IMPROVING WAREHOUSING MANAGEMENT OF COCOA AT THE PORT OF TEMAN

BY

DZIGBORDI EVELYN BOKOR
(10060503)

A THESIS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON
IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF A DEGREE IN MA PORTS AND SHIPPING ADMINISTRATION

JANUARY, 2012
DECLARATION

I Dzigbordi Evelyn Bokor (10060503) hereby declare that this project is my original work undertaken under the supervision of Dr. Kwadjo Kwabia and Capt. (Mrs) Catherine Haizel and has never been submitted to any academic institution for examination. All references cited have been duly acknowledged.

Signature .......................................................... Date 27/12/12

Dzigbordi Evelyn Bokor
(Student)

Signature .......................................................... Date 24/02/12

Dr. K. Kwabia
(Supervisor)

Signature .......................................................... Date 2nd March 2012

Capt (Mrs.) Catherine Haizel
(Supervisor)
ABSTRACT

The cocoa industry in Ghana serves both the local industry and the international communities through export of the locally produced cocoa beans. Recently the various warehouses at the Take Over Centres are noted for congestion and inefficiency resulting in revenue loss and operational setbacks.

This study was undertaken with the main objective of improving warehouse management of cocoa at the port of Tema. It specially identifies the causes of congestion and its impact on operations, as well as the state of equipment at the warehouses.

Information was solicited from staff of Tema Take Over Centres and Licensed Buying Companies through structured questionnaire design which was administered in person.

A significant finding from the study was that, the existing cocoa warehouses are highly inadequate and the available spaces are not effectively utilized due to lack of requisite modern equipments, lack of staff development and lack of adherence to internal controls. Again, waiting time of Licensed Buying Companies at the Take Over Centres warehouse is very long and beyond expectation with associated high cost to both group of companies.

In the wake of increasing cocoa production it is necessary to mechanize and automate the operations of the warehouses. Cocoa Marketing Company (CMC) should undertake a training needs assessment and recommend an appropriate training programme for all staff.
DEDICATION

This work is dedicated to the memory of my late father Mr Japhet Freeman
Kwodzo Anku. Daddy, rest in perfect peace.
ACKNOWLEDGEMENT

In acknowledging the generosity of others and their contribution to this work, I begin with Mr. Charles Kofi Kukah. Kofi, for your thoughtfulness, time and encouragement I appreciate so much.

To my supervisors, Dr, Kwodzo Kwobia and Capt (Mrs) Cathrine Haizel, I am grateful for your cooperation, motivation, and guidance.

To Derrick and Bananas I appreciate your help in the collection of data.

May I take this opportunity to express my sincere gratitude and appreciation to my family, Seyram, Selikem, and Selorm for their support and encouragement.

To crown it, I say thank you God for good health, safe driving to campus and back every day, above all excelling in my academic work.
# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMB</td>
<td>COCOA MARKETING BOARD</td>
</tr>
<tr>
<td>CMC</td>
<td>COCOA MARKETING COMPANY</td>
</tr>
<tr>
<td>COCOBOD</td>
<td>GHANA COCOA BOARD</td>
</tr>
<tr>
<td>CTOR</td>
<td>COCOA TAKING OVER RECEIPT</td>
</tr>
<tr>
<td>FOB</td>
<td>FREE ON-BOARD</td>
</tr>
<tr>
<td>LBC</td>
<td>LICENSED BUYING COMPANY</td>
</tr>
<tr>
<td>PBC</td>
<td>PRODUCE BUYING COMPANY</td>
</tr>
<tr>
<td>PPRC</td>
<td>PRODUCER PRICE REVIEW COMMITTEE</td>
</tr>
<tr>
<td>QCC</td>
<td>QUALITY CONTROL COMPANY LIMITED</td>
</tr>
<tr>
<td>TOCS</td>
<td>TAKE OVER CENTRES</td>
</tr>
<tr>
<td>WPO</td>
<td>WAREHOUSE AND PORT OPERATION DEPT</td>
</tr>
</tbody>
</table>
TABLE OF CONTENTS

CONTENT .................................................................................................................. iii

DECLARATION ........................................................................................................... ii

ABSTRACT ............................................................................................................... iii

DEDICATION ........................................................................................................... iv

ACKNOWLEDGEMENT .............................................................................................. v

ABBREVIATIONS ...................................................................................................... vi

LIST OF TABLES ....................................................................................................... xi

LIST OF FIGURES .................................................................................................... xii

CHAPTER ONE .......................................................................................................... 1

INTRODUCTION ........................................................................................................ 1

1.1 Background to the study ................................................................................... 1

1.2. Problem Statement ............................................................................................ 3

1.3 Research Objectives .......................................................................................... 3

1.4 Research Questions ............................................................................................ 4

1.5 Significance of Research ................................................................................... 4

1.6 Scope of the study ............................................................................................... 5

1.7 Limitation of the study ....................................................................................... 5

1.8 Organization of the study .................................................................................. 5
CHAPTER TWO ......................................................................................... 7

LITERATURE REVIEW ................................................................................ 7

2.1 Introduction .......................................................................................... 7

2.2 Overview of the Ghanaian Cocoa Sector .............................................. 7

2.3 Cocoa Sector Reforms .......................................................................... 9

2.4 Cocoa Sector Strategy ........................................................................... 10

2.5 Concept of Warehouse Management .................................................. 12

2.6 Performance Measurement of Warehouse Management .................... 15

2.6.1 Labour hours utilization ................................................................. 17

2.6.2 Warehouse area utilization .............................................................. 17

2.6.3 Cost performance ........................................................................... 17

2.6.4 Productivity measures .................................................................... 18

2.7 Concept of Supply Chain Management (SCM) in relation to the Cocoa sector.. 19

2.7.1 Cocoa Beans Production by Smallholder Farmers ............................ 21

2.7.2 Collection and Bagging – LBCs ....................................................... 22

2.7.3 Quality Assurance - COCOBOD .................................................... 24

2.7.4 Warehousing and Other Logistics (Private & COCOBOD) ................. 26

2.8 Current State of the TOC Warehouse .................................................. 26

2.9 Literature Summary .......................................................................... 29
a. Staff and training: ................................................................. 52
b. Performance Appraisal .......................................................... 53
c. Internal controls ................................................................. 54
d. Working Tools/ Equipments ................................................... 55
e. Space utilization ................................................................. 56
f. Overall efficiency .............................................................. 56

4.4 Responses from LBCs .......................................................... 57

CHAPTER FIVE ........................................................................ 60

SUMMARY, CONCLUSION AND RECOMMENDATIONS ............... 60

5.1 Introduction ........................................................................ 60

5.2 Summary of Findings and Discussion ..................................... 60

5.3 Challenges of Cocoa warehousing at the Tema TOC .................. 62

5.4 Conclusions ....................................................................... 64

5.5 Recommendations ................................................................ 65

REFERENCES .......................................................................... 67

APPENDIX A: QUESTIONNAIRE FOR TAKE OVER CENTRES ........ 70

APPENDIX B: QUESTIONNAIRE FOR LBCs ................................. 75
LIST OF TABLES

Table 4.1: Age Distribution of Staff at the TOC
Table 4.2: Educational Level of Senior and Junior staff of Tema TOC
Table 4.3: Descriptive Statistics on years of working at the Tema TOC
Table 4.4: Views of respondents on waiting time of LBC at the Warehouse
Table 4.5: Cross-tabulation of Position status and response to whether waiting time is beyond expectation at the beginning of the season
Table 4.6: Chi-Square Tests
Table 4.7: Association between Years of Service and Employee Perception about LBC Waiting Time
Table 4.8: Summary of responses to Issues of Staffing and Training needs
Table 4.9: Summary of Responses to Issues of Appraisal and Supervision
Table 4.10: Summary of Responses to Issues of working tools/Equipment
LIST OF FIGURES

Figure 2.1: Value Chain Processes in the Cocoa Sector

Figure 4.1: Age Distribution of Senior and Junior staff of Tema TOC

Figure 4.2: Educational Background of respondents from Tema TOC

Figure 4.3: Waiting time of LBCs at the Warehouse of Tema TOC

Figure 4.4: Percentage Distribution of responses as to whether LBC waiting time is beyond expectation

Figure 4.5: Cross-tabulation of Position status and response to whether waiting time is beyond expectation at the middle of the season

Figure 4.6: Summary of Responses to Issues of Internal controls and Adherence

Figure 4.7: Summary of Responses to Issues of Space and its Utilization

Figure 4.8: Assessment of the overall efficiency of warehouse management at Tema TOC
CHAPTER ONE
INTRODUCTION

1.1 Background to the study

The cocoa industry plays a significant role in the Ghanaian economy; contributing to about 28% of the national agricultural GDP. The industry has expanded with cocoa production increasing from over 280,000 metric tonnes on average in the early 1990s to over 730,000 metric tonnes in 2004/2005. Its production since then has remained at 950,000 metric tonnes at the end of 2011. The Cocoa Marketing Company (CMC) anticipates production beyond 1,000,000 metric tonnes by 2013; an indication of increasing burden on storage and marketing facilities of cocoa with associated decline in quality and service delivery.

The industry serves both the local industry and the international communities through export of the locally produced cocoa beans. Over the years, Ghana has been one of the few countries recognized all over the world to have consistently produced high quality cocoa beans. The high quality of Ghana cocoa has contributed to the premium price it attracts in the international market.

The marketing chain process of the industry is commenced by farmers producing the cocoa beans in the various hinterlands. Licensed Buying Companies (LBCs) then buy the beans from the farmers and bring them to designated Take over Centres (TOCs) under Cocoa Marketing Company (CMC) for export and for sale to local cocoa processing factories and products manufacturers. At each TOC are a number of warehouses for storage of the cocoa beans. The Warehouse and Ports Operations department (WPO) is
responsible for the receipt, storage and management of cocoa at the three (3) TOCs in the country. These centres largely act as the intermediary between the upstream and the downstream of parties in the industry and also ensure regular availability of Ghanaian cocoa in the market.

In recent times, there has been a lot of concern for effective warehousing operations management in the wake of the expansion in production level of cocoa in Ghana. The effectiveness of the cocoa warehouse is seen as the life force of the back office operations of the organization and contributes largely to the overall productivity of the cocoa industry. Most often than not, the challenge has been attributed to scarcity of space in the warehouses. However, this predicament can largely be addressed and redressed by proper planning in terms of the warehouse space and layout of the inventories. In this regard, space planning in the warehouse must be given high priority in warehouse management.

Therefore, the use of state of the art technologies, and regular assessment of the performance of the warehouse to ensure continuous improvement is important. In this regard, a review of the flow of its operations from the receipt of cocoa beans to the delivery end of local and international companies must be structured against a set of key performance indicators.

The recent calling for increase in the number of warehouses (space) by the Ghana Cocoa Board should be ascertained by assessment of the level of optimization of the available space.
1.2. Problem Statement

The Ghana Cocoa Board in recent times has to grapple with congestion of “Cocoa laden trucks” waiting to off-load cocoa beans from the hinterlands. The congestion is known to have negative impact on the quality and quantity of the cocoa beans. The operational inefficiencies of LBCs and TOCs result in heavy revenue loss. This situation has been associated with lack of adequate warehouses to immediately off-load the cocoa bags. Government and other stakeholders are therefore being called upon to establish more warehouses. However, little or no effort has been made to re-examine if there is effective utilization of the existing warehouse space. The proposal for establishment of more warehouses is merely based on the phenomenon of seeing congestion at the takeover centers. Therefore, a research into the management of the warehouse is necessary and this is the focus of this study.

1.3 Research Objectives

Primarily, the research aimed to identify how Cocoa warehouses in Ghana can be properly utilized to ease congestion at the TOC at the Port of Tema. The specific objectives are;

1. Identifying the causes of congestion at the warehouse at TOC, its impact and how effectively it can best be minimized.

2. Assessing the state of facilities/equipment and their effectiveness at the warehouse of TOC.

3. Identifying the challenges facing warehousing of cocoa in Ghana and how they can be resolved
4. Identifying current measures being taken by Cocoa Marketing Company to improve storage capacity and quality of cocoa beans.

1.4 Research Questions

The study intends to address the following questions:

1. What is the average duration LBC’s spend at the takeover center before they are off loaded?
2. What are the main causes of the congestion at the TOC?
3. What is the state of equipment use at the warehouse of the takeover center
4. What measures are being taken by Cocoa Marketing Company to improve storage capacity and quality of cocoa beans?

1.5 Significance of Research

1. The study provides some suggestions towards achieving the main objective of COCOBOD which states “Secure the most favorable arrangements for the purchase, grading and sealing, certification, sale and export of cocoa”.
2. The study identifies the challenges of the operations of cocoa warehousing at the Tema TOC and outline appropriate recommendations which when implemented could lead to efficiency in cocoa warehouse management at the TOC. The report contributes to the assessment of efficient use of warehouse (space), thereby forming the basis for decision making as to whether to expand or increase the number of warehousing facilities in the storage of Cocoa and if so by how much.
3. For academic purposes, the study will serve as literature for further research by students, consultants, teachers and others who are interested in the study of similar topics.
1.6 Scope of the study

The study focuses on Senior and Junior staff of the Tema takeover centers, representatives of LBCs and some shipping companies. These are parties that have deeper understanding of the daily operations of the WPO department, issues of storage of cocoa and company effort towards improving storage facilities. The scope was limited to only the Tema take over centre because of time and resource constraints on the research.

1.7 Limitation of the study

The study was limited to only warehousing management of Cocoa storage and hence adoption of the recommendations in a different product may not be appropriate. This is because the supply chain process and manner of distribution of Cocoa in the country vary from other products. There were also resource constraints (time and finances). There are three designated Take Over Centres in the country, namely, Tema, Takoradi and Kumasi. However, due to these constraints, the study was limited to only the Tema Take Over Centre.

1.8 Organization of the study

The study is divided into five major chapter areas:

Chapter one deals with the introduction of the work; giving a brief background to the study, the problem statement objectives of the study, the significance of the scope and limitations in the study.

Chapter two gives a review of existing research works and documents in the area of Cocoa production and storage in Ghana, Warehouse management, and best practices.
Chapter Three covers, the research methodology which includes methods of data collection, sample size requirement, target population, the sampling procedure applied and the statistical tools used in the analysis.

Chapter Four presents the analysis and interpretation of the information collected from the field. This was done using statistical software, called SPSS (Statistical Package for Social Sciences) and Office excel.

Chapter Five presents the findings, conclusions and recommendations from the study.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

Information in this chapter of the report gives an in-depth overview of the operations of the Ghanaian cocoa sector. It examines the structures of stakeholders and their contribution to the efficient operation of the sector. Attention is given to the cocoa warehousing structures, current state, and the plans of government to ensure efficiency of the sector.

2.2 Overview of the Ghanaian Cocoa Sector

The cocoa sector is of vital importance to Ghana, employing millions of people and contributing important revenue to the government. The industry was dominated by private international manufacturing and processing companies until the end of World War II when the colonial government established the Cocoa Marketing Board (CMB) in 1947 as a medium to gain a bargaining power in dealing with international companies and purchasing of cocoa. The producer price was determined by the world market price and a tax, but the system was eventually abandoned in favour of a marketing board system with fixed nominal producer prices that granted the CMB high shares of the world market price (Leith & Soderling, 2003). The CMB was given sole responsibility of exporting cocoa through its wholly-owned subsidiary the Cocoa Marketing Company (CMC). The sector adopted a multiple buying system where several licensed buying companies (LBCs) operated on the internal market as buying and transportation
companies for the CMB. (Ministry of Manpower, Youth and Employment, 2008). In 1966, a state-owned buying company was established; the Produce Buying Company (PBC) to operate alongside the private-owned buying companies. In 1977, the multiple buying system was abandoned and the PBC became the only buying company operating in the internal market; a system described as monopsony. (Ministry of Manpower, Youth and Employment, 2008)

Prior to independence, the world market price of cocoa was high, enabling the CMB to pay farmers relatively high producer prices. As a result, the country’s capacity for growing cocoa increased substantially; from 1950 to 1960 production of cocoa doubled. Due to Ghana’s large share of world cocoa exports (it averaged around 30 percent of the world market between 1911 and 1978) the increase in production depressed world market prices (demand being lower than products availability). This price decrease affected farmers negatively and even more so as a result of the use of fixed nominal producer prices and high domestic inflation. The negative impact of decreasing prices on production became apparent in the middle of the 1960s and was invigorated by increased smuggling of cocoa to Côte d’Ivoire, which offered farmers higher producer prices. (Leith & Söderling, 2003).

The nation’s economy worsened quickly due to political instability, lack of facilities maintenance, and severe drought in the beginning of the 1980’s resulted in bush fires destroying huge cocoa growing areas (Leith & Söderling, 2003). Total cocoa output declined steadily between the late 1960s and middle 1980s. Low producer prices led farmers to shift to more profitable crops. Cocoa farmers were mainly of old age and illiterates which obstructed adoption of new technology and disease and pest controls.
The lack of credit for cocoa farmers led to a lack of good planting materials for rehabilitation of old farms. The low income levels of cocoa farmers and the bush fires caused production in the beginning of the 1980s to drop to levels comparable with those in the 1930s. (Ministry of Manpower, Youth and Employment, 2008)

2.3 Cocoa Sector Reforms

Information reviewed under this section highlight the major plans that have been undertaken over the years towards enhancing operations in the cocoa sector. These reforms are mostly aimed at raising prices received by producers and increasing overall performance of the cocoa sector.

The first phase of the reform was initiated in 1984/85 and focused on restructuring the Cocoa Marketing Board (CMB). The CMB was more streamlined by a reduction of the number of staff from around 100,000 employees to 6000 and by a cut-down on overlaps in the organisation. The many operational and institutional changes of the CMB led to it changing its name to Ghana Cocoa Board (COCOBOD) (Ministry of Manpower, Youth and Employment, 2008). During this initial phase attempts were also made to restructure production by providing farmers with hybrid seedlings to replace old trees, promoting transport and sales by constructing and upgrading roads and putting greater emphasis on extension services and the use of fertilisers and pesticides in production (van Duursen & Norde, 2003).

The second phase, which was implemented in 1993, consisted of a re-introduction of the multiple buying system. Prior to the reform, the structure of the cocoa sector was characterized by complete monopoly. The market was in the hands of the
government which through the CMB was the only authorized domestic buyer and exporter of cocoa. The CMB carried out its activities through its subsidiaries the PBC and the CMC. In addition, its subsidiary the Quality Control Division (QCD) was responsible for controlling the cocoa quality (Laven, 2005). However, by the multiple buying system, private LBCs are once again allowed to operate on the domestic market together with the PBC (Varangis & Schreiber, 2001). The objective of the liberalisation reform was to introduce competition on the internal market and improve the chain with regard to its operational and financial performance as well as open up for the possibility of paying higher competitive producer prices (Laven, 2005).

More recent reforms, aiming at further increasing the efficiency of the cocoa sector, were implemented in 1999 in the government’s Cocoa Strategy. These reforms involved reducing marketing costs and taxes of COCOBOD further and targeting the producer price to 70 percent of the world market price by crop year 2004/05 (Ministry of Manpower, Youth and Employment, 2008). Conclusively, the reform to a large extent has enhanced cocoa production in the country. However, there was no corresponding improvement in the warehousing system; a setback in the cocoa reform.

2.4 Cocoa Sector Strategy

Beside the reform, key strategies have been formulated to further enhance the performance of the industry. The cocoa sector since the year 2000, has witnessed two major strategies. The first (1st) cocoa sector strategy was implemented over a 10-year period from 1999/2000 to 2009/2010. The main elements of that strategy were:

- To increase cocoa production to 700,000 tonnes and sustain it;
• To increase the producer price to 70% of the FOB price;
• To reduce the cocoa export tax to 15%
• To ensure effective competition in the internal cocoa marketing; and
• To allow qualified buying companies to export up to 30% of their purchase.

Existing information indicate that most of these strategies have been achieved; Cocoa production increased steadily from 397,700 metric tonnes in the year of the plan (1999) to 736,600 metric tonnes in 2003/4. Output has been high but not consistently above the 700,000 tonne-mark as planned. COCOBOD through the Producer Price Review Committee (PPRC) determines the minimum producer price for cocoa. The pan-territorial producer price is a floor price and the LBCs are permitted to offer higher prices as they compete to buy. In line with the strategy, the price has not been lower than 70% of the FOB price since 2004/5 cocoa season. Additionally, the continual adoption of the multiple buying system in the internal marketing of cocoa has ensured significant competition in the purchase of cocoa beans with about 26 LBCs operating. Asante (2011)

The second (2nd) Cocoa Sector strategy covers all the major areas of the cocoa industry namely; production, research, cocoa extension, input supply and services, financing, internal and external marketing, quality maintenance, domestic processing, crop pricing, taxation, cocoa infrastructural development, child labour and the likely impact of the emerging oil sector on the cocoa production. The key strategies are:

• To achieve a 10% annual growth rate of cocoa production year on year
• To achieve production of 1,000,000 metric tonnes by 2012/2013 season
• To increase productivity from the current 450kg per hectare to 1000kg per hectare by 2018/19
• To sustain the high quality of Ghana cocoa which contributes to the premium price it attracts;
• To construct new warehouses to meet the warehouse needs of the company; and
• To separate the function of WPO from CMC to enable the CMC to concentrate on its core function of external marketing and shipping. Asante (2011)

Reference from the literature above also confirms that, little or no long term plans are underway to streamline cocoa warehousing in the country.

2.5 Concept of Warehouse Management

Warehousing management is important to ensure a balance between production and demand. 'The warehouse is a point in the logistics system where a firm stores or holds raw materials, semi-finished goods, or finished goods for varying periods of time.' (Coyle et al, 2003). Warehousing minimizes the effects of supply chain inefficiencies, improves logistics accuracy and inventory management, and allows product accumulation, consolidation, and customization. The cost of warehousing should be commensurate with the contribution of warehousing to overall logistics performance - typically between 2% and 5% of corporate revenue. In world-class warehousing these costs are minimized while improving customer service. (Frazelle et al, 2003) Generally, all warehouse perform the same basic function; receiving, storing, picking, and shipping. The primary objective of a warehouse is to maximize the effective use of resources while satisfying customer requirements. According to Kulwiec (2007) all warehouses have three scarce resources;

 i. Space
ii. Equipment, and

iii. People

The customers of a warehouse have two basis demands;

i. That the right product be available at the right place at the right time and

ii. The product be received in a condition usable by the customer.

Based on these resources and customer requirements, the primary objectives of a warehouse are more clearly defined to be;

1. Maximize the effective use of warehouse space
2. Maximize the effective use of warehouse equipment
3. Maximize the effective use of warehouse labor
4. Maximize the accessibility of all goods
5. Maximize the protection of all items.

A study by Ackerman (1997) identified three key components of warehousing as a requirement for a satisfactory warehouse. These are space, equipment and people. The study concluded that, warehouse management personnel cannot improve their distribution of products performance without understanding the correlation between the components.

Space: "Warehouse space is a commodity. Like any commodity, its price can show great volatility with changes in demand" (Ackerman, 1997). Acquisition of additional space might nearly prove impossible when commodity cost is higher or it is designed for limited space storage. At the same time, people and equipment can be used to avoid the high cost of space. Wasted space is more costly than wasted manpower because space is used all of the time, 24 hours a day and 365 days a year, which is more capital investment (Frey, 1983). Similarly, warehouses must also provide rapid, easy movement of products.
from storage to the shipping area and this movement will occupy more space for handling and storage of products. Therefore, it needs to perfectly determine proper planning of required space which reduces operating cost and also eliminates the wasted space. The purpose of a warehouse is to keep all stored products in good condition using a minimum amount of space. A minimum amount of space needs to be planned in a careful design so that the inventories can be protected any time by warehouse operators. Space should be measured in cubic feet of storage occupancy (Frey, 1983). Proper calculation of storage space contributes to good utilization and will not result in space shortages. Many factors should be considered when calculating space requirements and warehouse management should identify the cube loss factors to increase the net cube capacity utilization.

Thus, utilization of warehouse space is the ultimate role in warehouse layout management. The good utilization of space should begin with good warehouse visibility. Baudin (2004) indicated that warehouse visibility includes: labels on the grid of columns which are supporting the ceiling, dock numbers that remain visible when docks are open, three-sided overhead zone identification signs, aisle/column/level labels on each slot in a pallet rack.

*Equipment:* Equipment is defined as materials handling devices used to make a warehouse function, such as racks, conveyors, and all of the hardware and software (Ackerman, 1997). Using specially designed equipment can save warehouse space, but using large amounts of equipments can also increase the numbers of labor. Large amounts of equipment should be considered according to their necessity and space conditions, such as if the space has low ceilings, or when an unusual environment exists.
Overall productivity is affected by the amount and the type of equipment used (Frey, 1983). If the required type or amount of equipment is not on hand to balance between a high cube warehouse and a multi-million dollar inventory, then it could barely meet the system demands. Use of equipment should fit and suit warehouse nature.

*People:* People are the most critical component in warehousing (Ackerman, 1997). Perfect utilization of space and equipment operated by workers makes the difference between high and low quality warehousing. The cost of labor since World War II has not escalated as rapidly as the cost of new space therefore productivity studies showed that most warehouses emphasize the better use of people.

### 2.6 Performance Measurement of Warehouse Management

Assessment of warehouse productivity involves a number of measurements that management can analyze to monitor the performance of their warehouse operations. There are a number of reasons why organization must measure performance and productivity within their warehouse. This is done to:

- Ensure customer satisfaction;
- Ensure that there is a culture of continuous improvement with the operations;
- Discover potential issues before they become major problems; train staff in the right areas.

According to Ackerman (1997), four areas are measured within the warehouse:

- Reliability
- Flexibility
- Cost
• Asset utilization

In a similar study, Slack et al (2001) offer the following description of high performance operations that most companies strive to accomplish:

• High-quality operations don’t waste time or effort having to redo things, nor are their internal customers inconvenienced by flawed service,

• Fast operations ensure a quick turnaround of orders

• Dependable operations can be relied on to deliver exactly as planned. This eliminates wasteful disruption and allows the other micro operations to operate efficiently.

• Flexible operations adapt to changing circumstances quickly to avoid disrupting the rest of the operation.

• Low-cost operations lead to higher profits as well as allowing the company to sell their products at a competitive price.

This reveals the existence of a number of inputs and resources that can be used to measure warehouse productivity. They are grouped mainly into

• Labour hours and warehouse utilization

• Cost

• Productivity
2.6.1 Labour hours utilization

This measurement looks at the utilization of labour hours within the warehouse based on the total number of labour hours available to work over a particular shift, day or even week and calculated as,

\[(\text{Labour hours used} \times 100) / \text{labour hours available}\]

2.6.2 Warehouse area utilization

This is done by measuring the cubic capacity of the warehouse. Alternatively, the number of pallet locations utilized against the total possible locations can be measured. The calculation is: \[(\text{Space used} \times 100) / \text{Space available}\]; where the space used is the space specifically earmarked for storage. Although improving space utilization is an important goal for any warehouse, the key to improving overall warehouse productivity, that is space and labour, is to find the best compromise between storage utilization and handling efficiency.

2.6.3 Cost performance

These measures include cost as percentage of sales and cost per order dispatched. The calculation is as shown below:

Cost as a percentage of sales: \[(\text{Total warehouse cost} \times 100) / \text{total sales volume}\]

Cost per order dispatched: \[(\text{Total warehouse cost/total number of orders shipped})\]. In using this measure, caution is given that dispatch of cheaper products from the warehouse can result in a higher cost per order, which is not a reflection of increased costs in the warehouse but a strategic decision made by the company.
2.6.4 Productivity measures

Units picked per hour: Units picked/total hours available

The unit in this context can be an individual item, a carton or a pallet.

Dock-to-stock time: This is the time taken from arrival of vehicle on the receiving bay to visibility of stock on the system

The final group is based on customer service measures:

Order Accuracy: (Order picked and dispatched accurately x100)/ total orders received

On-time shipments: Orders delivered as per customers’ requests /total orders received

Whereas a number of studies confirm the performance measures above, there is a word of caution that each company has different priorities, a different customer base and a different method of operation. Hence, in order to choose the most appropriate measure (KPI), one needs to undertake the following:

- Understand the organization’s business and strategy
- Decide on the objectives and set realistic targets
- Understand which KPIs are likely to assist in meeting the objectives
- Align the KPIs to others within the company
- Ensure that everyone works towards achieving the targets

Faber et al. (2002) examine information systems for warehouse management. In their exploratory study they examine complexity of warehouses and control structure. Complexity of warehouse management is indicated among others by amount and heterogeneity of handled products, the extent of overlap between them, amount and type of technology as well as characteristics of associated processes. Their findings suggest
that warehouses with a high daily amount of processed order lines and amount of stock keeping units will be best supported by customized software.

In a similar study, Rogers et al. (1996) examined whether the use of information technology affects performance of warehouses. They conducted a survey including both public and dedicated warehouses. Their findings suggest that the use of information technology is related to several positive outcomes, such as improvement of quality, cycle times might be reduced as well as an increase in productivity.

2.7 Concept of Supply Chain Management (SCM) in relation to the Cocoa sector

This section of the literature examines the various stages of the cocoa production and processing in Ghana and tends to identify where there are lapses. The basic concept of supply chain management is adopted and applied in this regard.

A review of existing studies gives a comprehensive overview of supply chain management and its importance in enhancing organizational efficiency. Citing a few of them, Chopra and Meindl, (2001) defines supply chain management as a set of approaches utilized to effectively integrate suppliers, manufacturers, logistics, and customers for improving the long-term performance of the individual companies and the supply chain as a whole. Supply chain management includes the link between upstream (such as supply and manufacturing), and downstream (such as logistics and distribution) value chain entities. Successful supply chain management requires the integration of these value chain entities to create cooperative and collaborative environments that facilitate information exchanges, materials and cash flows. Ling (2007) also explained that, the Supply Chain encompasses all activities in fulfilling customer demands. These
activities are associated with the flow and transformation of goods from the raw material stage, through to the end user, as well as the associated information and financing. Ling categorizes the supply chain into four stages:

- The supplier network- consists of all organizations that provide materials or services, either directly or indirectly.
- the internal supply chain which are manufacturing plants,
- Distribution networks- responsible for the actual movement of materials between locations. It involves the management of packaging, storing and handling of materials at receiving docks, warehouses, and retail outlets
- The end users.

Moving up and down the stages are the four flows: material flow, service flow, information flow and funds flow. Deductively, the application of the concept of supply chain management in any field is to ensure efficiency and effectiveness in organizational products or service delivery.

In Ghana, the cocoa sector consists of a chain of economic activities related to production, transportation, quality control and marketing of cocoa. The main players in the chain processes are farmers, LBCs, COCOBOD, and exporters and local processing Companies. In addition, various government and business groups providing extensions and inputs to farmers as well as bank and credit facilitators are important actors on the market. At every stage of the chain process, there is some amount of value added to the cocoa beans. The Chain process is as shown in figure 2.1
2.7.1 Cocoa Beans Production by Smallholder Farmers

At the beginning of the chain process is the production of cocoa by smallholder farmers. These are mainly small scale farmers owning less than 5 hectares of cocoa land. According to Statistics from COCOBOD (2009), van Duursen and Norde (2003) and Bartholdson and Valentin (2006), the number of smallholders is approximately one million, whereas the overall number of workers in the cocoa sector is around 3.2 million.
This is about 14 percent of the Ghanaian population (compared to Ghana’s population of 24 million as indicated by the 2010 Population Census). Though the 3.2 million figure may be small compared to the current population, it is twice the number of workers in the cocoa sector as per the records of 1997. The farmers operate in 67 cocoa producing districts, in six of the ten administrative regions in Ghana. The cocoa producing regions are located in the southern part of the country (COCOBOD guidelines, 2009).

2.7.2 Collection and Bagging – LBCs

The Farmers and the LBCs are in the upstream or supplier networks of the chain process. The Farmers transport and sell their harvest to the LBCs located at approximately 2700 selling points across the country’s cocoa producing regions. In regions where the volume of cocoa production is low, the only operating LBC is the PBC, the former subsidiary of COCOBOD. Hence there is at least one outlet where farmers can sell cocoa in all cocoa growing areas.

The reform of the cocoa sector through privatization of the buying companies to bring about liberalization of the internal market (i.e. more LBCs to buy instead of only the state-owned PBC) has brought about competition in the sector. Currently, there are 26 LBCs operating in Ghana. Prospective buyers initially apply to the COCOBOD for consideration to be licensed as buyers. They are expected to buy a minimum of 2000 metric tonnes of cocoa per crop season at a minimum producer price set by a Producer Price Review Committee (PPRC). The LBCs are paid by COCOBOD according to margins set by the PPRC. In their operations, they are required to abide by the regulations and guidelines set out by COCOBOD. Existing literature indicate that, there are a number
of challenges confronting the LBCs. The Ghana Cocoa Farmers Survey (GCFS) data between 2001/02 and 2003/04 and studies by Zeitlin et al (2006) concludes that, the margins paid by government for cocoa delivery do not allow for easy operations in the purchasing market. According to Vigneri and Santos (2007), margins paid to traders as fixed by the government in Ghana in noted to be one of the lowest in the sub region. The fixed pricing regime forces LBCs to compete in volumes which have resulted in increased speed with which cocoa is being transported from growing areas to take over centers. Thus, LBCs have prioritized on efficiency of their capital turnover. Again, there is the adoption of many non-price strategies such as investing directly in farmers and providing them with prompt payment, bonuses, gifts, subsidized inputs credit and training as well as maintaining durable social relations with their suppliers. This has resultanty increased production and purchasing but the increasing number of LBCs reduces each market share which finally affect the margins. According to Varangis and Schreiber (2001), the capacity of the COCOBOD warehousing system and that of the LBCs has not responded to buyers increased speed of turnover. This results in congestions at the ports especially during the peak season (October, November and December) leading to large sums of funds being locked up in stocks at the ports. In most cases, loaded trucks wait for more than 30 days to be off-loaded. This was evident in a recent market report where the president of the Licensed Buyer's Association (LICOBAG) was quoted as saying that delays at the ports have made it almost impossible for LBC's to break even in recent seasons (African Echo News, 2006). After buying the cocoa from the farmers in the hinterlands, the LBCs invite the Quality Control Company, a subsidiary of COCOBOD to grade and seal the cocoa at a fee which is also determined by the PPRC. The bags of
cocoa are then handed over to CMC at designated Take Over Centers for export or for sale to the local cocoa manufacturers.

2.7.3 Quality Assurance - COCOBOD

The international cocoa trade is governed by a set of regulations which include quality standards. The quality parameters include:

- Unacceptable moisture content
- mouldiness
- slatiness
- germinated beans
- flat or broken beans
- insect-damaged beans

The cocoa is graded as;

1. Grade I
2. Grade II or
3. Substandard (SS)

The Quality Control Company (QCC), a subsidiary of COCOBOD is responsible for ensuring that high quality of cocoa beans is maintained through a strict grading system.

The quality control process involves the following;

a. The product is checked, graded and issued with Evacuation Certificate at the LBC districts depots before it arrives at the TOCs. The process continues at the TOCs to confirm the grading and other specifications on the Evacuation Certificate as
well as check for in-transit discrepancies such as rain-drenched bags, burst bags, oil/lubricant soaked bags arising from possible accidents, among others.

b. All bags are checked using the Acqua Bouy and the Probe Electrode to establish the appropriate moisture content of the load before it is off-loaded. Bags that fail the test are not sampled. Any product beyond moisture content of 7.5% is rejected. The moisture content of the “passed bags” is confirmed with the Cup Electrode.

c. To establish the category, 0.02kg is “horned” from each bag and bulked together. Using the Coco-scale (bean scale), the cocoa beans are weighted and counted. The tolerance level is established using the sieve to take out unusual beans. Sample below 10% is classified as having passed the tolerance level.

d. The beans are cut open to expose defects which are internal and cannot be seen by the eye from the outside such as slatiness, mouldiness, and purple colour. For beans to qualify as Grade I, the sample must obtain (3-3-3 rating) as the rating:

i. Mouldiness of the sampled cocoa beans should not exceed 3%

ii. Slatiness should not exceed 3%

iii. All other Defects (AOD) should not exceed 3%

iv. Purple colour must not exceed 20%

Similarly, Grade II is rated 4-6-8 as follows;

i. Mouldiness of the sampled cocoa beans should not exceed 4%

ii. Slatiness should not exceed 6%

iii. All other Defects (AOD) should not exceed 8%

iv. Purple colour must not exceed 40%
e. Any cocoa that fails to meet the above standard is classified as Substandard (SS).

Asante (2011)

The graded and sealed cocoa is evacuated by the LBC’s using private cocoa haulers to designated CMC Take over Centers in Tema, Kumasi and Takoradi.

2.7.4 Warehousing and Other Logistics (Private & COCOBOD)

The need for warehousing system in the cocoa sector is to ensure regular supply of cocoa to meet demands all the time. The CMC is responsible for the provision of warehouses and related logistics as well as its management for the storage of cocoa. The Company has three take over centres and at each centre is the Warehouse and Ports Operation Department (WPO) with the main responsibility of;

i. Receiving cocoa from the LBC’s

ii. Managing and storing the cocoa in the warehouses

iii. Evacuating cocoa to the ports of Tema and Takoradi for export and to local factories for processing.

The WPO arranges with transport companies for the evacuation of the cocoa from the inland ports to the Tema and Takoradi TOCs and also to the quay sides when exports are to be made.

2.8 Current State of the TOC Warehouse

Currently, the three Take Over Centers have a total warehouse capacity of about 395,500 metric tones which is distributed as follows;

- Tema- 150,500 tonnes
• Kumasi – 68,000 tonnes,
• Takoradi – 177,000 tonnes.

The warehouses are owned by COCOBOD and other private companies; CMC rents these facilities from COCOBOD and the private companies. In addition to the three TOC’s, COCOBOD has warehousing space in up-country estimated at 574,000 metric tonnes which are being used by the LBCs to store the cocoa before they are evacuated to the TOC’s. There is also warehousing services provided by third parties. Uni-control Commodity Ghana Limited (UCC) provides warehousing services for CMC at the Takoradi Port. The company provides warehousing space for 30,000 metric tonnes of cocoa and has 30 permanent and 300 seasonal workers.

Operations at all the TOC’s are basically manual; only a few sheds have conveyor system to aid stacking and evacuation. WPO operates with a total of 2080 hired labourers who assist in off-loading, stacking, loading, and the general housekeeping of the depots. These labourers work in groups of 130 gangs; each gang is made up of 15 laborers and a foreman.

The product is arranged or stacked on wooden pallets or gratings of 300 tonnes to 350 tonnes which is about 4800 bags to 5600 bags per stack. The stacks are differentiated by their categories and grades; that is, same grades and categories are stacked together. Depending on the height of the roof of the warehouse, stacks are built up to 20 bags high where the stack is manually done and 25 bags where conveyor belts are used.

Clearly, the huge reliance on manual means of operations gives a low turn-around time, increasing cost of operations and inefficient use of available space. This observation was also made by the Chief Executive Officer of COCOBOD, Mr. Tony Fofie who explained...
that "COCOBOD was not able to maximize the space at their warehouses because the workers are not able to pack the sacks at a certain height, which is easily done by the conveyor belts". (www. myjoyonline.com, 2010).

This had contributed to congestion at the various TOCs which is greatly affecting all stakeholders. An investigation by the Business and Financial Times (B&FT) in June, 2011 reported that, over 400 vehicles carrying approximately 15,000 tonnes of cocoa beans are at a standstill at Takoradi and Tema take-over-points, due to inefficient warehouse management by the COCOBOD in off-loading the beans. The investigations indicated that some of the vehicles owned by Licensed Buying Companies (LBCs) in the country have been at the Take-Over-Points for the past four weeks. Each vehicle carries about 600 bags of cocoa beans. B&FT explained further that in terms of finance cost, the companies incur a cost of GH¢1.70 a tonne per day on one vehicle standing at the Take-Over-Points - which translates to GH¢25,500 per day for 400 vehicles at two Take-Over Points. It was also added that, the non-evacuation of the sealed stocks has also affected subsequent grading and sealing of unsealed stocks at the respective companies depots.

In response to this challenge, technological machines such as the weighbridge were installed at the Tema ports warehouses. However, a publication on Friday 5, 2010 at www.myjoyonline.com, indicated that cocoa carriers at the Tema Port are on strike; protesting against installation of new machines.... The workers claim they are unable to meet targets for a daily allowance of GH¢10 since the new machines were installed. Mr. Tony again added that, some workers are frustrating their efforts to improve service at the port by tampering with the machines.
2.9 Literature Summary

Existing studies indicate clearly stakeholders' effort towards increasing cocoa production in Ghana. The cocoa reforms have brought about some level of internal market liberalization (through COCOBOD still controls all areas) which has resulted in increased production. However, the cocoa warehousing system is fully monopolized under the control of the government through CMC. Though this is good to maintain the quality standard of the country's cocoa, non-improvement in the utilization and expansion of these warehouses is retarding the pace of increase in the production of cocoa. Beside this, the reforms and the strategies instituted had little or no focus on cocoa warehouse management.

Furthermore, the recent production target of 1,000,000 metric tonnes of cocoa by 2012/2013 puts more emphasis on the need to review cocoa warehousing in the country. Existing information indicates clearly that, the various Take Over Centres are noted for congestion and delay in off-loading cocoa. In the wake of recent publications in the various media about this menace at the Ghana ports, government has instituted plans for construction, acquisition and expansion of existing warehouses. Little or no attention is being given to the management of the existing warehouse. However, the cocoa warehouse plays a significant role (distribution center) in the value chain process of the cocoa sector. Its efficiency and effectiveness largely affects major stakeholders in the sector.

The literature also identifies a pool of performance measures that can be used to effectively assess the productivity level of a warehouse.
CHAPTER THREE
METHODOLOGY

3.1 Introduction

This chapter discusses the various choices regarding sampling technique, research design, data collection methods and methods of data analysis employed in the conduct of the entire research. It focuses mainly on the relevant research methods, statistical tools and procedures used in every section of the study based on the objectives and hypotheses of the study.

The study took the form of a survey since a sub-section of the population under study was taken to solicit information pertaining to the focus of the study. The study mainly takes the form of an exploratory research. This form of research looks for causes and reasons of a situation, determine which of several explanations is best and advances knowledge about underlying principle. This approach is deemed appropriate for the study considering the objective of study.

3.2 Research Approach: Qualitative and Quantitative

The decision to use quantitative or qualitative research methods depends on the nature of the research problem and research phenomena (Uusitalo 1991). Lundahl and Skarvd (1992) also added that the type to be used is determined by the type of information gathered. In quantitative research, data is in a continuous form or quantified and quantitative statistical methods are used in the data analysis. Descriptive statistics such as the mean, median, mode, standard deviation are computed and are usually for comparison. Qualitative approach aims to provide insight and understanding of a given
phenomenon by assessing such issues as perception or opinion on some issues or services, rating and ranking of items through verbal or visual means. (Malhotra & Birks 2000, 155-156). Normally, the data are categorized into mutually exclusive (belonging to only one of the categories) and exhaustive groups (every item belong to one of the categories). Comparative analysis can then be made among such groupings. Chi-square tool is predominantly used in the analysis of such data.

Whereas these terms are quite distinctive, a number of research problems are effectively addressed through a combination of both with one dominating. Hirsijarvi et al. (2005) stated that, instead of being exclusive, qualitative and quantitative methods should be seen as complementary to one and another. Qualitative research can, for example, be used to precede quantitative research in identifying the appropriate variables that can then be measured. Conversely, a quantitative research may be conducted to discover meaningful differences between groups, which can then be analyzed in qualitative manner to gain understanding of the reasons for differences between the groups. Malhotra and Birks (2000), and Descombe (2000) also confirmed the simultaneous usage of the two approaches in research.

In this study, the qualitative approach dominated considering the objective set and the fact that, a higher proportion of the information to be gathered are qualitative in nature.
3.3 Sources of Data

The study relied mainly on primary sources of information. The primary data was gathered through questionnaire administration. This was necessitated by the lack of existing records of data on the study area. Furthermore, the choice for primary data was to ensure that data gathered was focused on the specific research questions and objectives of the study, and also to gain access to first hand information which was believed to be more reliable and representative of the population. Secondary sources such as the internet, and libraries were also used to assist in exploring the study area especially warehouse management and supply chain process.

3.4 Target Population and Sample Size

The target population is the population about which information is required to specifically address the research objectives. These are entities with reliable information and in-depth knowledge about the area of the study. In this study, the target population is all parties involved in the daily operations of the Warehouse and Port Operations department of the Tema Take Over Centres. These are categorized into three;

- Management staff of CMC
- Senior and junior staff of WPO department
- Representatives of LBCs and some shipping companies

The table below gives an overview of the population of the target group and the sample size used for the study.
Information from the staff of WPO focused on assessing the general operation of the department, availability and state of equipment, knowledge base and utilization of space at the warehouse. The LBCs are the immediate users of the warehouses and interact regularly with the staff of TOC. The extents to which they are satisfied largely reflect the level of efficiency of the take over centres. Thus, the selection of the LBCs as part of the target population was to assess the challenges of the warehouse management from their perspective and also ascertain the responses of the staff of TOC. Overall, the total sample size is 98 with the breakdown as shown in the table above.

3.5 Sampling Procedure

Since the entire entities/members in the target population cannot be contacted due to resource constraints (time, financial, accessibility), an appropriate statistical technique is required to select a section of the population to form a sample such that, every statement and conclusion drawn from the study will be a true reflection of the target population. The collection of these techniques is termed as the Sampling procedure.
Among the several methods of sampling, the study adopted the Simple Random Sampling method. This method requires the availability of a sample frame which is a list of all the members of the target population. The choice of this method was due to the fact that,

- It allows everybody of the target population the opportunity to be selected into the sample since the selection is at random
- Members in each group are homogenous
- There is a list of all staff available for selection which makes it possible for simple random sampling to be carried out.
- The sample drawn is uniformly distributed over the entire population which results in un-biasness and accuracy in estimating population parameters.

Since the characteristics of each category of the population vary from another, the population was divided into groups and within each group; the simple random sampling method was carried out. Thus, by this means, the method ensured that characteristics of each group are represented in the sample.

The simple random sampling method was carried out by writing the names of the staff on pieces of paper and putting them in a box. A piece of the paper was picked at random after shuffling the contents of the box. This was done several times until the required sample size was obtained. The selected staff were contacted for the information required. This was done in the entire category to get the entire sample size.
3.6 Method of Data Collection

The primary data was collected by a survey using self-administered structured questionnaires and personal interview. The rationale for adopting this mode (self-administered structured questionnaire) was due to the ease with which it could be carried out. This also allowed the respondents to answer the questions at their leisure time thereby increasing item response rate and the overall response rate as well. The item response rate is the number of questions answered on a questionnaire by a respondent expressed as a percentage of the total number of questions asked. The unit response rate is the number of questionnaires answered and retrieved from the field out of the total distributed out. The use of the structured questionnaire was to establish a standard procedure for collecting the data, enhance the accuracy of recording and ease data processing.

Two sets of questionnaire were designed; one set was directed to the staff of TOC and the other set to the LBC and the shipping companies. The design took into consideration simplicity, un-ambiguity, clarity of questions, and attractiveness of the questionnaire. For both categories, the questionnaire was mainly close ended questions and a few open-ended questions. The close ended questions were to ensure that responses are given in a frame of reference that is relevant to the purpose of the study and also reduce time spent in answering the questions. It was also to ease data processing and analysis. The open-ended questions on the other hand was to provide an opportunity for the respondents to express themselves in their own terms and also provide the researcher with some information not previously thought of.
The questionnaires were administered to the randomly selected employees in person at their various sites and after a two-week period, the answered questionnaires were collected back. Follow-ups through telephone calls and personal contacts were made during the two-week period. This duration and follow-up procedures ensured that most of the participants responded in the survey thereby leading to high response rate.

3.7 Statistical Tool application

In analyzing the research data, descriptive analysis, which involves the use of frequencies, percentages, and graphs were frequently used. The Chi-square procedure was the major advance statistical tool used in the analysis. This tool was used to examine association or relationship between two variables.

- The relationship between Staff position and opinion about warehouse management
- Assessment of the effectiveness of the warehouse management differ significantly from one institution to the other (that is, the views of staff in toc will vary from those in other institution)

Contingency tables were generated to illustrate the frequency distribution of one variable against another variable; one variable is displayed on the row and the other variable at the column section. A Pearson chi-square value with a corresponding p-value was computed based upon which conclusions were drawn as to whether one categorical variable influences the other. A large Pearson chi-square value with a corresponding small p-value leads to the conclusion that, there is significant relationship between the
two categorical variables and vice versa. The p-value is considered small when it is compared with, and it is smaller than, the selected level of significance.

3.8 Data Analysis

Data processing and analysis began when the empirical data had been collected. Statistical software was used to enable a thorough statistical analysis and precision in the calculation to be done thereby leading to better and reliable conclusions. The SPSS (Statistical package for social sciences) software and excel were used. The analysis went through three major stages as discussed below. This is confirmed by Miles and Huberman (1994) who wrote that qualitative data analysis focuses on data in the forms of words, and that the analysis consists of three simultaneously different activities. The stages are:

a. Data extraction and reduction

This is the initial process of the analysis of data where the collected data is abstracted, simplified and transformed into appropriate form so as to ensure reliable deductions. The responses are extracted and coded into the statistical software.

b. Frequency and Descriptive Output

After proper transformation of the data, they are then organized in a compressed way. Frequency tables, bar graphs and pie charts are the major summary output on the qualitative data. This presents the percentages of respondents with a particular opinion.
c. Interpretation of Output

Comments and explanations are made on the organized outputs generated to draw conclusions and verification. This is done by noting regulations, patterns, explanations, causal flow and propositions.
CHAPTER FOUR

DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

The primary objective of this section of the report is to address the research objective and hypotheses by statistical procedures. This is through the application of statistical tools in the analysis and interpretation of the data collected from the field.

Primary data which were gathered through structured questionnaire were mainly used for the analysis. Out of the 105 total questionnaire administered, a total of 74 were retrieved resulting in 70.4% overall response rate. The response rate was highly affected by the limited time to complete the whole study and difficulty of getting the selected staff (based on the probability sampling technique selected) to answer the questionnaire.

The analysis began with data processing and management where the data was coded and entered into computer software (SPSS, Excel). During this process, highly incomplete answered questionnaires were detected and eliminated. This affected the item and unit response rates but ensured accurate information which resulted in reliable findings, conclusions and recommendations. Hence, the total frequency for a particular response (item response rate) may be less than the total sample size retrieved. At the analysis stage, frequency distribution tables, cross-tabulations and graphs were mostly used to illustrate and support a number of statements made. The choice of these methods was due to the qualitative or categorical nature of the data gathered. Statistical tools mainly chi-square procedure and paired sample T-test were employed to test and confirm critical statements pertaining to the objectives. The analysis report covers responses obtained from staff of Tema TOC and the LBCs.
4.2 Demographic information

The study deemed it relevant to assess some demographic characteristics as it is in line with the study objectives and hypotheses. These elements provided auxiliary information about the respondents and analysis of such information supports the main analysis pertaining to the research. These include, age, educational background, position and years of working at the current department.

In most organizations, the position one occupies largely influences his or her decision or opinion on issues. At the TOC in Tema, Senior staff undertakes mainly managerial and supervisory roles while the Junior staffs execute the daily routine task. By the nature of their work, the challenges that confront one may vary from the other. Again, staff may have varying views depending on their age, years of working in that position, and educational background.

Table 4.1 and Figure 4.1 give the age frequency distribution of the respondents with respect to the Senior and Junior category of staff/respondents.

Table 4.1: Age Distribution of Staff at the TOC

<table>
<thead>
<tr>
<th>Age category</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>21-30yrs</td>
<td>43</td>
<td>58.1</td>
</tr>
<tr>
<td>31-40yrs</td>
<td>15</td>
<td>20.3</td>
</tr>
<tr>
<td>41-50yrs</td>
<td>13</td>
<td>17.6</td>
</tr>
<tr>
<td>50yrs and above</td>
<td>3</td>
<td>4.1</td>
</tr>
<tr>
<td>Total</td>
<td>74</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: field work, 2011
It can be noted from Figure 4.1 that, whereas majority of the Junior staff are within the age range of 21 years to 30 years, the age group of the Senior staff is fairly distributed above 31 years with the majority falling between 41 and 50 years. This deduction is through comparison of the valid percentages. However, the overall age range with the highest frequency or percentage is 21 years to 30 years (with 58%) as can be observed from Table 4.1. This is an indication that most of the staffs at the various warehouses of the Tema TOC are young and vibrant.
Table 4.2 gives the education characteristics of respondents.

Table 4.2: Educational Level of Senior and Junior staff of Tema TOC

<table>
<thead>
<tr>
<th>Position category</th>
<th>Educational Level</th>
<th>Frequency</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>HND And Tertiary</td>
<td>8</td>
<td>61.5</td>
</tr>
<tr>
<td></td>
<td>Masters Related</td>
<td>4</td>
<td>30.8</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>1</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>13</td>
<td>100.0</td>
</tr>
<tr>
<td>Junior</td>
<td>SHS,GCE/A’level</td>
<td>20</td>
<td>32.8</td>
</tr>
<tr>
<td></td>
<td>HND And Tertiary</td>
<td>36</td>
<td>59.0</td>
</tr>
<tr>
<td></td>
<td>Master’s Related</td>
<td>5</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>61</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Figure 4.2: Educational Background of respondents from Tema TOC
A general observation from Figure 4.2 is that, a cumulative of 73% of the respondents has attained formal education to HND or above. A total of 60% have acquired formal educational certificate at the HND or tertiary level. Inference from Table 4.2 indicates that, this educational level tends to be the same for Junior and Senior staff though a few of the Senior staff have acquired master’s degree. Thus, education wise, there are no much difference among the staff.

In Table 4.3 is a descriptive statistics of the years spent working in the organization.

Table 4.3: Descriptive Statistics on years of working at the Tema TOC

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of Respondents</th>
<th>Average Years of Working in the organization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>12</td>
<td>16.3</td>
</tr>
<tr>
<td>Junior</td>
<td>61</td>
<td>5.9</td>
</tr>
<tr>
<td>Overall</td>
<td>73</td>
<td>7.6</td>
</tr>
</tbody>
</table>

The years spent at the work place of the Senior staff is about 3 times that of the Junior staff as indicated by the mean figures of 16.3 years for Senior staff and 5.9 years for the Junior staff. This is an indication that, more years of working is required before one is promoted to Senior position.
4.3 Objective Analysis

4.3.1 Days spent at the Warehouses

As indicated in the literature, LBC buys cocoa from the farmers in the hinterlands and transport to the TOC. These companies make margins depending on volume of cocoa brought to the TOC from the villages. Hence, a higher margin is associated with large turnover rate and vice versa. In this regard, the amount of time spent at the warehouse greatly affects the business of the organization.

Figure 4.3 gives a summary of the waiting time of LBC at the Tema TOC before off-loading cocoa bags. The figure gives the illustration for the various periods of the season.

![Figure 4.3: Waiting time of LBCs at the Warehouse of Tema TOC](image)

Source: Field work, 2011
Considering the percentage distribution of responses as shown in Figure 4.3, it can generally be seen that, LBCs spend a week or less at the warehouse before off-loading their goods at the beginning and latter part of the cocoa season. During the middle part of the season, it is highly noted that LBCs spends two to three weeks before off-loading their transported cocoa bags.

The analysis examined further to ascertain whether there are differences in responses to the waiting time of LBCs between Senior and Junior staff at the TOC. The result is summarized in Table 4.4.

Table 4.4: Views of respondents on waiting time of LBCs at the Warehouse

<table>
<thead>
<tr>
<th>Position category</th>
<th>Waiting time category</th>
<th>Beginning</th>
<th>Middle</th>
<th>later</th>
</tr>
</thead>
<tbody>
<tr>
<td>Senior</td>
<td>within a week</td>
<td>92.3</td>
<td>7.7</td>
<td>84.6</td>
</tr>
<tr>
<td></td>
<td>two to three weeks</td>
<td>7.7</td>
<td>84.6</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>a month</td>
<td>0</td>
<td>7.7</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>more than a month</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Junior</td>
<td>within a week</td>
<td>78.7</td>
<td>25.5</td>
<td>85.5</td>
</tr>
<tr>
<td></td>
<td>two to three weeks</td>
<td>8.2</td>
<td>60.0</td>
<td>14.5</td>
</tr>
<tr>
<td></td>
<td>a month</td>
<td>6.6</td>
<td>14.5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>more than a month</td>
<td>6.6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

From Table 4.4, it can be observed that, the response percentage distribution for Senior and Junior category of staff about waiting time of LBC's tends to be the same for
all periods of the season. That is both Senior and Junior staff hold the same view about the waiting time of LBCs at the TOC.

The study also solicited the views of staffs as to whether the number of days spent by the LBC is beyond what is expected.

![Figure 4.4: Percentage Distribution of responses as to whether LBC waiting time is beyond expectation](image)

By comparing the percentages of the responses, it can be said that in all period of the season, the time spent by LBCs before off-loading is generally beyond expectation; about 50% of the responded staff perceive the time spent to be high for all period of the season. In the middle of the season, this waiting time is largely known by majority of the staff (82%) to be beyond expectation.

Further analysis was conducted to identify which category of staff do or do not perceive the waiting time of LBCs as beyond expectation. Table 4.5 is a cross-tabulation of the
position of respondents and the corresponding response to whether LBC waiting time is beyond expectation during the beginning of the season. This table examines whether one position influences his or her perception about the waiting time for LBCs before off-loading.

Table 4.5: Cross-tabulation of Position status and response to whether waiting time is beyond expectation at the beginning of the season

<table>
<thead>
<tr>
<th>Position category</th>
<th>Whether waiting time of LBC is beyond expectation</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>no</td>
</tr>
<tr>
<td>Senior</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>% within position category</td>
<td>23.1%</td>
<td>76.9%</td>
</tr>
<tr>
<td>Junior</td>
<td>37</td>
<td>18</td>
</tr>
<tr>
<td>% within position category</td>
<td>67.3%</td>
<td>32.7%</td>
</tr>
<tr>
<td>Total</td>
<td>40</td>
<td>28</td>
</tr>
<tr>
<td>% within position category</td>
<td>58.8%</td>
<td>41.2%</td>
</tr>
</tbody>
</table>

Comparing the percentage distributions, it can be observed that, majority of the Junior staff (67.3%) perceive LBC waiting time to be beyond expectation than the Senior staff (23.1%). A statistical test of this observation using chi-square test produced a Pearson chi-square value of 8.479 with a corresponding significant value or p-value of 0.004. This is shown in Table 4.6.
Table 4.6 Chi-Square Tests

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
<th>Degree of freedom</th>
<th>Sig. value or P-value (2-sided)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson Chi-Square</td>
<td>8.479</td>
<td>1</td>
<td>0.004</td>
</tr>
<tr>
<td>valid response</td>
<td>68</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Since the p-value of 0.004 is less than the selected significant level of 5%, it can be concluded that Junior staff perceive the waiting time of LBCs at the beginning of the season to be more than expected while the Senior staff sees it as normal.

During the middle period of the season however, both Junior and Senior staff have the same view about the waiting time of LBC at TOC; which is waiting time beyond expectation. This is confirmed by the summarized responses in 4.5.

Figure 4.5: Cross-tabulation of Position status and response to whether waiting time is beyond expectation at the middle of the season
In the latter part of the season, about 50% of staff in each position category perceives LBC waiting time as high. This suggests that there are some warehouses that have constant congestion or high waiting time of LBCs; these need to be identified and improved.

Another observation made from the data exploration was that, depending on the number of years spent in the organization, employees tend to have different perception about the waiting time of LBC. Table 4.7 gives the average years of service of employees with particular perception about the waiting time of LBC. For each response

Table 4.7: Association between Years of Service and Employee Perception about LBC Waiting Time

<table>
<thead>
<tr>
<th>Employees Perception about LBC Waiting Time</th>
<th>Average Years of Service of Respondents with particular perception about LBC Waiting Time</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Beginning</td>
</tr>
<tr>
<td>Beyond Expectation</td>
<td>4.9</td>
</tr>
<tr>
<td>Normal or Below Expectation</td>
<td>11.7</td>
</tr>
</tbody>
</table>

It can be observed from the above table that, employees with less years of service perceives LBC waiting time as beyond expectation while those with longer years of service perceives otherwise. This suggests that the current LBC waiting time has existed for so long and gradually becomes accepted operational level.
4.3.2 Causes and impact of LBC delay

A number of issues were retrieved from respondents as reasons to the causes of the undue delay of LBCs at the TOC. Among the frequent and lamenting ones are:

- Inadequate warehouse, lack of space and storage capacity, poor planning and management of shed space
- Unstable power and inadequate stand by generator, bribery and corruption by staff, LBCs and transporters, so first come first served not observed,
- Too much influx and uncontrolled deliveries of cocoa trucks from LBCs above their quota, more trucks available to be off-loaded but gangs are not able to work during rainy season. Most of the respondents explained that, at the beginning of the season, LBCs do not stick to the quota allotted and hence the flow of trucks from upcountry can be overwhelming considering the inadequate space and labor.
- Inability to ship early to create space to warehouse cocoa
- During mid season, delays are mostly caused by the type of category that LBCs are carrying since such category may not have stack available for them
- Later season may see delays and this can also be attributed to the type of category and most often due to mop up of different categories on one truck
- Mid season is mostly the time LBCs present huge quantities of cocoa by that time almost all our warehouses are full, and the rate of shipment does not commensurate with the receipt
4.3.3 Impact of LBC delay at the Warehouse

The list below represents the comments of the respondents as the impact of the delay at the warehouse. Although much was not said about impact it has on the cocoa quality, more instances were mentioned on the part of the operations of the company.

<table>
<thead>
<tr>
<th>Impact on cocoa quality</th>
<th>Operations of the company</th>
</tr>
</thead>
<tbody>
<tr>
<td>- cocoon infestation, cocoa beans get wet especially during the rainy season and become mouldy</td>
<td>- additional work; spend time treating discrepant cocoa, becomes impossible to meet daily target, staff are compelled to work 7 days in a week</td>
</tr>
<tr>
<td>- moisture content is affected due to lack of aeration on trucks</td>
<td>- congestion, pressure mount on management from transport owners</td>
</tr>
<tr>
<td>- not enough time to check laid down quality procedures due to pressure of work leading to wet bags</td>
<td>- adds up to our cost of operations, extra labour are used, hence the financial losses</td>
</tr>
<tr>
<td>- not applying FIFO concept of warehousing</td>
<td>- results under pressure on staff leading to mistakes, inefficiency sets in as cocoa that should otherwise be rejected are taken over, delivery to our foreign buyers are at times affected</td>
</tr>
<tr>
<td>- quality does not change</td>
<td>- most cocoa rejected during off-loading thus reducing cocoa needed for shipment and factories</td>
</tr>
<tr>
<td></td>
<td>- work become stand still and gangs can't meet their allocated quantity but are paid fully which is a cost to the company. also staff become redundant; a cost</td>
</tr>
</tbody>
</table>
In the wake of the increasing level of production, the TOC needs strong staff strength in order to deliver satisfactorily across board. The number of competent staff should be adequate and be provided with regular in-service training specifically related to their job. The development of strong human resource capacity also requires target setting and supervision.

### Table 4.8: Summary of responses to issues of staffing and training needs

<table>
<thead>
<tr>
<th>Staff Size</th>
<th>Availability of Training</th>
<th>Content of Training</th>
<th>Frequency (%)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100'000</td>
<td>0</td>
<td>Highly inadequate</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>13'8</td>
<td>8</td>
<td>Inadequate</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>51'7</td>
<td>30</td>
<td>Inadequate</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>34'5</td>
<td>20</td>
<td>Highly inadequate</td>
<td>41</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Frequency (%)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highly inadequate</td>
<td>Inadequate</td>
</tr>
<tr>
<td>Inadequate</td>
<td>Adequate</td>
</tr>
<tr>
<td>Adequate</td>
<td>Highly adequate</td>
</tr>
</tbody>
</table>

Table 4.8 summarizes the responses to issues of staffing and training programs for staff at the various warehouses.

A. Staff and Training

Staffing and supervision

The development of strong human resource capacity also requires target setting and be provided with regular in-service training specifically related to their job. In order to deliver satisfactorily across board, the number of competent staff should be adequate. In the wake of the increasing level of production, the TOC needs strong staff strength in the following levels:

4.3.4 Human resource capacity
Observation from table is that, staff strength at the TOC is seen to be very weak. A cumulative of 59 valid responses constituting 80% found the number of staff at the warehouses to be inadequate. Almost all the respondents (a cumulative of 98.5%) confirmed the lack of available training or workshop for staff. The few that are organized were also confirmed to be lacking content reflecting needed knowledge.

b. Performance Appraisal

The conduct of performance appraisal is paramount to every organization as it develops and brings out the best in staff in achieving targets. Regular target setting, monitoring and supervision also ensure that, targets are achieved with a deadline. In the various warehouses of TOC of Tema, appraisal, target setting and supervision are known to be highly inadequate. The output is summarized in Table 4.9.

Table 4.9: Summary of Responses to Issues of Appraisal and Supervision

<table>
<thead>
<tr>
<th></th>
<th>Appraisal and target setting</th>
<th>Supervision and Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency  Percent (%)</td>
<td>Frequency  Percent (%)</td>
</tr>
<tr>
<td>Highly inadequate</td>
<td>20   32.3</td>
<td>8   11.8</td>
</tr>
<tr>
<td>Inadequate</td>
<td>18   29.0</td>
<td>24  35.3</td>
</tr>
<tr>
<td>adequate</td>
<td>20   32.3</td>
<td>31  45.6</td>
</tr>
<tr>
<td>Highly adequate</td>
<td>4    6.5</td>
<td>5   7.4</td>
</tr>
<tr>
<td>Total</td>
<td>62    100.0</td>
<td>68  100.0</td>
</tr>
</tbody>
</table>
From Table 4.9, it can be observed that, about 50% or more of the respondents testified that, appraisal and target settings are inadequate. Similar percentage of respondents also concluded the inadequacy of supervision and monitoring in the warehouses.

c. Internal controls

Figure 4.6 below gives the percentage distribution of the responses to presence of internal control procedures and adherence to such procedures.

![Bar chart showing internal control procedures and adherence](image)

**Figure 4.6: Summary of Responses to Issues of Internal controls and Adherence**

Internal control procedures were found to be available and adequate in most of the warehouses as confirmed by a cumulative 70.2% of the respondents. However, adherence to such controls was found to be adequate. A total of 42.5% of the respondents confirmed that there is inadequate adherence to the internal control procedures.
d. Working Tools/ Equipments

Table 4.10 summarizes the responses to questions that seek to address issues on working tools.

**Table 4.10: Summary of Responses to Issues of working tools/Equipment**

<table>
<thead>
<tr>
<th></th>
<th>Availability of needed tools</th>
<th>Quality of current tools</th>
<th>Computer Application</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Percent</td>
<td>Frequency</td>
</tr>
<tr>
<td>Highly inadequate</td>
<td>12</td>
<td>16.4</td>
<td>16</td>
</tr>
<tr>
<td>Inadequate</td>
<td>38</td>
<td>52.1</td>
<td>25</td>
</tr>
<tr>
<td>Adequate</td>
<td>14</td>
<td>19.2</td>
<td>17</td>
</tr>
<tr>
<td>Highly adequate</td>
<td>9</td>
<td>12.3</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>73</td>
<td>100.0</td>
<td>67</td>
</tr>
</tbody>
</table>

Assessment of all the percentage responses indicates that, the warehouses have serious problem with equipment or working tools. Generally, only about 30% of the respondents confirmed the adequacy and availability of working tools. The use of information technology in the various warehouses is seriously absent. A cumulative of 85.5% of the respondents testified that, computer usage is inadequate.
e. Space utilization

Figure 4.7 illustrates the availability of space and its utilization at the warehouse.

Figure 4.7: Summary of Responses to Issues of Space and its Utilization

Inference from Figure 4.7 is that, majority of staff of the warehouse of the TOC perceive the available space for storage to be inadequate (56.7%). Again, 45.2% of the staff or respondents are of the view that, available spaces are not effectively utilized.

f. Overall efficiency

As indicated in Figure 4.8 below, about 38% of the respondents were of the view that, management of cocoa warehousing at the Tema TOC has been efficient. Thus, the area lacks a number of equipments and also challenged in a number of ways.
Figure 4.8: Assessment of the overall efficiency of Warehouse Management at Tema TOC

4.4 Responses from LBCs

The study solicited information from the LBCs to further support and confirm or otherwise the responses obtained from staff of the warehouse. Responses were obtained from five (5) of the LBCs out of the total ten (10) targeted. Respondents were those in managerial position.

Waiting time: Respondents confirmed that, generally, the waiting time at the TOC is two to three weeks. This number of days spent is seen to be beyond expectation. According to the LBCs, the causes of the delay are attributed mainly to the following:
• Limited capacity or inadequate space-
• Ineffective utilization of space- this is mainly because of the separation by categories
• Inadequate labor

According to the LBCs, the major impact of the delay on cocoa is that, the beans do not dry thoroughly especially during the rainy season. On the part of their operations, major issues commented on were:

• Congestion at up-country depots/warehouses. The periods spent at the TOC correspondingly affect the situation at the upcountry storage centers turnout and turnaround time for subsequent loading is very low and hence the congestion at the upcountry.
• High interest charges
• Losses on LBCs

On issues of challenges currently confronting warehousing management at the TOC, the major issues mentioned by LBCLs are:

• Limited space
• Inadequate equipment e.g conveyors, computer etc
• Lackadasical approach to work on the part of some staff
• Manual (labour intensive) method of handling stock in the light of increasing volumes of cocoa production
• Inability to increase operational (working) points allegedly due to QCCs constraints on staff
• Management of the Quota system

58
Staff strength at the Tema TOC warehouses was confirmed by the LBCs to be inadequate. The competent level of the existing staff was however mentioned to be adequate. The use of the requisite tools and equipment in the warehouse was mentioned to be inadequate. Additionally, the use of technology is perceived to be completely out at the various TOC warehouses.

4.4.1 Recommendations from LBCs

Among the recommendations solicited from the LBCs were:

- Mechanizing greater portion of works (reducing the manual means of operations)
- Reducing volume of paper work like Cocoa Taking over Received (CTOR) processing, LBCs use of Internal Waybill
- Increasing warehousing capacity to take care of the increasing production
- LBCs and therefore haulers should be compensated for long delays of vehicles
- Abolish Quota System as it exists now and seek to off-load on FIFO basis.
CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This is the concluding chapter of the study report. The study began with the primary objective to identify how warehousing of cocoa in Ghana can be improved to ease congestion at the takeover Center. Below are the key findings and recommendations.

5.2 Summary of Findings and Discussion

Waiting time of LBC at TOC before off-loading

Findings from the study confirms that, LBCs waiting time at the Tema TOC warehouses before off-loading transported cocoa bags, is between one and three weeks. Thus, the minimum waiting time is one week and this occurs during the beginning and latter part of the cocoa season. The maximum waiting time occurs in the middle of the season. The difference in the waiting time for different periods of the cocoa season is expected because production level varies with regards to these periods. The beginning and latter part of the season is noted for low production while the middle of the season is where production is at its peak.

This waiting time irrespective of the period of the season was found to be generally beyond expectation; a situation that was confirmed by both staff of the TOC and the LBCs. Thus, even the identified minimum period of one week is still an undue delay.
Another finding from the study is that, Junior staff perceives the waiting time of LBC at the warehouse to be beyond expectation compared to the Senior staff. Whereas Junior staff sees the waiting time as undue for all period, Senior staff sees it as undue mostly during the middle of the season. Also, staffs, that have worked in the organisation for less than five (5) sees the waiting time to be problematic than those who have worked above five years in the organization. Deductively, it can be argued that the waiting time of LBCs has been so as for a long time and as such has become normal to those who have been working in the organization for long years.

Another finding from the study is that, the cause of the waiting time is diverse with the major ones being lack of space in the warehouse, breakdown or unavailability of equipment, and uncontrolled quota deliveries of cocoa by LBCs. The uncontrolled quota deliveries might be attributed to the fact that, LBCs make profit or fixed margin depending on the volume bought and brought to the TOC warehouse. Thus, more of the capable companies tend to go beyond their quotas.

Impact: During this time, cocoa beans get wet and mouldy especially during the rainy season. However, this does not significantly affect the quality of the beans because TOC takes the responsibility to treat all discrepant cocoa beans. These additional works puts pressure on the staff of TOC and hence are unable to meet their targets. There is financial loss to the company (CMC) since more hands are required. Work becomes stand still and gangs can't meet their allocated quantity but are paid fully which is a cost to the company.
For the LBCs the congestion at the TOC due to the waiting time causes a negative effect on their operations since their trucks turn out for loading drastically reduces. There is huge loss of revenue.

5.3 Challenges of Cocoa warehousing at the Tema TOC

Human resource capacity

The study established that the number of staff at the Tema TOC warehouse is inadequate for the workload. There is also lack of training to equip the skills and knowledge of staff on warehouse management. Again, performance appraisal, target settings and monitoring are also lacking in the warehouses. The study also realized that in most warehouses, there are adequate internal control procedures but adherence to such procedures were lacking.

Tools/equipment: The cocoa warehouses existed with 70% not having the required equipment. Necessary equipment such as weighing bridges, conveyor belts, fork lift are only found in a few of the warehouses. The use of modern technology such as computer aided programs and machines are almost unavailable in all the warehouses. The literature points out a publication where gang boys demonstrated against the installation of some machinery for fear of not achieving their daily target. Therefore, the mechanization and automation should be done alongside requisite training and proper allocation of gang’s boys so as not to render anybody redundant.

Space utilization: Findings from the study clearly indicates that the existing warehouses and hence space are not adequate. In addition, management of the available space is known among 45% of the staff to be ineffective. The manual means of operations of the
warehouse largely contribute to the inadequate usage of space as confirmed by literature that, depending on the height of the roof of the warehouse, stacks are built up to 20 bags high where the stack is manually done and 25 bags where conveyor belts are used.
5.4 Conclusions

In conclusion, waiting time of LBC at the TOC is very high and beyond expectation with associated high cost to both LBCs and the operations of CMC.

Warehouses at the Tema TOC are highly inadequate and the available spaces are not effectively utilized due to lack of requisite modern equipments (computer application and mechanization), lack of staff development and lack of adherence to internal controls.

In the wake of increasing production and high target being set, it is necessary to consider and implement the recommendations of this study as a means of enhancing organizational efficiency and effectiveness.
5.5 Recommendations

The recommendations below are based on the findings and conclusions from the study. The researcher believes that, implementing these findings will improve the warehousing of Cocoa in Ghana.

It is recommended that the manual means of operations must be replaced with modern equipment. This will reduce the number and time spent by the gangs thereby reducing cost and enhancing efficiency. This replacement will aid achieving targets set.

The use of computer technology should be given critical focus for CMC to keep the pace of production, demand and change. Suitable warehouse management system must be explored and adopted to enhance operational efficiency.

Additionally, CMC should undertake a training needs assessment and recommend an appropriate training programme for all staff. Considering the important position of the warehouse in the supply chain of cocoa production and distribution, the content of the training program should focus on supply chain management and best warehouse practices.

Casual workers (gangs) must be given requisite orientation before new equipment is introduced to avoid agitation through misinformation and wrong perception. There is also the need for education for LBCs on how to store cocoa to ensure that quality of the beans will be maintained even if there are delays.

Warehouse layout and space utilization of the existing warehouses should be reviewed with the aim of efficiently utilizing every storage space available.
COCOBOD and CMC should enforce the quota system and improve upon it to effectively regulate and harmonize evacuation of Cocoa by LBCs to and from the Take Over Centres, even though the LBCs suggested it to be abolished.

Punitive sanctions should be implemented for any aberration of this directive. This will prevent or minimize excess supply of trucks by some LBCs which in effect will reduce congestion drastically.
REFERENCES


Kwame Asante & Associates (2011). Restructuring of Cocoa marketing Company (CMC) Limited; a draft report presented to the CMC


Ling Li (2007): *Supply chain management: concept, techniques and practices; enhancing value through collaboration* by Old Dominion University, USA. Published by World Scientific Publishing Co. Plc. Ltd Singapore


Ministry of Manpower, Youth and Employment, 2008: *Labour Practices in Cocoa Production in Ghana (Pilot Survey).*


APPENDIX A: QUESTIONNAIRE FOR TAKE OVER CENTRES
THE REGIONAL MARITIME UNIVERSITY, ACCRA

SURVEY QUESTIONNAIRE (for TOC)

This questionnaire is designed to solicit information to assess and improve the management of Warehousing of Cocoa at the Port of Tema. All information gathered is solely for research purposes and would be treated with utmost confidentiality. Circle your answer.

Background information

1. Name of center

2. Number of Years you have worked with this organization

3. Current Position
   i. Management staff
   ii. Senior staff
   iii. Junior staff
   iv. Other (specify)

4. Gender of respondent
   i. Male
   ii. Female

5. Age of respondent
   i. 21-30yrs
   ii. 31-40yrs
   iii. 41-50yrs
   iv. 50yrs and more

6. Highest formal education acquired?
   i. up to JSS
   ii. SHS, GCE, O/A EVEL
   iii. HND and Tertiary
   iv. Masters related
   v. Others (specify)

Section B: Specific Objectives

7. How many days/weeks do LBCs spend in the Takeover centre before being off-loaded?
(a.) Beginning of the season:
   i. Within a week   ii. two to three weeks   iii. a month   iv. more than a month
(b.) Middle of the season:
   i. Within a week   ii. two to three weeks   iii. a month   iv. more than a month
(c.) Latter part of the season:
   i. Within a week   ii. Two to three weeks   iii. a month   iv. more than a month

8 [A] Do you see this number of days as beyond what is expected?
   (a) i. Yes   ii. No
   (b) i. Yes   ii. No
   (c) i. Yes   ii. No

[B] if yes, explain what causes the delay;

a. .............................................................. .............................................................. .............................................................. ..............................................................

b. .............................................................. .............................................................. .............................................................. ..............................................................

c. .............................................................. .............................................................. .............................................................. ..............................................................
9. What impact has this got on:

<table>
<thead>
<tr>
<th>a. quality of cocoa beans</th>
<th>b. operations of the company</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td></td>
</tr>
</tbody>
</table>

10. What are the major challenges currently confronting warehousing management at the TOC?

i. ............................................................

............................................................

ii. ............................................................

............................................................

11. What measures are being taken by Cocoa Marketing Company to improve storage capacity and quality of cocoa beans?

i. ............................................................

............................................................

ii. ............................................................

............................................................

12. How effective has these measures been?

i. Very effective   ii. Effective   iii. Ineffective   iv. Highly ineffective
13. Give your assessment of the following in relation to the daily operations of the warehouse? **Circle your correct response**

<table>
<thead>
<tr>
<th>View/Response</th>
<th>Highly inadequate (1)</th>
<th>Inadequate (2)</th>
<th>Adequate (3)</th>
<th>Highly adequate (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Number of staff at the warehouse</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b. Competence of staff</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c. Availability of training/workshop for staff</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>d. Frequency of training/workshop</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e. Number of in service training on the in the last five (5) years (specify)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Content of training reflect needed knowledge</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>g. Performance Appraisal, target setting</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>h. Supervision and monitoring</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td><strong>(Internal control measures)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. Internal controls procedure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>j. Adherence to rules and regulations</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>k. Availability of needed tools</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>l. Quality of current tools</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>m. The use of computer technology</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>n. Availability of space</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>o. Effective utilization of space</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>p. overall efficiency of the warehouse management</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
14. Give possible recommendations to improve the management of warehouse operations at the TOC.
APPENDIX B: QUESTIONNAIRE FOR LBCs

THE REGIONAL MARITIME UNIVERSITY, ACCRA

SURVEY QUESTIONNAIRE (for LBC)

This questionnaire is designed to solicit information to assess and improve the management of Warehousing of Cocoa at the Port of Tema. All information gathered is solely for research purposes and would be treated with utmost confidentiality. Circle your correct response

Section A: Background Information

1. Name of organization ........................................................................................................................................

2. Years of operation of the company ................................................................................................................

3. Position of respondent ........................................................................................................................................

4. Category of your section
   i. License Buying Company (LBC)
   ii. Shipping Company
   iii. Others (Specify) .........................................................................................................................................

5. Years spent in the organization ....................................................................................................................

Section B: Specific Objective

6. How many days/weeks do you spend at the warehouse Takeover center?
   i. Within a week    ii. two to three weeks    iii. a month    iv. more than a month

7a. Do you see this number of days as beyond what is expected?
   i. Yes    ii. No
b. if yes, explain the cause of that?

i. .................................................................................................

.................................................................................................

ii .................................................................................................

.................................................................................................

8. Explain the impact the number of days spent at the warehouse have on;

<table>
<thead>
<tr>
<th>a. quality of cocoa beans</th>
<th>b. operations of your company</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.</td>
<td>i.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>ii.</td>
<td>ii.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. In your view, what specific challenges are confronting warehousing management at the TOC?

i. .................................................................................................

.................................................................................................

ii .................................................................................................

.................................................................................................
10. Give your assessment of the following in relation to the daily operation of the management of the TOC? Circle any one (1) number that suits your answer

<table>
<thead>
<tr>
<th>Human resource</th>
<th>Highly inadequate (1)</th>
<th>Inadequate (2)</th>
<th>Adequate (3)</th>
<th>Highly adequate (4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Number of staff at the warehouse</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>b. Staff Competence</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>c. Level of supervision and monitoring</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>(Internal control measures)</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>d. Internal controls procedure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e. Adherence to rules and regulations by all</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>f. Availability of needed tools</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>g. Quality of existing tools and equipment</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>h. The use of Computer technology</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>i. Availability of space</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>j. Effective utilization of available space</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>k. Overall efficiency of the warehouse management</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

11. Possible recommendations to improve the management of the warehouse operation?

i. ...........................................................................................................

ii. ...............................................................................................................