factory deliveries, transfer of cocoa from one shed to another and shipment. Depot keepers critically examine entries in field notebooks of clerk before preparing field reports.

Cocoa Taking-Over Receipts (CTOR's) preparation and processing are prepare within 24 hours of offloading. The staff should ensure timely preparation of all documents. With respect to shipment proper record keeping and monitory shall be adopted and adhere to strictly. Good tallying and counting are executed by WPO staff since that has far reaching effect on stack position. Containers and seal numbers must be well noted and recorded. Information relating to the vessel being located should thoroughly be known by staff. These are some of the critical issues that are kept on records at the warehouses at the Port

2.9 Criticism of Warehouse/Stores Division

According to Saxena (2003), the stores division/warehouse is often criticized for various reasons, some of which are genuine problems faced by the users and could be overcome by proper planning and organization. Some issues are difficult to resolve due to limited resources at the command of the stores. The main criticisms are:

2.9.1 Poor inventory control

Maximum and minimum levels are not maintained properly. Normal items of regular consumption such as cocoa in our case are frequently out of stock. Replenishment of materials is not done with efficiency. There are a number of obsolete items in the stores. There is no control over the slow moving and non-moving items (Saxena, 2003).

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2.9.2 Improper store-keeping

Materials are not stored properly which result in spoilage. Important and costly materials are stored in open yards. Some items are found at two different locations. Items stored in more than one store are not linked.

2.9.3 Delays in inspection

Delays in inspection of items received in the stores. Timely information is not given to the user for inspection of the items. Mistakes in counting the quantity of the materials and in some cases even incorrect identification of the items.

2.9.4 Poor records keeping

Records are not up to date. Retrieval of information takes too much time. Store records are not reliable. It takes a long time to establish the correct status of the stock.

2.9.5 Delay in reporting

Reports on critical items are not submitted to management on time.

Empirical literature on space availability and process effectiveness in cocoa warehousing is scanty. An assessment of problems associated with space and warehousing management in the cocoa industry is therefore a useful addition to the literature.

In conclusion, the literature recognizes that, a good warehouse provide enough space to handle materials in large quantities, which enhance offloading of materials from trucks as well as reducing cost of transportation and truck turnaround time. However the warehousing facilities for storing cocoa at the Tema Port is bedeviled with a lot of problems such as limited warehouse space which affect the storage of enough cocoa beans at these warehouses. This situation adversely affects the foreign exchange to be earned by COCOBOD and Ghana as a whole. Hence assessing these problems and recommending measure to minimize such exposures (Saxena, 2003).

CHAPTER THREE

METHODOLOGY

3.0 Chapter Overview

The research sought to study cocoa warehousing at the Tema Take-over Center where cocoa is finally handled for export to overseas markets and for sale to local factories. COCOBOD is the statutory institution mandated by law to manage the cocoa industry. The Board's restructuring program of 1985 tasked Cocoa Marketing Company (CMC), its wholly-owned subsidiary, with the additional responsibility of performing take-over functions within the internal marketing system. CMC's performance of this function within the Tema Take-over Centre is the focus of this research.

The Tema Take-over Centre is managed by an Area Coordinator together with five heads of departments. They supervise the receipt of cocoa from the LBCs into warehouses. The warehouses are manned by depot keepers, who are all employees of Cocoa Marketing Company. Apart from C.M.C (GH) Ltd., other stakeholders involved in the handling and shipment of the crop at take-over centers are the Quality Control Division of COCOBOD, Ghana Ports and Harbours Authority, Haulers, Inspection Companies and Shipping Agencies. Policy direction in terms of logistics, handling, warehousing and shipment of cocoa is the preserve of COCOBOD management.

By examining the relationship between warehousing and cocoa output, the study assessed the extent to which an improvement in warehousing management can enhance cocoa marketing.

It adopted largely non-technical approach combining mainly qualitative and in some case quantitative tools where appropriate.

The study focused mainly on qualitative and techniques in its methodology employing desk research, direct observation and semi-structured interviews as data collection tools. This approach created data overlapping which facilitated cross-validation of the data.

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3.1 Observation and Desk Research

The Desk research technique entailed extensive examination of secondary data in publicly available records of institutions such as the Ghana Cocoa Board, Cocoa Marketing Company (GH) Ltd., Commodities Processing Industries Ltd., Ghana Ports and Harbours Authority and Licensed Buying Companies. Other sources of secondary information used in the study included books, journals, newspaper reports and other research works.

Direct observation involved an examination of the physical characteristics and activities cocoa warehousing by CMC and other participants at the Tema Take-over Center. With the observation technique, the researcher becomes a participant and an observer at the same time (Kwabia, 2006). Adopting it was justified because the researcher is a staff of CMC and is directly involved in the warehousing activities of the company at the Tema Take-over Center. The researcher therefore has first-hand or frontline knowledge about most of the significant aspects of cocoa warehousing management at the Take-over Center. The information from observation and desk research generally provided a foundation on which to understand the answers of respondents that participated in the unstructured interviews.

3.2 Semi-structured Interviews

Interviews provide a primary source of data collection (Dwumfour, 2006). Semi-structured interviews were conducted with members of the various stakeholders in the cocoa warehousing at the Tema Take-over Centre during working hours.

3.3 Sample Selection and Data Collection

The ideal sample should comprise employees of all stakeholders in cocoa warehousing. But the impracticality of surveying the entire population has been pointed out by several researchers (Dwumfour, 2006). Employees with the relevant technical, operational and functional backgrounds were therefore purposively sampled from stakeholders involved in the handling and shipment of cocoa at the Tema Take-over Center – CMC Ltd., Quality Control Division of COCOBOD, Ghana Ports and Harbours Authority, Haulers, Inspection Companies, Shipping Agencies, Olam Ghana Ltd., and Armajaro Ghana Ltd (AGL). One-on-one interviews were then conducted with the sample. The sample of the target respondents was fifty (50).

In each instance, individuals known or introduced to the researcher were contacted which led to other employees being recommended to be contacted. This process was not only helpful, it was necessary to gain access to individuals with relevant functionality in the study area and to overcome mistrust between researcher and respondent. The interviews were focused on warehousing problems in the cocoa industry. Respondents were also asked to provide their own views about how the problems impacted on the health of their businesses and the marketing of cocoa in Ghana. Interviews with these officials were conducted to gather

information that might not be elicited by the questionnaire during working hours. Basically, the interviews included discussions on the role of assessing warehousing problems and some prominent areas in enhancing cocoa warehousing.

Respondents were told that their responses would be kept confidential. This was done to ensure that the respondents candidly expressed their views. Out a total of 50 people contacted 40 participated (Response Rate = 80%). This high response rate was made possible through the following steps:

- Assuring respondents of anonymity and confidentiality
- Stating the contribution of the study to improving cocoa warehousing in Ghana
- Keeping the length of the interviews short so each could be completed in an average of 20 minutes or less.

3.4 Method of Analysis

In principle, there are several techniques of analyzing warehousing problems and their association with the cocoa industry. Invariably however, the analysis and interpretation of raw data is the means by which research questions are answered (Iddrisu, 2007).

The approach of data analysis used in this study was descriptive in nature. Charts and diagrams were used to organize summaries and make illustrations. Responses from the semi-structured interviews are summarized and analyzed to provide a general picture of cocoa warehousing problems from the perspective of stakeholders. Information thus obtained is combined with information gathered from direct observation and secondary sources such as

records, reports and newsletters to investigate the association between warehousing management and cocoa marketing.

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CHAPTER FOUR

DATA PRESENTATION AND ANALYSIS

4.0 Introduction

This chapter holds within itself the presentation and analysis of data gathered from the field to describe vividly, consistent patterns in the data as the results may be studied and interpreted in a concise and meaningful way. Findings emanated from analysis of the study are presented in this chapter.

It is important, we call back to mind the objectives the research seeks to achieve. Our purpose for conducting the study was to explore:

Firstly, management of stock capacity with emphasis on optimization of storage space at the Port. Secondly, how effective the warehouse management should be to improve truck turn-around for offloading and subsequent storage planning. Thirdly, how procedures and records keeping at the various warehouses of Cocoa Marketing Company at the Tema port is done.

The analysis of this study was based on responses from three target groups on a purposive basis, who were the Licensed Buying Companies staffs at the various warehouses, the transporters of the cocoa bean from the up country to the Port and management staff of Cocoa Marketing Companies.

4.1 Types of Warehouses at the Tema Port

Respondents were asked to indicate, the types of warehouses available at Tema Take-Over Center. Over 50% also claimed that the warehouses were mainly high capacity warehouse with heavily built floors to support heavy duty equipment. About 20 % of the respondents said most of the warehouses were the semi-detached and ventilated type. 10% of respondents claimed, with the exception of built warehouses at community three, the rest are dual purpose warehouses. The rest also claimed that the warehouses at the Port were unbounded warehouse type.

4.2 Main Activities of Warehouses at the Port

There was a 100% response rate with regards to the main activities carried out at these warehouses. However the answers provided differed. Majority of the respondents asserted that the main activities were receiving cocoa from licensed buyers from up-country and storing or preparing the cocoa beans shipment and evacuation to factories. Another major activity was stacking of cocoa beans. Other activities were offloading of cocoa into containers for shipment, loading cocoa on trucks for shipment and storing of cocoa sacks. The last activity mentioned by some respondents was the handling of discrepant cocoa. Though these were the main activities carried out at the warehouses, the stacking of the cocoa bean in bags was not well done. According to Saxena (2003), bricks are supplied on pallets and can be stacked up to recommended heights. Similar procedure is done in stacking cocoa beans, but in most of the warehouses the pallets on which the cocoa beans in bags are packed are different in shapes and these affect the stacking of cocoa beans in sacks to the recommended height in most cases.

4.3 Reasons Accounting for Congestion at the Warehouses

Competition for warehouse space was a major factor accounting for congestion at the Take-over Center, as confirmed by a 100% response rate. Amongst the reasons accounting for congestion of warehouse space at the port are given below. The first factor was the limited warehouses at the Port. Other respondents also claimed under utilization of existing floor space. About 90 % of the target respondents claimed there was poor utilization with warehousing of cocoa beans in bags. Majority of the respondent said the space left between stacks to allow for movement during order picking, take much of the floor space. They were of the view that these space could be use optimally to improve on the stock capacity of these warehouses. However, the end result of the unused space, is the limited number of cocoa bags stored at these warehouses. As a warehousing and Port Operations Officer of CMC concludes: "The pallet for stacking took a lot of space. He categorically stated that the bulky nature of the pallets utilized a lot of space, which could have been used in storing more cocoa beans in bags at these warehouses" (interview, July 14, 2009). Another reason was haulers or transporters non-compliance with the quota specified. Added to the above, was lack of good supervision to build good stack as well as workers attitude to handling the work at the warehouse. Mention were made by some respondents that, a crucial factor accounting for the congestion was the delay of shipment to abroad.

Table 4.1 Effective Utilization of Stock Capacity at the Warehouses

Details	Number of Responses	Percentage Response
Quick evacuation (local factories or shipment) of cocoa as well as bulk storage	24	60%
Meeting customer request of cocoa on time.	7	17.5 %
Replenishment of the warehouse with new stock of cocoa bean in bags.	4	10%
Transporter meeting the quota system	3	7.5 %
Inspection of stocks.	2	5%
Total	40	100%

Source: Interview, July 14 2009

On the issue of whether the stock capacities of the warehouses were effectively utilized, as many as 60% of the respondents indicated that quick evacuation of the cocoa was paramount in ensuring effective utilization of stock capacity at the warehouses. Added to the above point was bulk storage (raw beans storage) could maximize use of space. Meeting customer request of cocoa on time, replenishment of the warehouse with new stock of cocoa bean in bags, transporters meeting the quota system and inspection of stocks obtained 17.5%, 10%, 7.5% and 5% respectively. Thus the results showed that quick evacuation of cocoa and meeting customer request of cocoa on time was the most effective way of utilizing the stock capacities at the warehouses.

The respondents were asked measures employed to minimize the cost of managing warehouses at the Port. Amongst the measures mentioned were as follows:

- Acquiring new warehouses.
- The use of conveyer belts and forklifts.
- Employing professionals.
- Avoidance of double handling.

- Just in Time Management.
- Strict adherence to quota system for licensed buying companies.
- Regulating the movement of the cocoa from the hinterlands to the port.
- Direct delivery of stock (Cocoa) from outstations (eg. Kaase) to the factories.

4.3.1 Problems Confronting Warehouse Management at the Take-Over Center

- Building of Kamplin Stacks.
- Not having standardized pallets
- Congestion during bumper harvest.
- Lack of control over the labourers.
- Short delivery of cocoa.
- Short weight.
- Space taken over by conveyers which are not utilized.
- Inadequate logistics, professional, and unnecessary bureaucracy and lack of initiative.
- Leakages, lack of utility service and poor floor.
- Theft
- Lack of water for carriers to take their bath after a long working day.

Still on the problems confronting warehouse management, the respondents were asked, whether it occurred on a yearly basis. Out of the 40 respondents who answered the questionnaire, 100% claimed that the problem of managing the warehouses at the Tema Take-Over Centers occurred every year.

4.3.2 Measures put in place in Minimizing Warehouse problems at the Port

A critical analysis of the responses revealed that about 94 % were of the view that there were measures to minimize the exposure of these warehousing problems. However, 6% of the respondent asserted that no measures were put in place. The most crucial of the measures put in place was strict supervision in ensuring good stacking and proper management system to take care of the warehousing operation at the Port. Less than half of the respondents claimed that COCOBOD has as part of its strategic plan to acquire new machines and equipments for operations at the warehouses. About 20% claimed that rental of private warehouses at Tema was another measure taking by COCOBOD. Again 10% of the targeted respondents strongly believe that the quota system put in place to regulate the inflow of articulated trucks had a strong bearing on minimizing the warehousing problem at the Port. That is proper management was the most crucial measure to be taken into consideration. As confirmed by Saxena who shared this view by claiming there should be proper management system to take care of all the stores operations (Saxena, 2003, pp149).

A further inquiry was made to find out other options of solving the warehouse problems, apart from what C.M.C had in place. The responses given were analyzed in table 4.2 below.

Table 4.2 Warehousing Problems Solution aside what C.M.C had in place

Solutions	Number of Responses	Percentage of Responses
Acquiring Standardized Pallets.	5	12.5%
Proper utilization of existing floor space.	14	35%
Increasing the height of stacks in collaboration with Quality Control Division to enable stack accommodate more cocoa beans.	7	17.5%
Expedite disposal of used sack.	4	10%
Recruitment of professionals	3	7.5%
Interference from the Head office should be minimized.	2	5%
Conveyer belts which are white elephants must be disposed off.	5	12.5%

Source: Field data

Respondents were asked solutions to warehousing problems apart from what Cocoa Marketing Company had in place. The results turn out that proper utilization of existing floor space, increasing the height of stacks in collaboration with Quality Control Division to enable stack accommodate more cocoa beans, acquiring standardized pallets, conveyer belts which are white elephants must be disposed off and quick disposal of used sacks, were the must crucial solutions needed to be taken into account in solving the warehousing problems at the Tema Port. This is evidence in the percentage response shown in table 4.2.

4.4 Strategy in ensuring that haulers or transporters offload the cocoa bean as early as possible

Amongst the strategies given were as follows:

- There should be an effective quota system. (That is meeting the quota system per day and violation of it should be punished).
- Adopting FIFO principle.
- Regulating the trucks.
- Introduction of weighbridge to speed up offloading process.
- Building additional warehouses.
- Renting of private warehouses.

The respondents were asked the question as to the effect of warehousing space on Haulers who brought cocoa from up-country. Majority of the respondent said 'yes' the inadequate warehousing space had an adverse effect on the haulers; as a result the trucks are regulated. Explaining its effect on haulers, one WPO officer said, "Sometimes the warehouses become full and so when haulers bring cocoa, we find it difficult to offload the cocoa. As a result it takes the haulers a week or more to do the offloading and this affects their income". However, few of the respondents claim that warehousing space did not have any effect on the haulers. As one WPO officer who worked at Tema Port describe his view:

"There are some pragmatic measures put in place. However, it depends on the efficiency of the operations office, in considering the current available space (Interview, July 13, 2008).

4.5 Are the Warehouses spacious to store the maximum tonnage of cocoa?

Over 90% of the respondents said no, the warehouses were not spacious enough to store the maximum tonnage of cocoa at any given time. But most of them had the perception that with the right attitude and management, the problem will be brought to the barest minimum. Other respondents said with evacuation well planned it can be done. Less than 10% said the warehouses were spacious enough to accommodate the stocks.

The above is supported by Cocoa Marketing Company receipts, shipment and available ware house space at the Tema Port.

Table 4.3 Total Receipts, Shipment and Available Warehouse Space at Tema Port

Crop Year	Total Receipts	Shipment-Tema	Available Space
2003/04	364,584	307,998.50	70,000
2004/05	292,235.125	252,740.25	95,500
2005/06	320,910.75	274,885.0625	110,500
2006/07	282,988.5	199,462.00	120,500
2007/08	319,770.5445	266,170.4375	120,500

Source: W.P.O Department, 2008

The above figures in table 4.3 are in tonnage. These figures give a confirmation that the warehouses at Tema Port have limited available space compared with the receipts of cocoa from the Licensed Buying Companies. It can be seen that the trend of receipts and available space from 2003/2004 crop season to 2007/2008 crop season unravel that there is disparity between warehouse space and the total receipts.

On the same issue of the maximum tonnage of cocoa the warehouses can store given the space, the respondents were asked 'if no', what was done to the remaining tons of cocoa not stored. Majority of the respondents said iterated that the haulage trucks were used as warehouses at no cost to COCOBOD and as such nothing seemed to be done about it. The others also had this to say "The trucks were left at the mercy of the weather till enough space was created". Some said the cocoa are left at the LBC's warehouse, until shipment and evacuation to factories are done by CMC, in order to create space for the remaining cocoa left. (Interview, July 13, 2009).

4.6 Cost of COCOBOD Management due to Inadequate Warehouse Space

One third of the respondents claimed that as a policy, COCOBOD rents private warehouses which are certainly a cost to them.

4.6.1 *Double handling*

The inadequate warehouses indirectly affects COCOBOD, in that when all the warehouses are full whiles no shipment and evacuation is being made, COCOBOD should have re-imburse the LBC's, but they will not get funds to re-imburse these LBC's. COCOBOD does not pay demurrage for using the haulage trucks as warehouses. Perhaps the only cost is the media coverage of the event which impact negatively on its corporate image.

Increase staff numbers.

4.7 How are the LBC's (Licensed Buying Companies) dealing with warehousing Problems at the Tema Port?

The LBC's are renting private warehouses to supplement COCOBOD warehouses. Some of them instead of keeping their trucks waiting to offload the cocoa beans into their rented warehouses until C.M.C is ready to take-over. This enable the trucks go back to the hinterland to bring more cocoa.

Explaining further the Warehousing Operation Manager of CMC posited that, at the moment there are no warehouse problem in terms of space, as more private warehouses have been acquired by the LBC's. Again COCOBOD is currently putting up more warehouses at the Takoradi port which can take 100,000 tonnage/ tonnage capacity of cocoa at a stretch. This when completed would take care of the cocoa beans coming to the Tema port from part of the Western region of Ghana.

4.7.1 Impact of Inadequate Storage Facility on Licensed Buying Companies

Over 80% said inadequate storage facility affected their company. Firstly, this delay of the trucks at the end brings about operational cost. Again since these trucks sometimes serve as warehouses, it affects their turn around time. In addition, they are surcharge for any damage, infestation; lose weight which will lead to re-conditioning at a cost. This was confirmed by one WPO officer who posited that: "CTO's are issued to them to enable them obtain funds for their operations. And once there are inadequate storage facilities they will not have the funds to operate effectively". The rest of the respondents, who said no, argued that due to the regulation system at the Port, Licensed Buying Companies are not affected.

4.8 Limited Space at the Offloading Center and its effect on Management of COCOBOD

The study revealed that the adequate cocoa beans brought from the up-country can not be taken over from the Licensed Buying Companies due to the limited space. As a result some farmers sell the cocoa to non-licensed buyers and also selling across the borders to neighboring countries. Again since the cocoa which have not been taken over are not considered as part of the stock, it affects stock level which eventually affects planning. Cocoa Marketing Company will not get the adequate tonnage to be sold out and also affect planning ahead of time. The image of COCOBOD is affected, since the public view COCOBOD management as inefficient in terms of offloading of trucks.

The number of working days of CMC staff is affected during peak season due to limited warehouse space. There was 100% response rate to this question. Since staff have to work for long hours especially during the peak season and also on weekends and public holidays.

4.9 Policies on Expansion of Warehouse Facilities at the Port

The respondents differed in their knowledge about this topic, since almost 50% said they had no idea on that. However, the other respondent said yes, there were plans put in place to put up more warehouses. But at the moment they were relying on private warehouses.

Again there was 100% response rate to the question, do COCOBOD have in place policies and procedures in checking the stock level, time compression and increasing demand of

customers. Meaning the entire respondents accepted that this policies and procedures are currently adopted by COCOBOD management.

The prevalent practice of record keeping amongst the various warehouses was one of the questions asked. The entire respondent claimed that the practice of records keeping was prevalent amongst all the warehouses at the Port. The respondents were further asked the procedures they followed in keeping their records. Amongst the answers given were as follows:

- The use of ledge, field note books, cocoa taken over receipts and waybills.
- Stack history that is providing adequate information as to the number of bags of cocoa in the cocoa warehouse under storage.
- Arrival records of all the trucks at the warehouses, field reports, stock ledger and evacuation report and CTOR records.
- Record on the number of bags received within a particular shed, discrepant cocoa from the various LBC's, tally sheet affixed to each stack of cocoa and to mention a few.

It is discernible from the analysis that, there are limited warehouse space, handling of cocoa, materials and equipment within the warehouse posed some problems as far as warehouse management was concerned. Again it can be concluded with research findings that the transporters and licensed buying companies were indirectly affected due to these problems earlier mentioned. This situation is not economical in terms of cost minimization as well as shipment of cocoa as far as COCOBOD was concern. However, it can be said that they were keeping good records at these warehouses.

The next chapter would concentrate on the summary, conclusions and recommendations that would be made based on the findings and the researcher's opinion.

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CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Chapter Overview

The chapter contains a summary of the research on assessment of warehousing problems in the cocoa industry at the Tema Port. The study draws conclusion from the findings, and recommendations are made based on the findings and the researcher's opinion.

5.1 Summary of the Study

This dissertation had three main objectives. Firstly, it set out to investigate the effective management of stocked capacity with emphasis on optimization of warehouse space at the Port. Secondly, it was to explore how effective warehouse management should be to improve truck turn-around for offloading and subsequent storage planning. Thirdly, it looks at the procedures and record keeping taking place within the various warehouses or takeover centers at the port.

The topics that were captured in the literature were, the cocoa industry in Ghana, licensed buying companies, warehouse and storage, the role of warehouses, warehouse management system, creating warehouse space, transportation and production cost reduction. Again the study touched on information system of a warehouse management system, cocoa warehousing, records keeping and procedures at Cocoa Marketing Company, and criticism of

warehouses. The purpose of capturing the aforementioned in the literature was in part to aid the researcher in addressing the three set objectives for the study.

The study employed mainly primary data (that is questionnaires and interviews) to unravel how the warehousing problem in the cocoa industry was assessed. The aim was to confirm what was captured in the literature and also what was actually prevailing in the Cocoa industry in Ghana, with emphasis at the Tema Port.

Again in chapter four, attempts were made to analyze the data gathered from the research. This section presents a summary of assessing warehousing problems in the cocoa industry in Ghana with emphasis at the Tema Port.

The main activity at the warehouse was receiving cocoa from Licensed Buyers, storing the cocoa for shipment and evacuation of the cocoa to the local processing companies. However, in most of these warehouses the pallets on which the cocoa beans in bags are packed are in different shapes and sometimes weak and therefore cocoa beans in sacks were not stack to the recommended height.

The study revealed that the poor utilization of existing floor space accounted for the congestion at the warehouses. Thus the space left between stacks to allow for movement during order picking, took much of the space. These unused spaces resulted in the limited number of cocoa bags stored at these warehouses. Added to this was the Licensed Buying Companies non-compliance with the quota system.

It was identified that quick evacuation of the cocoa and the use of bulk storage maximize the usage of space, hence effective utilization of stock capacity at the warehouses.

The study brought to the fore the following issues related to the problems confronting warehouse management of cocoa at the Tema take-over center. These were building of "Kimpling" stacks, not having standardized pallets, congestion during bumper harvest, lack of control over the labourers, short delivery of cocoa, short weight, space taken over by conveyers which were not utilized, inadequate logistics, professional, and unnecessary bureaucracy and lack of initiative, leakages, lack of utility service and poor floor, theft, and lack of water for carriers to take their bath after a long working day.

Interviews with the respondents revealed six strategies to ensure that transporters offload cocoa bean as early as possible: effective quota system, adopting FIFO principle, regulating the trucks, introduction of weighbridge to speed up offloading process, building additional warehouses, and renting of private warehouses.

The inadequate warehousing space had an adverse effect on the haulers, since it took the haulers a week or more to do the offloading which affected their income. The warehouses were not spacious enough to store the maximum tonnage of cocoa at any given time especially during the peak season. With the remaining tons of cocoa not stored the haulage trucks were used as warehouses at no cost to COCOBOD, which affected truck turn around time as well as income of the haulers.

It was evidence that COCOBOD rents private warehouses due to inadequate warehouses which are certainly a cost to them. Another cost was the media coverage of the event of inadequate warehouses, which impacted negatively on its corporate image. Increase staff numbers and double handling was another cost to COCOBOD management.

It was seen that, the LBC's are renting private warehouses to supplement COCOBOD warehouses. Over 80% of the respondents said inadequate storage facility affected their companies. Firstly, this delay of the trucks at the end brings about operational cost. Again since these trucks sometimes serve as warehouses, it affects their turn around time. In addition, they are surcharge for any damage and infestation.

The study revealed that the adequate cocoa beans brought from the up-country can not be taken over from the Licensed Buying Companies due to the limited space. As a result some farmers sell the cocoa to non-licensed buyers and also selling across the borders to neighboring countries. Again since the cocoa which have not been taken over are not considered as part of the stock, it affects stock level which eventually affects planning. Cocoa Marketing Company will not get the adequate tonnage to be sold out and also affect planning ahead of time.

There was research evidence that, there were plans put in place to put up more warehouses. But at the moment they were relying on private warehouses. The study revealed that COCOBOD have in place policies and procedures in checking the stock level, time compression and increasing demand of customers.

The entire respondents claimed that the practice of records keeping was prevalent amongst all the warehouses at the Port.

5.2 CONCLUSIONS

This dissertation set out to map and explain the assessment of warehousing problems in the cocoa industry at the Tema Port. The objective of the researcher in this study was to explore the effective management of stocked capacity with emphasis on optimization of warehouse space at the Port. The study was also set out to find, how effective warehouse management should be to improve truck turn-around for offloading and subsequent storage planning. The study looked at the procedures and record keeping at the various warehouses or takeover centers at the port.

The study employed mainly primary data in the form of questionnaires and interviews, which aid in eliciting information from the various warehouses at the Port. The purpose was to get the views of the various respondents on the assessment of the warehousing problem at the port.

We conclude with research evidence that in most of these warehouses the pallets on which the cocoa beans in bags were packed are weak and these cocoa beans in sacks were not stack to the recommended height. Hence poor utilization of existing floor space (that is the space left between stacks to allow for movement during order picking, took much of the space) which accounted for congestion at these warehouses especially during the peak season.

Cocoa Marketing Company was confronted with myriads of problems in its warehouse management system. It was draw from the findings that, not having standardized pallets, short delivery of cocoa, short weight, space taken over by conveyers which are not utilized, inadequate logistics, leakages, lack of utility service, poor floor and congestion during bumper harvest. Added to these were few professionals, lack of control over labourers, unnecessary bureaucracy, theft, and lack of water for carriers to take their bath after a long working day.

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The inadequate warehousing space had an adverse effect on the haulers, since it took the haulers a week or more to do the offloading which affected their income. The reason was that the maximum tonnage of cocoa did not have enough space to be stored during the peak season, and the remaining tons of cocoa were left in the haulage trucks as warehouses at no cost to COCOBOD, which affected truck turn around time.

The LBC's are renting private warehouses to supplement COCOBOD warehouses. The problem of limited warehousing also affects the incomes of the LBC's.

Over 80% of the respondents said inadequate storage facility affected their company. Firstly, this delay of the trucks at the end brings about operational cost. Secondly the study revealed that the adequate cocoa beans brought from the up-country can not be taken over from the Licensed Buying Companies due to the limited space. As a result some farmers sell the cocoa to non-licensed buyers and also selling across the borders to neighboring countries. Again since the cocoa which have not been taken over are not considered as part of the stock, it affects stock level which eventually affects planning.

The study revealed that COCOBOD have in place policies and procedures in checking the stock level, time compression and increasing demand of customers. The entire respondents claimed that the practice of records keeping was prevalent amongst all the warehouses at the Port. Amongst the records kept were: Arrival records of all the trucks at the warehouses, evacuation report, the use of stock ledger, field report, cocoa taken over receipts (CTOR) and waybills. Stack history (that is providing adequate information as to the number of bags of cocoa in the cocoa warehouse under storage), discrepant cocoa from the various LBC's, tally sheet affixed to each stack of cocoa and to mention a few.

It is clear that warehousing problems if not checked and rectified would adversely affects the profitability of COCOBOD and the Ghanaian economy as a whole, hence maximum effort should be made to tackle the findings (critical factor) aforementioned and to take remedial measures to forestall its reoccurrence. It is believe that the recommendations below to a greater extent will help in addressing the problems.

5.3 RECOMMENDATIONS

There should be quick and timely evacuation of the cocoa to ensure that space is created at the warehouses to accommodate more storage of Cocoa. This could also be effected if shipment were made on time according to strictly planned schedule, since only when loaded containers to be shipped are move for other budge that will indirectly cause a space to be create at these warehouse

Cocoa Marketing Company should employ bulk storage system, in its warehouse operations. It is automated and does help to increase the accuracy of shipment orders and eliminate

related manual handling processes. Hence, the use of bulk storage maximizes the usage of space, hence effective utilization of stock capacity at the warehouse.

COCOBOD should put in place strict supervision in ensuring good stacking and proper management system to take care of the warehousing operation at the Port. COCOBOD should expedite its strategic plan to acquire new machines and equipments for operations at the warehouses.

COCOBOD have to build more warehouses to accommodate the cocoa brought from the up-country, since renting of private warehouses increase the cost of warehousing.

Again the study made it clear that, effective adopting FIFO principle, regulating the trucks, introduction of weighbridge to speed up offloading process at the warehouses were the strategies that will ensure offloading at a faster rate so is recommended that COCOBOD adopt these strategies.

Cocoa Marketing Company needs to strengthen their monitoring and review of the various activities at these warehouses. Thus this review and monitoring should not be a luxury but a necessity for a sound warehousing management to occur at the various take over centers. This will not only help supervisors and Quality Control Division to spot problem or discrepant cocoa on time, but also acts as a continuing check on whether Warehouse and Ports Operation Officers were adhering to the current and best practices of modern warehousing as well as adhering to the policies of Cocoa Marketing Company.

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APPENDIX

QUESTIONNAIRE

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Questionnaire on "Assessment of warehousing Problems in the Cocoa Industry-The Case Study of Tema Port" The aim of the questionnaire is to help in gathering the responses to facilitate a research on assessment of warehousing problems in the cocoa industry as part of the requirement for the award of Executive Master of Business Administration in Institute of Distance Learning, KNUST. Please tick when appropriate and fill in the spaces provided. This research is mainly an academic work, and as such your responses will be treated with utmost confidentiality. Your time and attention spent on these questions would be very much appreciated.

Questionnaire on Assessing Warehousing Problems in the Cocoa Industry at the Tema Port

(1) What type of warehouses do you have at the Tema Take-over center?
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(2) What are the main activities carried out at these warehouses?
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(3) Is competition for warehouse space a major factor accounting for the congestion at the take-over center? Please tick Yes or No.

(4) If yes, what are the reasons accounting for the congestion?
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(5) How do you think the stock capacities of the warehouses are effectively utilized?

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(6) What are some of the measures that have been put in place to minimize the cost of managing the warehouses at the Port?

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(7) What are the major problems that you are facing in managing the warehouses at the Take-over Centre?

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(8) Do these problems occur every year? Yes….. No……

(9) What measures have been put in place to either eliminate or minimize the problems you are facing?

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(10) In your own view what do you think need to be done to solve some of the problems, apart from what C.M.C management had put in place?

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(11) What strategy is your organization taking to ensure that cocoa haulers would offload the cocoa beans or stock as early as possible?

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(12) In your opinion does the warehousing space at the port have an effect on the turnover of haulers who bring the cocoa from the cocoa growing areas?

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(13) Are the warehouses spacious to store the maximum tonnage of cocoa brought to the warehouses for storage and shipment at any point in time.……
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(14) If no, what is done to the remaining tons of cocoa not stored due to inadequate space?

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(12) In your view, how does this inadequate warehouse space affect the management of COCOBOD in terms of cost?

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(13) How is your organization dealing with the warehousing problems at the Tema Port?

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(14) In your opinion, does the inadequate storage facility at the takeover centers affect operations of the licensed buying companies? Please explain.

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(15) How is the limited space in terms of offloading centers affecting the management of COCOBOD?

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(16) Does limited space at the warehouses affect the number of working days of COCOBOD staff during peak season?

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(17) Are there policies put in place in ensuring the expansion of the warehouse facilities at the port?

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(18) Do COCOBOD have in place policies and procedures in checking the stock level, time compression and increasing demand of customer?

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(19) Is the practicing of effective records keeping prevalent amongst the various warehouses or takeover centers at the port? Yes……. No……

(20) If yes, what are the procedures that are followed in the record keeping?

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