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Department of Information and Decision Science

KNUST School of Business

An assessment of the outsourcing of the transportation function of cocoa buying companies in Ghana, case study of Olam Ghana –Cocoa division

BY

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AN ASSESSMENT OF THE OUTSOURCING OF THE TRANSPORTATION FUNCTION OF COCOA BUYING COMPANIES IN GHANA, CASE STUDY OF OLAM GHANA –COCOA DIVISION

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DECLARATION

I hereby declare that this thesis was prepared and submitted by me and to the best of my knowledge; it contains no material previously published by any person or group of persons which has been accepted for the award of any other degree in any of the Universities. I therefore accept sole responsibility for mistakes or errors in this work. Acknowledgement is however giving to the various references made.

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DEDICATION

I dedicate this project thesis to my first family; my sweet queen, Maame Ansaah (Suzzie) and my lovely daughter Naa Akaabie Fio .

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ABSTRACT

Cocoa is the back bone of the Ghanaian economy and hence everything about it is a matter of concern to the players in the industry in particular and the economy of Ghana as a whole. Transportation is one of the major operational cost of the cocoa buying companies. Outsourcing of an important function such as transportation is very paramount to the industry.

This study was designed to assess the outsourcing of transportation function of cocoa buying companies in Ghana. There has been a number of problems with regards to third party transport providers in these companies such as drivers not being reliable, longer transit time. This study sought to find out the reasons behind these problems. Again, the study was to find out whether these transporters are reliable and also to know the transport mode used for the shipment of cocoa to the port. It was also to ascertain the risk inherent in outsourcing of transportation function. Findings revealed that Licence Buying Companies (LBCs) who use third party transport do not have any model for selecting transporters which has made the exercise risky to operate. Since the district officers do not know port requirements for their various districts, the stocks are being piled up at the port thereby lengthening their cycle time. An Analytical Hierarchy Process (AHP) model has been recommended for selecting transporters and also the rehabilitation of the rail transport service to facilitate movement of stock to the port. Again, Port officials should come out with destination requirement for each district to prevent stock being piled up at the various ports. This would help the industry adopt a transportation model that would contribute to cost saving.

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LIST OF ABBREVIATIONS

LBC	Licence Buying Company
PBC	Produce Buying Company
TOP	Take Over Point
3PL	Third Party Logistics
JIT	Just In Time
AHP	Analytical Hierarchy Process
QCD	Quality Control Division
CMC	Cocoa Marketing Company
ZM	Zonal Manager
DO	District Officer
QCI	Quality Control Inspector

PC	Purchasing Clerks
WPO	Warehouse Port Officer
MT	Metric Tonne
GPHA	Ghana Port and Harbour Authority
ICCO	International Cocoa Organization

CHAPTER ONE

1.0 **Introduction**

Most organizations are now diving deeply into their core areas of operations while off- loading other functions considered non-core to third parties who have the capabilities and competencies to manage in order to achieve cost saving advantage. Outsourcing has been defined as "A contractual relationship between an external vendor and an enterprise in which the vendor assumes responsibility for one or more business functions of the enterprise" (White and James 1993).

In spite of the numerous benefits derived by organizations in outsourcing, there are also challenges facing them as they give out part of their operations to outside vendors. There is therefore the need to find out research whether transportation outsourcing enables cocoa buying companies in Ghana to achieve profitability objectives. An assessment of transportation outsourcing in the cocoa industry is worth studying considering the contributions made by the industry towards the development of the Ghanaian economy. It is also justifiable to assess the transportation outsourcing in the cocoa buying companies since it forms one of the major operational cost in the industry.

1.1 **Background**

The growth in outsourcing in recent years is partly the result of a general shift in business philosophy. Prior to the mid-1980s, many companies sought to acquire other companies and diversify their business interests in order to reduce risk. As more

companies discovered that there were limited advantages in running a large group of unrelated businesses, however, many began to divest subsidiaries and refocus their efforts on one or a few closely related areas of business. Companies tried to identify or develop a "core competence," a unique combination of experience and expertise that would provide a source of competitive advantage in a given industry. All aspects of the company's operations were aligned around the core competence, and any activities or functions that were not considered necessary to preserve it were then outsourced. Today, outsourcing is embraced by companies of all sizes. As analysts Tom Osmond (2000) commented in Employee Benefit News, "many companies have decided that transactional and administrative functions are neither core competencies nor value-added activities. In fact, some companies are putting themselves at risk as a result of using outdated technology and not complying with government regulations. Vendors, by focusing on administration as part of their business model, provide better service enforced by contracts and service-level agreements."(pg 43)

The cocoa buying companies in Ghana initially were using their own trucks for both primary and secondary evacuation until 1990s where they started the use of third party transport service. The use of company trucks for secondary freight to the port resulted in higher operational cost due to; maintenance cost, pilfering of fuel by drivers, use of company trucks for personal gains etc. Based on the above development, management of most Licence Buying Companies (LBCs) entered into third party haulage agreement for their secondary freight. Olam, an LBC, for instance, fully uses third party haulage whiles Produce Buying Company (PBC) , partly uses own haulage for their secondary evacuations.

Transportation outsourcing in the cocoa buying companies in Ghana has been a recent development. The LBCs realised the high maintenance cost on using their own trucks for cocoa evacuation which resulted from mishandling of the trucks by drivers and pilfering of vehicle parts. Reliance on company truck causes delays in the evacuation of stock from the up country to the Take over Point (TOP) or the port which impact on the cycle time and interest of the LBCs. It was also detected that some drivers have been syphoning petroleum and using the company trucks for their personal gains. For these and other strategic reasons, management of most LBCs outsourced their transportation functions.

This study explores the peculiar benefits and the challenges associated with the transportation outsourcing in the cocoa buying companies in Ghana. The findings will help the strategic decision makers improve on the processes involved in outsourcing of transportation and the selection of transport providers which together will reduce the risk and achievement of primary objective of profit maximisation.

1.2 Problem statement

Outsourcing of transportation in the cocoa industry over the years has been beneficial to most of the players in the industry. However, little has been done in terms of research in the area. According to Robert *et.al.* (2002), the key concerns surrounding the risks of outsourcing were loss of control, quality issues, and degradation of skills within the organization issues. One other problem confronting the evacuation of cocoa is the lack of reliability of the transporters that result in overstocking in their warehouses.

Outsourcing may also result into the possible loss of flexibility in reacting to changing business conditions, lack of internal and external customer focus and sharing cost savings. Delaying in the delivery of goods to its destination. Loss of internally generated talent is yet another problem associated with the outsourcing as it may hamper the growth of an employee by depriving them from the experience he would have gained by handling the business issue himself than by passing it over to some other external party. I would like to suggest to management of LBCs to use certain models in the selection of the transporters and also review the contract terms with them on annually bases in order to reduce the risk. Transportation model could also be used for cost saving.

In view of the identified problems, the researcher wants to assess the transportation outsourcing in the Cocoa industry in Ghana.

1.3 Research objectives

The objectives of this research are:

To explore /examine the nature of outsourcing of transportation function in the cocoa industry in Ghana. Also to identify the types of transport and the routes used with their associated respective risks. Again, to assess the reliability of the transporters. Finally to make recommendations to the best practices in transportation outsourcing

1.4 Justification of the study

The researcher hopes to offer recommendations in this study that will help decision making bodies at all levels to reduce the risk in transportation outsourcing in the cocoa buying companies. Again, the researcher will also make recommendations to Ghana Cocoa Board in particular and the government of Ghana on the possible routes and the appropriate types of transportation for cocoa evacuation to the various ports for effective cost savings. There is a saying in Ghana that "Ghana is cocoa and cocoa is Ghana". This literally means that the Ghanaian economy depends heavily on cocoa export for developmental projects and job opportunity especially for farmers. Also this study will add to knowledge people have researched and serve as reference for people researching into the same or related fields.

1.5 Methodology

The population for this study had been grouped into different categories and therefore different types of methods were used to collect the necessary information for the data. Questionnaires and interviews were used for the collection of data and the type of instrument was to the discretion of the researcher. Again, secondary data such as how transporters are selected were gathered.

1.6 Scope of the Study.

The researcher selected one cocoa buying company in Ghana, (Olam Ghana Ltd - Cocoa Division). The researcher was not interested in their volume of purchases, revenue, financial statement, entire strategic plans etc but the focus of this paper was on transportation outsourcing decision processes, selection of transport providers and selection of transport routes.

1.7 Limitation of the study

This research is to help organizations solve problems but the industry does not have enough data and information especially the destination requirement for each LBC to enable the researcher to use a transportation model. Also the researcher found it difficult to get in touch with the district and zonal officers at the upcountry since they are most at times on the field (bush). But this did not affect the validity of the date much.

1.8 Organization of the Study

This work is organised and structured into five chapters. Chapter one is the introduction and the review of the related literature on transportation outsourcing is the chapter two. Methodology and organizational profile form chapter three while chapter four is where a thorough analysis of data as well as discussion is done. The final and last chapter is the summary of the findings, recommendations and conclusion.

CHAPTER TWO

Literature Review

2.0 Introduction

This chapter is constituted by the literature or work people have done in my area of research

2.1 Concepts of Third – party logistics providers

A third-party logistics (3PL) provide or performs one or more of the logistics activities relating to the flow of product, information, and funds that could be performed by the firm itself. Traditionally, 3PLs focused on specific functions such as transportation, warehousing, and information technology within the supply chain. (Armstrong & Associates, Inc, 2001). Most 3PLs started out by focusing on one of the functions in the supply chain. For example, UPS started out as a small-package carrier. Schneider started out as a truck load carrier. Over the years, however, as the basic functions have become commoditized, 3PLs have expanded their range of services. There are still several customers that use 3PLs to perform a specific function. For example, Grainger (a manufacturer) handles most of the order-to delivery-cycle itself, except for outbound transportation, which is outsourced to UPS. UPS clearly increases the surplus in this case given the geographic distribution of Grainger's customer and the small order sizes. UPS has now expanded to include warehousing, information technology, international, and a variety of other services. Outsourcing can be undertaken to varying degrees, ranging from total outsourcing to

selective outsourcing. Total outsourcing may involve dismantling entire departments or divisions and transferring the employees, facilities, equipment, and complete responsibility for a product or function to an outside vendor. In contrast, selective outsourcing may target a single, time-consuming task within a department, such as transportation, preparing the payroll or manufacturing a minor component that can be handled more efficiently by an outside specialist.

2.2.0 Risks of using a third party

According to Choppra and Meindl, (2007) Firms must evaluate the following six risks when they move any function to a third party.

2.2.1 The broken process.

The biggest problems arise when a firm outsource supply chain functions simply because it has lost control of the process. Keep in mind that introducing a third party into a broken supply chain process only makes it worse and harder to control. The first step should be to get the process under control, then do a cost-benefit analysis, and only then decide on outsourcing.

2.2.2 Underestimation of the cost of coordination.

A common mistake when outsourcing is to underestimate the effort required to coordinate activities across multiple entities performing supply chain tasks. This is

especially true if a firm plans to outsource specific supply chain functions to different third parties. Outsourcing functions to many third parties is feasible (and can be very effective) if the firm views being a coordinator as one of its core strengths. A good example of a strong coordinator is Cisco. However, even Cisco ran into trouble in the early 2000s and was left with a lot of surplus inventory because of coordination problems. An examples where coordination caused problems was between Nike and i2 Technologies in 2000. Nike blamed its loss of $100 million on inventory management glitches that it attributed to the supply chain planning software from i2. i2 in turn blamed the problems on Nike's execution of the software. Clearly, insufficient coordination between the two firms played a role in this failure.

2.2.3. Reduced customer/supplier contact.

A firm may lose customer/supplier contact by introducing an intermediary. The loss of customer contact is particularly significant for firms that sell directly to consumers but decide to use a third party to either collect incoming orders or deliver outgoing product. A good example is Boise Cascade, which outsourced all its outbound distribution to third parties. This led to a significant loss of customer contact. Boise Cascade decided to bring outbound delivery for customers located close to their distribution centers in-house. Given the high density of customers around their distribution centers, the additional gain in surplus that a third party could provide was minimal, while the gain from improved customer contact was significant. Boise Cascade did not bring distribution beyond this point in-house because the gain in surplus provided by a third party was significant (Choppra, 2003).

2.2.4. Loss of internal capability and growth in third-party power.

A firm may choose to keep a supply chain function in-house if outsourcing will significantly increase the third party's power. An example can be found in the electronics industry. Companies such s HP and Motorola have move most of their manufacturing to contact manufacturers but are reluctant to move either procurement or design, even though contract manufacturers have developed both capabilities. Given the commonality of components, its can be argued that a contract manufacturer can achieve a higher level of aggregation in procurement as well as design assets. HP and Motorola, however, are reluctant to move procurement to contract manufacturers because the potential loss in power is large whereas the aggregation gains are small given the relatively large size of both firms.

Keeping part of a supply chain function in-house is also important if a complete loss of capability significantly strengthens the third party's bargaining position. The in-house capability then serves as an option that can be exercised when the need arises. The option also limits how much of the supply chain surplus the third party can keep for itself.

2.2.5. Leakage of sensitive data and information.

Using a third party requires a firm to share demand information and in some cases intellectual property. If the third party also serves competitors, there is always the danger of leakage. Firms have often insisted on firewalls within the third party, but a firewall increases the specificity of assets, limiting the growth in surplus that the third

party can provide. When leakage is an issue, especially with regard to intellectual property, firms often choose to keep the function in-house.

2.2.6. Ineffective contracts.

Finally, choppra (2003) reiterated that Contracts with performance metrics that distort the third party's incentives significantly reduce any gains from outsourcing. For example, cost-plus pricing of third-party services presents incentive problems even if the third party opens its books. This form of pricing eliminates incentives for the third party to innovate further to reduce costs. . The onus for improvement falls back on the firm. Another example is when firms require suppliers or distributors to maintain a certain number of days of inventory as part of the contract such a contact reduce the third part's incentive to take actions that reduce inventories. In such a situation it is better for the firm to contract on a desired service level and leave the third party more freedom with regard to the amount of inventory. The third party then has an incentive to work on reducing the inventory required to provide a given level of service.

2.3.0 How third parties increase the supply chain surplus

Choppra and Meindl, (2007) suggested ten aggregation points on how third parties increase the supply chain surplus if they either increase value for the customer or decrease the supply chain cost relative to a firm performing the task in-house. These are; capacity, inventory, transportation by transportation intermediaries,

transportation by storage, warehouse, procurement, information, receivables, lower cost and higher quality aggregations

Third parties can increase the supply chain surplus effectively if they are able to aggregate supply chain assets or flows to a higher level than a firm itself. We discuss various mechanisms that third parties can use to grow the surplus. Talking on transportation aggregations, Choppra,(2007) said in transportation aggregation by transportation intermediaries, a third party may increase the surplus by aggregating the transportation function to a higher level than any shipper can on its own. UPS, FedEx, and a host of LTL carriers are example of transportation intermediaries that increase the supply chain surplus by aggregating transportation across a variety of shippers. The value provided in each case is driven by the inherent economies of scale in transportation. Also, Transportation aggregation by storage intermediaries. A third party that stores inventory can also increase the supply chain surplus by aggregating inbound and outbound transportation. For example, storage intermediaries such as W.W. Grainger and McMaster-Carr stock products from over a thousand manufacturers each and sell to hundreds of thousands of customers. On the inbound side they are able to aggregate shipments from several manufacturers onto a single truck.

2.4.0 Definition of outsourcing

Outsourcing has been defined as "A contractual relationship between an external vendor and an enterprise in which the vendor assumes responsibility for one or more business functions of the enterprise" (White and James 1993).

2.4.1 Advantages of outsourcing

Companies that decide to outsource do so for a number of reasons, all of which are based on realizing gains in business profitability and efficiency. Principal merits of outsourcing include the following:

2.4.2 Cost savings

Many businesses embrace outsourcing as a way to realize cost savings or better cost control over the outsourced function. Companies usually outsource to a vendor that specializes in a given function and performs that function more efficiently than the company could, simply by virtue of transaction volume. According to Roberts *et al* (2009), innovative outsourcing in logistics saves cost and they cite an example involving Hewlett-packard. Hewlett-Packard turned over its inbound raw materials warehousing in Vancouver, Washington, to Roadway Logistics.Roadways's 140 employees operate the warehouse 24 hours a day , seven days a week, coordinating the delivery of parts to the warehouse and managing storage. Hewlett-Packard's 250 employees were transferred to other company activities. Hewlet-Packard reports savings of 10% in warehousing operation costs.

2.4.3 Staffing levels.

Another common reason for outsourcing is to achieve headcount reductions or minimize the fluctuations in staffing that may occur due to changes in demand for a

product or service. Companies also outsource in order to reduce the workload on their employees (freeing them to take on additional moneymaking projects for the business), or to provide more development opportunities for their employees by freeing them from tedious tasks.

2.4.4 Focus.

Some companies outsource in order to eliminate distractions and force themselves to concentrate on their core competencies. This can be a particularly attractive benefit for start-up firms. Outsourcing can free the entrepreneur from tedious and time-consuming tasks, such as payroll, so that he or she can concentrate on the marketing and sales activities that are most essential to the firm's long-term growth and prosperity. "What an outsourcing partner really sells is focus," wrote Adam Katz-Stone, (2000) in *Baltimore Business Journal*. "In accounting for instance, that is something that typically is seen as necessary but not essential, not the core of the business. So you bring in an outsourcing partner and then you don't have to think about that any more. You can focus your energies on sales, marketing, all the other things that matter more."

2.4.5 Morale.

This is an often-overlooked but still notable benefit that can sometimes be gained by initiating an outsourcing relationship. "Often a business's lack of internal expertise or dedication to non-core tasks results in poor attitudes and ultimately poor

performance," wrote Grauman, (2000) in *CPA Journal*. "This can lead to overlap and duplication of internal efforts. An effectively designed and ongoing communication process emanating from one or more outsourcers can greatly reduce or eliminate these duplications."

2.4.5 Flexibility.

Still others outsource to achieve greater financial flexibility, since the sale of assets that formerly supported an outsourced function can improve a company's cash flow. A possible pitfall in this reasoning is that many vendors demand long-term contracts, which may reduce flexibility.

2.4.6 Knowledge

Some experts tout outsourcing of computer programming and other information technology functions as a way to gain access to new technology and outside expertise. This may be of particular benefit to small businesses, which may not be able to afford to hire computer experts or develop the in-house expertise to maintain high-level technology. When such tasks are outsourced, the small business gains access to new technology that can help it compete with larger companies.

2.4.7 Accountability.

Outsourcing is predicated on the understanding—shared by business and vendor alike—that such arrangements require quality service in exchange for payment. "Paying for a business service creates the expectation of performance," stated Grauman, (2000). "Outsourcers are well aware that this accountability is both practical and legal, with fiscal implications. The same cannot be said for internally provided functions."

Also a study by Leib (1992), the survey results also revealed a number of benefits experienced by companies using third party logistics providers, including: cost reduction, improved productivity and improved service. Finally, the study indicated that companies handled the displacement of personnel primarily through transfers to other positions within the company and terminations. In addition, a number of personnel were offered employment by the third party provider.

2.5 Disadvantages of outsourcing

By outsourcing a business process, you tend to loose the managerial control. This happens because it is harder to manage the outsourcing service provider as compare to managing one's own employees. Also because we generally tend to skip (or miss to calculate) the potential hidden costs of outsourcing which includes legal costs of putting together a contract between companies and time spent on coordinating the contracts, we feel that outsourcing reduces the overall expenditure of a business process, one of the major reasons why a company goes for outsourcing. This hidden

and missed out costs of outsourcing is hard to predict causing overall costs to be underestimated (Leib, 1992).

Another disadvantage is that outsourcing can also prove to be a threat to the security and confidentiality of issues of a company. If your company is outsourcing business process such as payroll, the outsourcing service provider will know confidential information such as salary. Therefore one must be very careful in choosing which business process to outsource and which one not.

Outsourcing may also result into the possible loss of flexibility in reacting to changing business conditions, lack of internal and external customer focus and sharing cost savings.

Again, *potential* disadvantages to outsourcing include poor quality control, decreased company loyalty, a lengthy bid process, and a loss of strategic alignment. All of these concerns can be addressed and minimized, however, by companies who go about the outsourcing process in an informed and deliberate fashion. *Info World*'s Maggie Biggs,(2000) counsels businesses to define "exactly what business processes and/or functions it makes sense to maintain via a service relationship. Unless you have a lot of resources to expend, it may make sense to prioritise outsourcing projects based on the number of benefits you expect to gain from the arrangement." There may also be inherent advantages of maintaining certain functions internally. For example, company employees may have a better understanding of the industry, and their vested interests may mean they are more likely to make decisions in accordance with the company's goals. Indeed, most analysts discourage companies from outsourcing core functions that directly affect the products or services that the business offers.

According to Jacobs, (2009), one of the drawbacks to outsourcing is the layoffs that often result. Even in cases where the outsourcing partner hires former employees, they are often hired back at lower wages with fewer benefits. According to them outsourcing is perceived by many unions as an effort to circumvent union contracts. Lieb (1992) also noted that the most prevalent implementation problem cited by the survey respondents was difficulty in convincing operating personnel and managers to "buy in" to the third-party service program.

2.6.0 Assessing Core Competencies

Most outsourcing decisions begin with an assessment of the role that the function in question plays in advancing the firm's core competencies, functions, or mission. The underlying logic is simple – any function the organization performs that is not essential to its mission, can, in theory, be outsourced. However, assessing a firm's core competencies is often an ambiguous and difficult task. In response to that challenge, current research on this phase of decision-making *recommends that firms simultaneously consider the functions that may benefit from outsourcing in conjunction with the core competencies of third parties that could potentially provide outsourced services* Copacino, (1994) . Again, the logic is simple – unless a qualified provider can be identified for a specific function, there may be no value added in considering an outsourcing plan for that function. Goldsmith, (1989) provided one of the first series of questions any firm should answer in this regard. What are the company's most significant considerations: Competitive position? Bottom-line cost? Inventory control? Do we have adequate manpower for these functions? Do we have

a knowledgeable staff, enough support, and third party help? Have we made current cost-benefit analysis of internal staffing versus outsourcing to accomplish our goals?

Using this sort of analysis, the initial task for management in assessing outsourcing needs is to identify areas where the firm can match its needs with the essential competencies of potential third-party providers. Copacino, (1994) presents a similar framework to help managers assess the impact outsourcing may have on operations at the strategic, structural, functional, and implementational levels. According to his framework, an outsourcing plan must include: an accurate definition of customer service , some knowledge on competitors, Institutional flexibility to incorporate a speedy response to future needs of the , existing or new customers . Thus, works of this sort clearly indicate the importance of identifying and connecting core competencies when making the decision to outsource.

2.7.0 Types of Transportation and their Routes

Wikipedea, the free encyclopaedia defines transportation as the movement of people and goods from one location to another. A transportation route is the regular path that is followed by a movement of people or goods. Ideally it follows the shortest possible distance—a straight line, or what is known on the curving surface of the Earth as a great circle. But natural barriers, such as intervening landmasses on ocean routes, often block such direct paths. (Britannica , 2007).

Transport is performed by various modes such as air, rail, road, water, cable, pipeline and space. The field can be divided into infrastructure, vehicles and operations.

Infrastructure consists of the fixed installations necessary for transport, and may be roads, railways, airways, waterways, canals and pipelines and terminals such as airport, railway, bus stations, warehouses, trucking terminals, refuelling depots (including fuelling docks and fuel station), and seaports Terminals may both be used for interchange of passengers and cargo, and for maintenance.

Vehicles travelling on these networks include vehicles of appropriate types such as automobiles, bicycles, buses, trains, trucks, people, helicopters, and aircraft. Operations deal with the way the vehicles are operated, and the procedures set for this purpose including financing, legalities and policies. In the transport industry, operations and ownership of infrastructure can be either public or private, depending on the country and mode.

Passenger transport may be public, where operators provide scheduled services, or private. Freight transport has become focused on containerisation, although bulk transport is used for large volumes of durable items. Transport plays an important part in economic growth and globalisation, but most types cause air pollution and use large amount of land. While it is heavily subsidized by governments, good planning of transport is essential to make traffic flow, and restrain urban sprawl (wikipedea).

Radioactive materials are carried by road, rail, sea, and air. There are strict regulations that cover each mode of transport, both at the national and the international level. Currently, all shipment campaigns that involve shipment of radioactive material in Type A containers or Type B casks are required to complete an environmental assessment. In high-visibility campaigns, like shipments to the Waste Isolation Pilot Plant or the proposed spent fuel shipments to Yucca Mountain, an

environmental impact statement is usually required. Shipments are routed according to U. S. Department of Transportation recommendations, although states may recommend alternate routes.

Choppra and Meindl (2007), also gave the following as modes of transportation and their performance characteristics; air, package carriers, truck, rail, water, pipeline, inter modal.

2.7.1 Air

Air carriers offer a very fast and fairly expensive mode of transportation. Small, high-value items or time-sensitive emergency shipment that has to travel a long distance a best suited for air transport. Air carriers normally move shipment under five hundred pounds, including high-value but light weight high-tech products. Given the growth in high technology the weight of freight carried by air has diminished over the last two decades even as the value of the freight has increased somewhat. In 2002, the goods US businesses moved by air were valued at $75,000 per ton, by far the highest among all modes.

The value of international trade moved by air to and from the United States grew significantly from $10 billion to $519 billion in 2001, growing at average annual rate of 14% per year. Key issues that air carriers face include identifying the location and number of hubs, assigning planes to routes, setting up maintenance schedules for planes, scheduling crews and managing prices and availability at different prices. Stock *et al* (2000) indicated that domestically, air carriers transport less than 1% of ton-mile traffic when product must be delivered to a distant location quickly, air

freight offers the shortest time-in-transit of any transportation mode. Air transport provides rapid time in transit but terminal and delivery delays and congestion may appreciably reduce some of this advantage.

2.7.2 Package carriers

According to Choppra and Meindl (2007) package carriers are transportation companies such as FedEx, UPS, US Postal Services which carries small packages ranging from letters to shipment weighing about 150 pounds. Package carriers use air, truck and rail to transport time critical smaller packages. Package carriers are expensive and cannot compete with LTL Carriers on price for large shipment. The major service they offer shippers is rapid and reliable delivery. Package carriers also pick up the package from the source and deliver it to the destination site. With an increase with just-in-time (JIT) deliveries and focus on inventory reduction, demand for package carriers have grown.

Package carriers are the preferred mode of transport for e-businesses such as Amazon.com and Dell as well as for companies such as W. W. Greianger and Mcmaster-Carr that send small packages to customers.

2.7.3 Truck

In 2002, trucks moved 64% of US commercial freight by value and 58% by weight. The trucking industry consists of two major segments – TL or LTL. Trucking is more expensive than rail but offers the advantage of door to door shipment and shorter

delivery time. It also has the advantage of requiring no transfer between pick up and delivery (Choppra and Meindl, 2007). Stock, (2000) states that, motor is more flexible and versatile than other transportation modes. The flexibility of motor carriers in the United Sates is made possible by a network of 4 million miles of roads which enables them to offer point to point service between almost any origin-destination combinations. The combination of flexibility and versatility of motor carriage has enabled it to become the dominant form of transport in the United States as well as in many other parts of the world.

2.7.4 Rail

In 2002, rail carried 4% of US shipment by value, 12% by weight and over 25% of total ton miles. These figures reflect the use of rail to move commodities over large distances. Rail carriers incur a high fixed cost in terms of rails, locomotives, cars and yards. Any idle type, once a train is powered is very expensive because labour and fuel cost are incurred even though trains are not moving. Transportation time by rail however can be long. Rail is thus ideal for very heavy low value shipment that are not very time sensitive (Choppra and Meindl, 2007). In many regions of the world such as Europe and China, rail is the dominant transportation mode. Railroads accounted for slightly over one-third of the intercity freight traffic in ton-miles. Rail service is available in almost every metropolitan centre in the world, and in many smaller communities as well. However, the rail network is not nearly as extensive as the high way network in most countries. Therefore, rail transport lacks the versatility and flexibility of motor carriers because it is limited to fixed truck facilities.

2.7.4 Water

In their book, Chopra and Meindl said within the US, water transport takes place via the inland waterway system or coastal waters. Water transport is ideally suited for carrying very large loads at low cost. Water transport is limited to certain areas. Within the US, water transport is used primarily for the movement of large bulk commodity shipments and is the cheapest mode for carrying such loads. In global trade, water transport is the dominant mode for shipping all kinds of products. Water transportation can be broken down into several categories according to (James R. Stock *et al* 2000). In 2001, merchandise trade valued at over $718 billion moved between US and foreign seaports. Maritime transportation accounted for 78% of the US international merchandise freight by weight in 2002.

2.7.5 Pipeline

Pipeline is used primarily for the transport of crude petroleum, refined petroleum products, and natural gas. In the United States, pipeline accounted for about 17% of total ton-miles in 2002. A significant initial fixed cost is incurred in setting up the pipeline and related infrastructure that does not vary significantly with the diameter of the pipeline. According to James R. Stock *et al,* slurry products, usually coal slurry, account for only a small percentage of pipeline shipments. The coal is ground into a powder, suspended n water, transported through a pipeline, and at destination is removed from the water and readied for use. They further stated that, the cost and the dependability advantages pipeline has over other transport modes has stimulated shipper interest in moving other products by pipeline. Certainly, if a product is or can

be in liquid, gas or slurry form it can be transported by pipeline. As the cost of other modes increase, shippers may give additional considerations to pipelines as a mode of transport for non-traditional product (James R. Stock *et al,* 2000).

2.7.6 Intermodal

Intermodal transportation is the use of more than mode of transport to move a shipment to its destination. A variety of intermodal combinations are possible, with the most common being truck/rail. Major intermodal providers with rail include CSX intermodal, pacer stacktrain, and triple crown. Containers are easy to transfer from one mode to another and their use facilitates intermodal transportation.

2.8 Modal choice

Modal choice depends on other factors that can be identified when the real and perceived strengths and weaknesses of the principal modes are considered.

Table 2.1 Modal choices

Mode	Strength	Weakness
Road	Door-to-door service Flexible High level of customer service	Congestion delays Environmental suspect Limited weight and volume
Rail	Efficient for bulk product Competitive over long distances Energy efficient	Inflexible Double-handing (freight must usually be transferred to road for final delivery)
Maritime	Efficient for bulk product High volumes and tonnages	Slow Double-handling
Inland Waterways	Energy efficient Cheap	Slow Double-handling
Air	Speed, especially over long distances High security	Very expensive Limited weight and volume

Source: (Chartered Institute of Logistics and Transportation, 2004)

2.9.0 Supplier selection

2.9.1 Carrier selection determinants

Coyle J. John et al (1992) stated the criteria firms used in carrier selection. What, then, are the criteria firms use to evaluate the alternative modes and carriers? According to the carrier selection literature, the salient selection determinants are carrier costs and service performance. The relevant service performance determinants are transit time, reliability, capability, accessibility, and security. We will now discuss how carrier cost and service determinants interact in the firms' logistics function.

2.9.1.0 Transportation Cost

Transportation cost was the predominant carrier selection determinant in early carrier selection works. The transportation cost includes the minimum weights, loading and unloading facilities, packaging and damage in transit, and special services available from a carrier-for example locking stopping in transit. Transportation cost analysis is oriented toward evaluating alternative modes since the rates, minimum weights, loading and unloading facility, packaging, and blocking will vary from one mode to another. However, the importance of transportation costs receded somewhat with the advent of the business logistics concept, which now focuses attention upon the cost trade-offs existing between the service a carrier provides and nodal operation costs. Even so, the transportation cost disparities prevalent in today's deregulated environment remain an important criterion in the carrier selection decision (Coyle, 1992).

2.9.1.1 Transit time

Transit time is the total time that elapses from the time the consignor makes and reliability the goods available for dispatch until the carrier delivers same to the consignee. This includes the time required for pickup and delivery, for terminal handling, and for movement between origin and destination terminals.

2.9.1.2 Reliability

Reliability refers to the consistency of the transit time a carrier (the link Supplier) provides. Inventory and Transit time and reliability affect the nodal costs of inventory and stockouts . stockout costs (Lost sales or forgone productivity). Lower transit times result in lower inventories, while more dependability causes lower inventory levels or stockout costs. With a given level of lead time, a firm can minimize inventories at a node and consequently inventory carrying costs. But, if the transit time is not consistent transit time would require. More specifically, the node now must hold larger amounts of inventory as a safety factor against stock outs that could arise from inconsistent link service. Product differentiation. The marketing implication of reliable transit time is product differentiation and a competitive advantage in the marketplace. Thus, if your firm can provide a customer with a lower and more dependable transit time than your competitor, the customer can reduce inventory or stock out costs and your firm can increase sales. Sales are quite sensitive to consistent service, and the logistics manager must concentrate on carrier transit time and reliability to differentiate a firm's product in the marketplace (Coyle, 1992).

2.9.1.3 Capability and Accessibility

Capability and accessibility determine whether a particular carrier can physically perform the transport service desired over a link. Capability refers to the carrier's ability to provide the equipment that facilitates the movement of a particular commodity requires. Equipment that can provide controlled temperatures or humidity and special handling facilities are examples of capability factors. Accessibility considers the carrier's ability to provide service over the link in question–that is, the availability of carrier routes and terminals in shipping location proximities. Accessibility refers to a carrier's physical access to the nodes. The geographic limits of a carrier's route network (rail lines or waterways) and the operating scope regulatory agencies authorize constrain a carrier's accessibility. A carrier's inability to provide the desired capability and availability service requirements can eliminate the carrier from consideration in the carrier selection decision.

2.9.1.4 Security.

Security concerns the arrival of goods in the same condition they were in when tendered to the carrier. Although the common carrier is held liable for all loss and damage, with limited exceptions, the firm does incur nodal costs when the carrier loses goods or delivers them in a damaged condition. Unsafe link service results in opportunity costs of forgone profits or productivity because the goods are not available for sale or use. To guard against these opportunity costs, a firm will increase inventory levels, with resulting increased inventory costs. The continued use of an

unsafe carrier will adversely affect customer satisfaction and, consequently, sales (Coyle,1992).

A firm using a common carrier holds the carrier liable for damage to the lading. To recover the damage value, the shipping firm must file a claim with the carrier. This entails a claim preparation and documentation cost, as well as legal fees if the firm has the claim settled through the courts. Therefore, frequent damage to the commodities also aggravates the nodal cost associated with claim settlement. A second study developed from a survey of third party service users in the United States identified three major selection criteria for selecting third party (3PLs) service providers. In this study, Menon, *et.al* (1998) identified the first selection criterion as the perceived performance of the supplier. The perceived performance includes the perception of on-time performance, the ability to meet promises, the availability of top management, and excellent error rates. The second criterion, perceived capability, is comprised of the perception of creative management and financial stability of the provider. The third criterion identified was the role of prices; however, the study suggested that performance and quality requirements outweigh price considerations.

In a third study based on survey results, Lieb, (1992) identified an almost even division between cost and service considerations as most important for selecting a third party service provider. Other considerations for selecting a provider that were identified in the study include prior experience with the third party, management capability, company reputation, and financial stability.

2.10.0 Analytical Hierarchy Process (AHP): Model

According to Russel and Tailor, (2003) AHP is " a quantitative method for ranking decision alternatives and selecting the best one given multiple criteria". It answers the question, "Which one?" The decision maker will select the alternative that best meets his or her criteria. AHP is a process for developing a numerical score to rank each decision alternative based on how well each alternative meets the decision maker's criteria.

We will demonstrate how AHP can be used by a company to select a company's supplier, although it can also be used to select transportation carriers and distributors and to locate a facility. Possible criteria that a company might consider when selecting a supplier are product cost, quality, service, and delivery. The mathematical process used in AHP is to first establish preferences for each supplier for each criterion. For example, the company might first decide that supplier A is better than supplier B based on product cost. Then the company might decide they prefer B to supplier C based on product quality and so on. Next the company would mathematical determine their preferences for the criteria-that is, which of the criteria is most important, which is the next most important, and so on. For example, it might decide that cost is more important than quality. Finally, these two sets of preferences are mathematically combined – for suppliers for each criterion and for the different criteria-and a score derived for each supplier, with the highest score being the best.

In AHP, preferences between alternatives are determined by making pair wise comparisons. In a pair wise comparison the decision maker examines two alternatives according to one criterion and indicates a preference. For example, a company might compare supplier A with supplier B and decide which one is preference scale, which

assigns numerical values to different levels of preference. This scale has been determined by experienced researchers in AHP to be a reasonable basis for comparing two alternatives. Each rating on the scale is based on a comparison of two items. For example, if a company moderately prefers supplier A to supplier B, then a value of 3 is assigned to this particular comparison, and 3 is a measure of the company's preference for supplier A to B. the company's preference value of supplier B to A is simply the reciprocal (or inverse) of its preference for A to B, in this case, 1/3.

PREFERENCE LEVEL	NUMERICAL VALUE
Equally preferred	1
Equally to moderately preferred	2
Moderately preferred	3
Moderately to strongly preferred	4
Strongly preferred	5
Strongly to very strongly preferred	6
Very strongly preferred	7
Very strongly to extremely preferred	8
Extremely preferred	9

Source: (Russel and Taylor, 2003)

ANALYTICAL HIIEARCHY PROCESS

In the quest to further explain the AHP, Russel and Taylor gave the following illustration; The Southcorp is selecting among suppliers A, B, and C. The company wants to use AHP to help it decide which supplier to select. The criteria on which Southcorp will base their decision are the product cost, product quality, service, and delivery.

Southcorp's pairwise comparison ratings for each supplier of the four criterion are summarized in the following matrices:

COST				DELIVERY				QUALITY				SERVICE			
	A	B	C		A	B	C		A	B	C		A	B	C
A	1	3	2	A	1	6	1/3	A	1	1/3	1	A	1	1/3	½
B	1/3	1	1/5	B	1/6	1	1/9	B	3	1	7	B	3	1	4
C	½	5	1	C	3	9	1	C	1	1/7	1	C	2	¼	1

Source: (Russel and Taylor, 2003)

For example, the "cost "matrix indicates that supplier A is "equally to moderately preferred" to supplier C, but supplier C is "strongly preferred" to supplier B. Notice that any supplier compared to itself, most be "equally preferred" with a value of 1, which makes the values along the matrix diagonal all equal to 1.

The next step in AHP is to prioritize the suppliers within each criterion. This means the company wants to determine which is the most preferred supplier, the second most preferred supplier, and the third most preferred supplier within each of the four

criteria. This step, referred to as "synthesisation", is mathematically complex, but we can employ an approximation method that provides a reasonably good estimate of preference scores. The first step is to sum the value in each column of the pairwise comparison matrix, as shown here for our cost matrix.

	COST		
SUPPLIER	A	B	C
A	1	3	2
B	1/3	1	1/5
C	1/ 2	5	1
	11/6	9	16/5

Next the values in each column are divided by the corresponding column sums, as follows:

	COST		
SUPPLIER	A	B	C
A	6/11	3/9	5/8
B	2/11	1/9	1/16
C	3/11	5/9	5/16
	1	1	1

Notice that the values in each column sum to 1. Next the values in each row are averaged, as shown in the following table. (At this point we have converted the fractional values to decimals):

SUPPLIER	A	B	C	Row Average
A	0.5455	0.3333	0.6250	0.5012
B	0.1818	0.1111	0.0625	0.1185
C	0.2727	0.5556	0.3125	0.3803
				1.0000

These row average provide the company with their preference for each criterion, summarized in the following matrix. For example, for the cost criterion supplier A is the most preferred, followed by supplier C, then supplier B.

	CRITERIA			
SUPPLIER	Cost	Quality	Service	Delivery
A	0.5012	0.2819	0.1790	0.1561
B	0.1185	0.0598	0.6850	0.6196
C	0.3803	0.6583	0.1360	0.2243

The next step in AHP is to rank the criteria in order of importance. This is accomplished in the same way the suppliers were ranked within each criterion previously, by using pair wise comparisons. This following matrix shows the pair wise comparisons for the four criteria.

CRITERIA	COST	QUALITY	SERVICE	DELIVERY
Cost	1	1/5	3	4
Quality	5	1	9	7
Service	1/3	1/9	1	2
Delivery	¼	1/7	½	1

Next values in each in this matrix are summed, then the column values are divided by their corresponding column sums and the rows are averaged, resulting in the following matrix:

CRITERIA	COST	QUALITY	SERVICE	DELIVERY	R. AVERAGES
Cost	0.1519	0.1375	0.2222	0.2857	0.1993
Quality	0.7595	0.6878	0.6667	0.5000	0.6535
Service	0.0506	0.0764	0.0741	0.1429	0.0860
Delivery	0.0380	0.0983	0.0370	0.0714	0.0612
					1.0000

The preference vector for the criteria consists of the row averages:

	CRITERIA
Cost	0.1993
Quality	0.6535
Service	0.0860
Delivery	0.0612

Clearly product quality is the most important criterion, with cost second. An overall score for each supplier is computed by multiplying the matrix summarizing the company's preference for each supplier for each criterion we developed previously by the preference vector for the four criteria above:

CRITERIA	Cost	Quality	Service	Delivery			
A	0.5012	0.2819	0.1790	0.156		Cost	0.1993
B	0.1185	0.0598	0.6850	0.6196	*	Quality	0.6535
C	0.3803	0.6583	0.1360	0.2243		Service	0.0860
						Delivery	0.0612

Supplier A score = 0.1993 (0.5012) + 0.6535(0.2819) + 0.0860(0.1790) + 0.0612(0.1561) = 0.3091.

Supplier B score = 0.1993 (0.1185) + 0.6535(0.0598) + 0.0860(0.6850) + 0.0612(0.6196) = 0.1585.

Supplier C score = 0.1993(0.3803) + 0.6535(0.6583) + 0.0860(0.1360) + 0.0612(0.2243) = 0.5314

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The three suppliers in order of the magnitude of their scores are summarized as follows:

SUPPLIER	SCORE
C	0.5314
A	0.3091
B	0.1595
	1.0000

Based on these scores, supplier C should be selected. In order to rely on this result the company must have confidence in the judgments made in developing the pair wise comparisons. However, even if the company does not make its selection based on the AHP result, following this process can help identify and prioritise the criteria and identify the strengths and weaknesses of the different suppliers.

2.11 .0 The transportation model

From my lecture notes, (2008/9) on transportation model, the lecturer, stated that certain problems are more easily handled by linear programming model either than the simpliest distribution model, is widely used to solve problems including the shipping of goods from various sources to various destinations.

Actually, this model is valuable in many different types of problems in which limited resources must be utilised to satisfy a known requirement or demand at minimum cost. If this model is to be usable, the available resources must be capable of being expressed in the same units of measure generally, any problem that can be solved by the distribution model can also be solved by the simplest method. Examples of other types of problems that fit the distribution model format are:

- Machine assignment problems
- Production-routing problems
- Scheduling problems
- Certain types of personnel assignment problems

2.11.1 Characteristics of transportation problems

I. A finite and homogenous set of discrete unit must be shifted from several sources to several destinations in a particular time period.

II. Each source has a precise number of units that must be shipped in the time period.

III. Each destination has a precise number of unit that must be received in the time period.

IV. Each discrete unit to be shipped has a specific transportation cost from each source to each destination.

V. The objective is to minimise the total transportation cost for the time period.

VI. The decision variables represent the number of units to be shipped from each source to each destination

2.13.0 The Cocoa Industry in Ghana.

Since 1994/5 Ghana has been the second largest producer of Cocoa in the world. The largest being the neighbouring Cote d'Ivoire. The table below gives the share of Ghana in the world over the last decade (all production in OOOMT).

Table 2.2 Ghana's cocoa market share in the world

YEAR	WORLD	GHANA	% SHARE
1989/90	2406.6	295.1	12.3
1990/91	2505.8	293.4	11.7
1991/92	2277.9	242.8	10.7
1992/93	2484.5	312.1	12.6
1993/94	2435.4	254.7	10.5
1994/95	2348.0	309.5	13.2
1995/96	2916.0	403.9	13.9
1996/97	2712.8	322.5	11.9
1997/98	2675.1	409.4	15.3
1998/99	2760.1 (est.)	397.0	14.3

Source: (International Cocoa Organisation, 2000)

The Ghanaian crop is divided into two seasons –the Light crop (LC), which extends from mid May to end July and accounts for 35-40,000 MT, and the Main crop (MC)which extends from mid September to March end and for 350-400 , 000MT.

The government, through the Ghana Cocoa board (COCOBOD), controls the Cocoa industry. The COCOBOD, through its various arms – PBC or Produce Buying Company (responsible for buying Cocoa from the farmers) the QCD or Quality Control Division (sole agency responsible for the grading of Ghana Cocoa), the CMC or Cocoa Marketing Company (responsible for selling the Ghana Cocoa in the world market)- oversees all aspects of the Ghanaian cocoa industry (Cocobod, 2004).

Until 1992/93 COCOBOD had a monopoly over Cocoa purchase through PBC . In 1992/93 private companies were allowed to participate in primary procurement of Cocoa. Any company wanting to operate in the Cocoa sector must apply to the COCOBOD for a license. On successful obtaining of the license, the company, henceforth called a Licence Buying Company or LBC, can then participate in the purchase of Cocoa beans from the farmers and is obligated to sell its entire purchase back to the COCOBOD. The price paid to the farmers and the resale price to the COCOBOD, is fixed at the beginning of each season by the COCOBOD. Currently, the market is dominated by PBC, Adwumapa, Olam, Armajaro (AGL), Akuaffo Adamfo (AAMC) appa. The following table gives the market share movement of these companies over the last five years.

Table 2.3 Procurement movement of the LBCs

	98-99	99-00	00-01	01-02	02-03
PBC	231,280	175,443	129,393	130,000	150,000
CASHPRO	59,732	55,611	42,286	-	-
ADWUMAPA	27,318	28,450	33,686	32,600	50,000
KUAPA	21,053	26,494	30,968	32,500	37,000
FEDCO	32,262	37,868	34,630	32,700	37,000
TGL	6,115	18,934	20,411	19,700	27,000
CMG	6,033	19,049	16,457	13,500	16,000
AAMC	-	-	-	6,000	33,000
OLAM	1,121	18,726	20,426	31,500	51,000
AGL	-	-	-	6,000	35,500
OTHERS	12,497	26,749	23,500	10,000	13,500
TOTAL	397,311	407,324	351,757	314,500	450,000

Source: Cocoboard (Figures in MT)

The Cocoa industry in Ghana is at a crossroads today. Ghana is moving towards liberalizing its Cocoa sector. Those LBCs who have bought at least 10,000MT over the last two years will be allowed to export procurement . The exact modalities of the export procedure are yet to be finalized (COCOBOD Annual Report, 2004)

CHAPTER THREE

Research methodology

3.0 Introduction

The chapter three of this research which is methodology includes the study area, population, sampling techniques, data collection methods and the profile of Olam Ghana ltd.

3.1 Study area

Olam Ghana is a company dealing in different kinds of businesses such as rice , tomato paste, coffee ,cocoa among other things. However, with respect to this study, collection of data and or survey was strictly focused on their cocoa buying division whereby forty-six (46) of their zonal managers (ZM's) and District Officers (DO's) randomly selected within the cocoa growing areas in the Western region. The Western Region is divided into two branches; western north with the branch office at sefwi Wiaso (NorCC) and western south with the branch office at Dunkwa (SouthCC) each headed by a branch manager. An interview was granted to the western south branch manager on their decision making on transportation outsourcing and the subsequent selection of the transporters.

3.2 Study population

With respect to this study, all questionnaires that were administered to the forty-six randomly selected zonal managers and DO'S in the cocoa growing areas in the

Western south were observed and analysed. However, that which were studied were randomly selected out of the total population of ZM's and DO's in the Cocoa buying companies.

3.3 Sampling

Since all the cocoa buying companies can not be used, a strategy will therefore be used to select the required number as the sample size. One out of twenty LBCs was selected and forty-six of their staff were used in the sample selection. This means, stratified simple random sampling were adopted to select the sample size of one LBC out of a lot.

3.4 Sources of data

For the purposes of this study, primary and secondary data were used in making the study comprehensive. The questionnaires were of two types: one for zonal managers and DO'S and another type for the transporters/drivers . The respondents were required to answer open ended and closed ended questions.

3.5 Data Analysis and Techniques

There are different data analyses that are applicable for research activities. However, this research will be analysed using SPSS software programme.

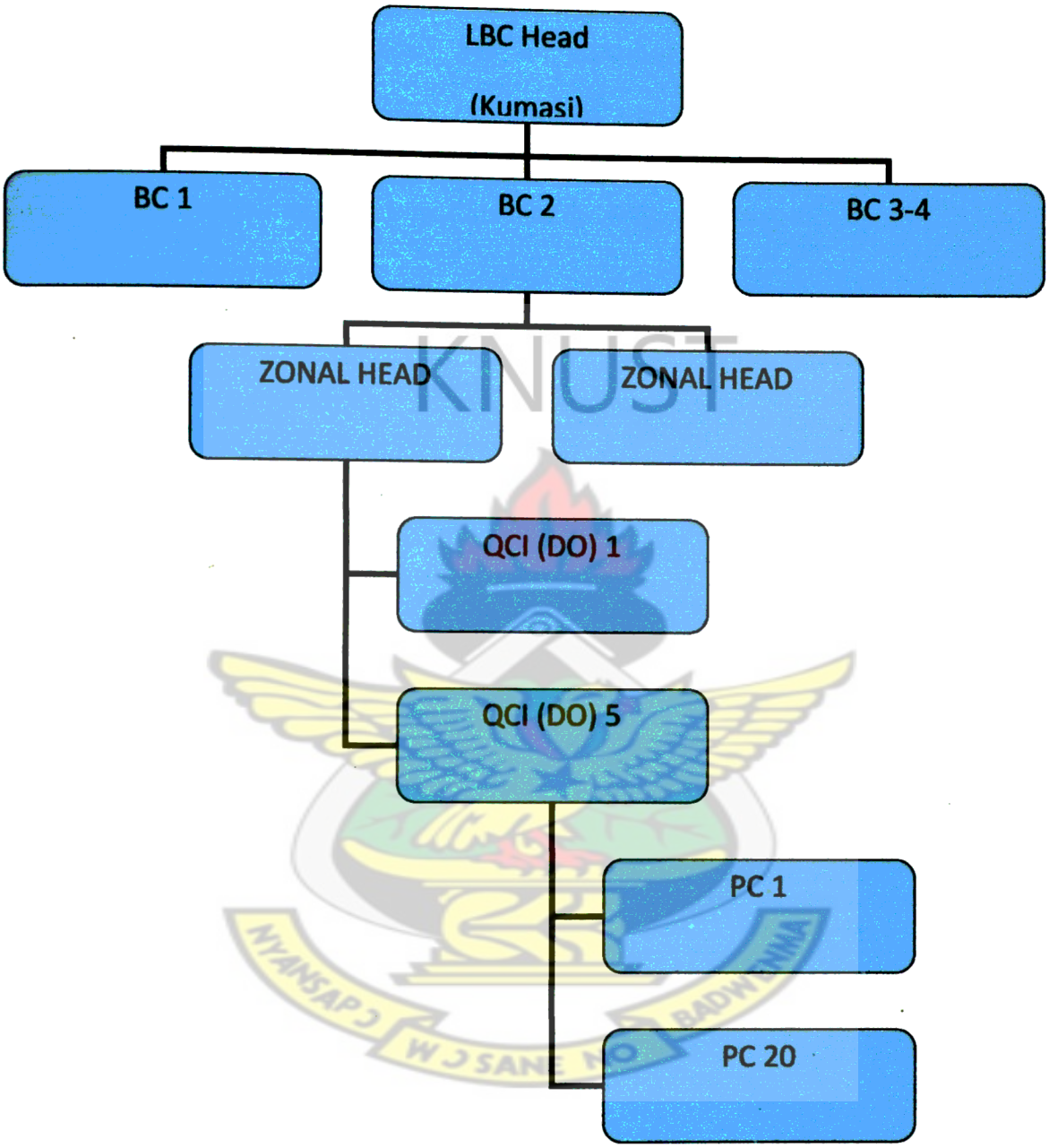
3.6.0 Organization profile

3.6.1 Brief history of Olam Company

Olam, a multinational company was established in 1988, operating in about fifty-six countries including Ghana. Currently the company has about fourteen lines of products which includes cocoa, coffee, shear butter, timber, rice, tomatoes, biscuit, cooking oil, etc. The company has its headquarters in Singapore but cocoa operational headquarters' is in London.

Olam has existed in Ghana since 1994, six years after its establishment. It is operating in about ten different products such as cocoa , coffee, shear butter , tomatoes, biscuits, vegetable oil etc. Olam Ghana has its head office in Accra, the capital city of the country. Due to its lines of products each product has a head. The cocoa division has LBC head whose operational office is situated in Kumasi but reports to the country head in Accra as well as cocoa headquarters' in London. Cocoa operations are basically in the rural areas. Below is the organisational chart for cocoa divsion

3.6.1 Organisational chart for Olam Ghana –Cocoa division

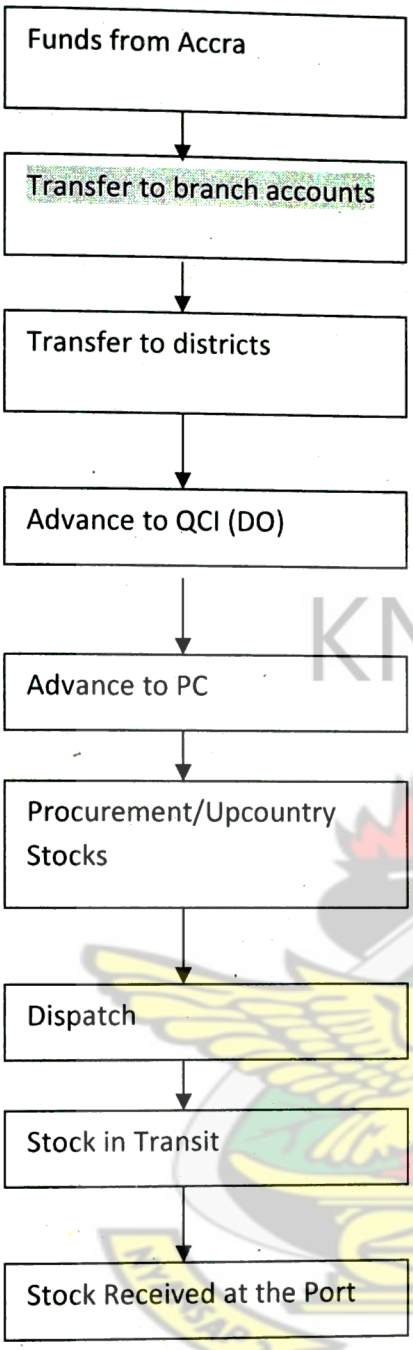


Source: (Olam cocoa division, 2007)

Each BC is responsible for 2-3 Zonal Heads. Each Zonal Head is responsible for 7-8 QCI (Olam called their Dos as QCIs); and each QCI is responsible for 15-25 PCs. PC (Purchasing Clerk) are commission agents that buy for Olam at the village level.

Thus, the buying network is geographically spread-out and characterized by multiple buying points (each PC location is a buying point). The assets (scales, tarpaulins, sieves, tallies) are supplied to selected PCs. The physical difference between the central decision maker (Kumasi) and an executor (QCI/PC) necessitates the standardization of basic procedures.

We can breakdown the upcountry module into the following stages:



Source: (Olam cocoa division, 2007)

3.6.1 Olam Operations

Olam was granted the LBC status on 24th Dec '98. We bought 1,100 MT in the crop year 98-99 (800 in 98-99 MC and another 300 MT in 99 LC). The 99/00 was the first full-scale season for OLAM Ghana in which we bought 20,000 MT (18,700 + 1,300).

The second year of operation (00-01) saw the volume grow to 23,300 MT (20,500 + 2800). The outlook for 01/02 is 40,000MT.

3.6.2 The Buying Structure

For the purpose of control the country is divided into various branches, each managed by a Branch Co-ordinator or Branch manager 1 (the Branch Co-ordinator report to the PCH at Accra). Under each branch are various zones, managed by a Zonal Head. Under each zone are various districts. Each district is a buying area managed by a Quality Control **Inspector or QCI2.** Under each QCI are 10-15 Purchasing Clerks or *PC*. The PC is a commission agent that operates in a specific village(s) called **societies** and collect Cocoa from the farmers of that area. Currently we have 470 PCs spread across 37 districts. Annexure E shows the cocoa production areas of Ghana and the market share of OLAM in each area.

3.6.2 The Buying System

The PCs are advanced monies by the QCIs for purchase of Cocoa. The advances are made either through cheques or cash, and accordingly a Bank Voucher or a Cash Voucher is made and an entry is made on the debit side of the *PC ledger*. The PC then goes back to his society and buys the Cocoa from the farmers at a fixed price/kilo. The PC checks the Cocoa beans for dryness and in case the beans are not thoroughly dried, he dries them. The dried beans are then sieved to segregate beans of different sizes and also to remove any admixture. The small size beans are rejected and the

large beans are bagged in jute sacs (the PC supplies us with 63-kg/bag net weight of Cocoa beans). The jute sacs are then evacuated to the district warehouse. This is called primary evacuation. In the warehouse the depot keeper prepares a Warehouse Receipt, a copy of which is handed over to the PC to acknowledge delivery of the jute sacs and makes an entry into his Warehouse Ledger.

3.6.3 Grading and Sealing

The QCD does grading and sealing of Cocoa only at QCD approved company depots. Thus, prior to the beginning of the season all the depots are inspected by the QCD and an approval certificate obtained. This is on display in each of the depots.

The QCD grades Cocoa in batches of 15 bags, stacked in two columns of 7 bags each and 1 bag on top straddling the two columns. The picture below shows a stack of 10 bags graded bags.

Firstly, the grader checks the moisture content of the Cocoa beans. He does this with the help of an instrument called Aquabouy. It is a meter to which two metal probes are attached. These probes are dug into the jute sac, touching the beans. The meter then indicates the moisture content in percentage. The acceptable moisture level is under 8%. Any bag having a moisture level of over 8% is called *NTD* (Not-Thoroughly-Dried) and rejected (these bags are then dried at the depot and re-applied for grading at a later date).

3.6.5 Truck arrival

After the truck comes, the port officer of the LBC takes the waybill brought by the truck driver from the sending depot. This waybill is called as External Waybill or Siding Depot Waybill. Based on this waybill he has to raise an Internal Waybill. The original copy of External Waybill along with original copy of Internal Waybill and its four carbon copies has to be submitted at the port for offloading the truck.

3.6.6 Truck offloading

At the offloading point CMC Audit, CMC WPO, GPHA, Security and QCD reps are present. Audit, WPO and GPHA reps are responsible for weight certification and QCD rep for quality certification. Security is for ensuring that no theft takes place. After the cocoa has been offloaded from the truck without any rejection by both the CMC and QCD, the driver receives a "pass note" and subsequently leaves the offloading

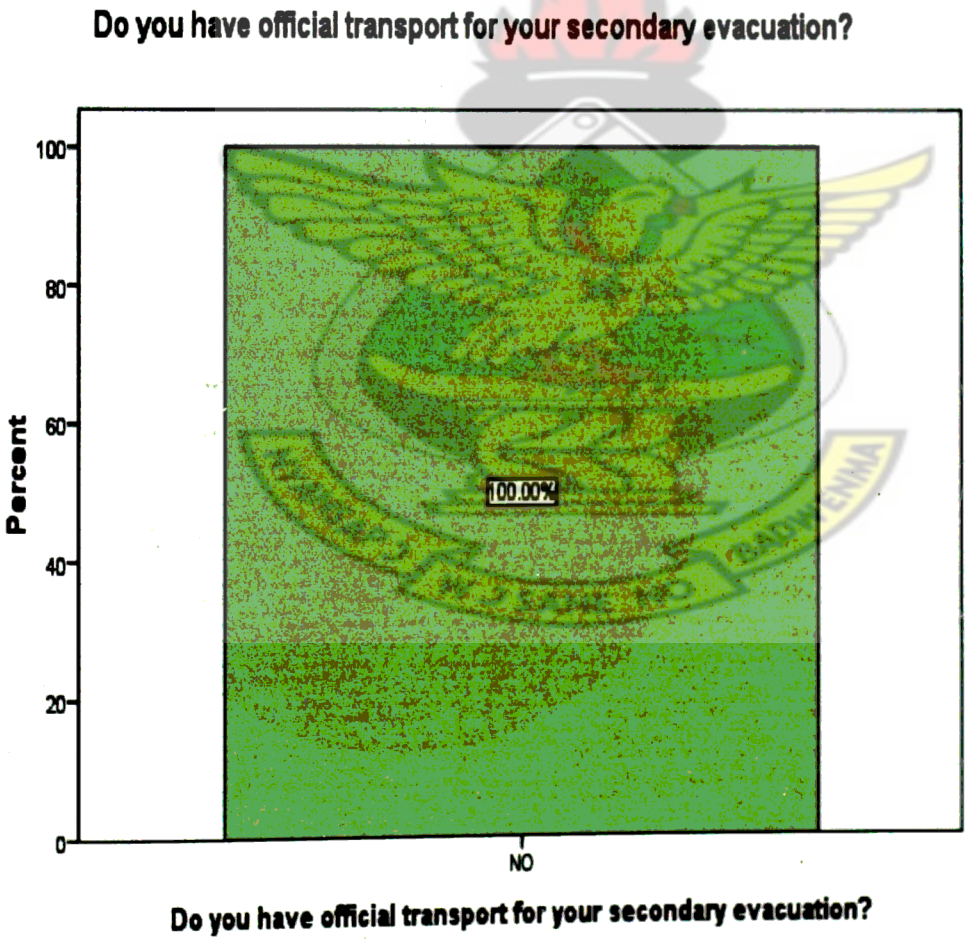
CHAPTER FOUR

Data Analysis and Interpretations

4.0 Introduction

This chapter elaborates on the findings of the study. The coded findings were run by 16.0 version of SPSS software programme for proper analysis. The full result of the data were analysed based on the researcher's assessment and judgement.

The analysis of the study covered a total of 47 respondents who answered the questions . This includes 40 Dos and ZMs and 7 transporters/drivers.

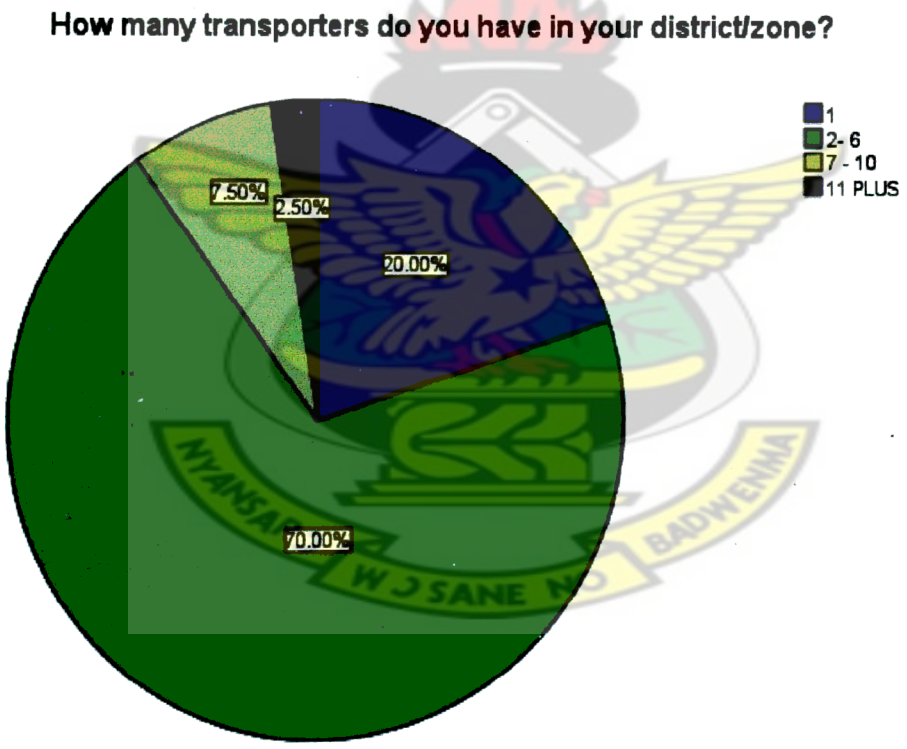


Source: (Authors field survey July, 2009)

Figure 4. 1 Official transport for secondary evacuation

A question was thrown to DOs and ZMs on how they ship their cocoa to the Take Over Point (TOP), that is either by the company's own trucks or third party transport and according to the above statistics, all the respondent answered no . This means that Olam as a cocoa buying company in Ghana wholly uses third party transportation for their secondary evacuation. Total outsourcing may involve dismantling entire departments or divisions and transferring the employees, facilities, equipment, and complete responsibility for a product or function to an outside vendor

figure 4.2: How many transporters do you have in your district/zone?

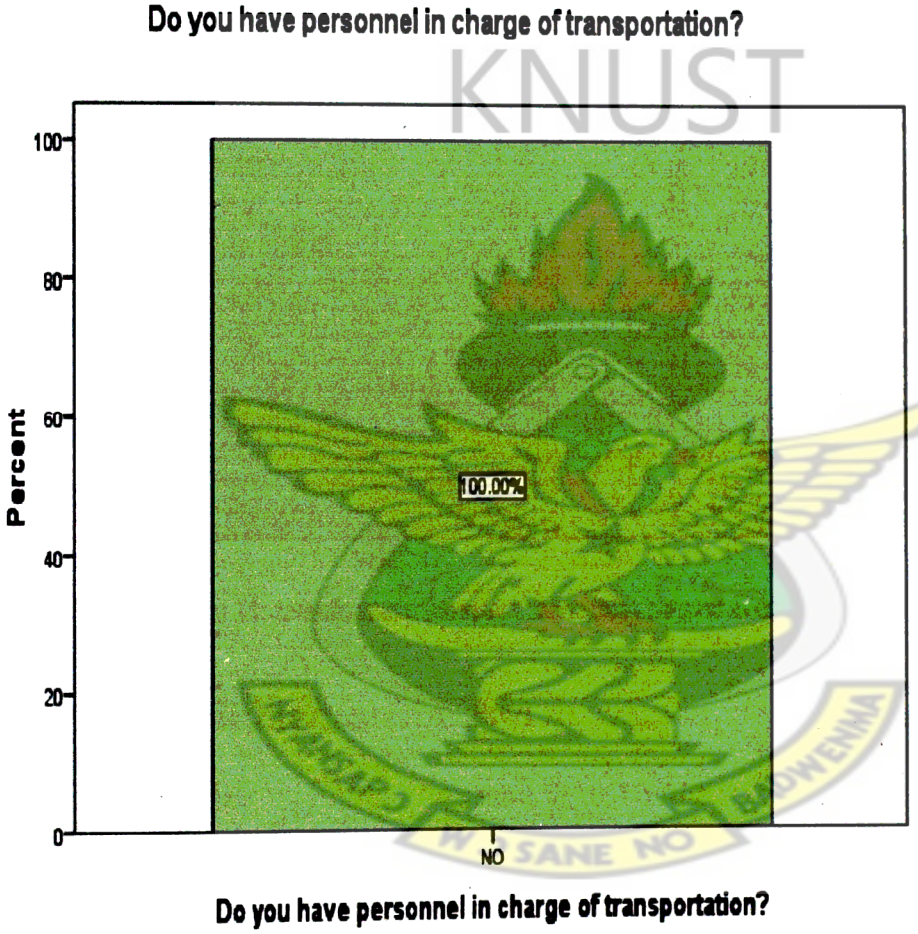


Source: (Authors field survey July, 2009)

Figure 4.2 Number of transporters in each district

Thirty-two(32) out of forty(40) representing 80% of the respondent on the question to know whether each district deals with one transporter or more shows that olam DOs do not rely on one transporter due to the unreliable nature of the transport business.

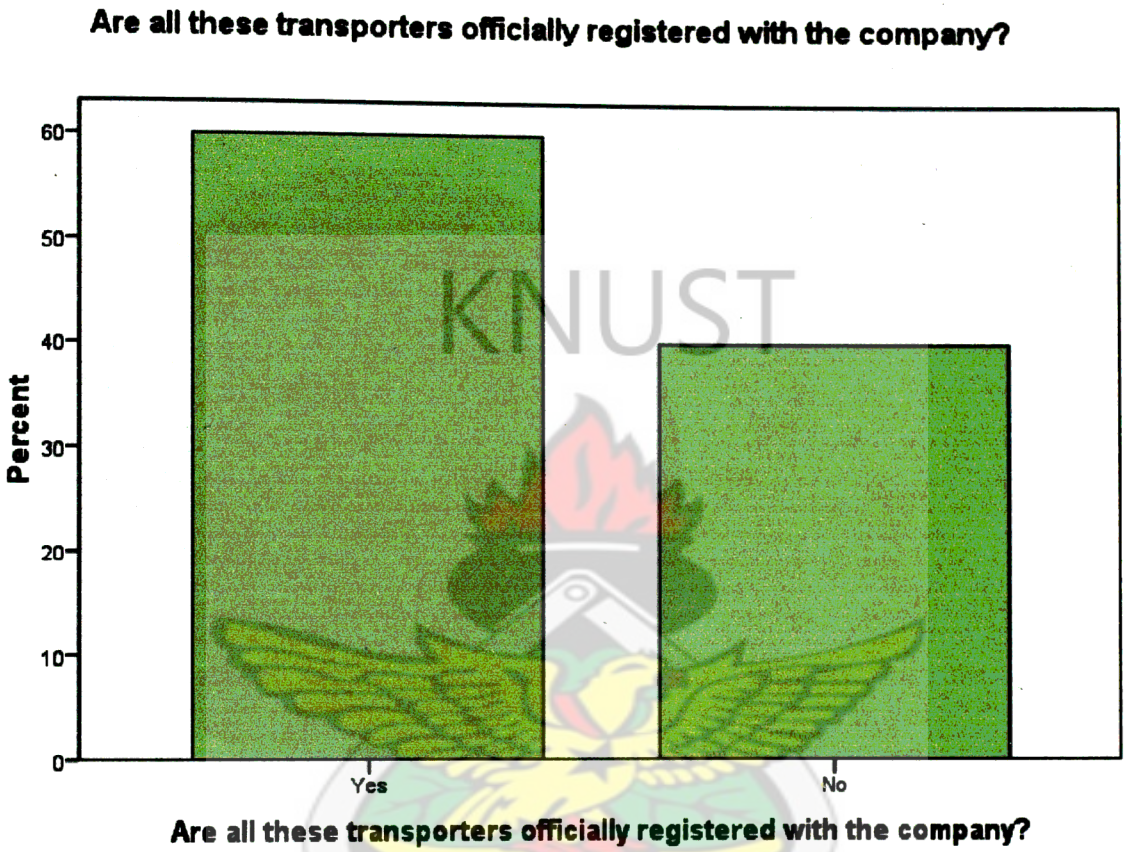
Figure 4.3: Do you have personnel in charge of transport?



Source: (Authors field survey July, 2009)

Figure 4.3 Personnel in charge of transportation

All the forty respondent, both DOs and ZMs do not have personnel in charge of one of the most important functions of their operations. This means that transport arrangements are the responsibilities of the district officers and zonal managers.

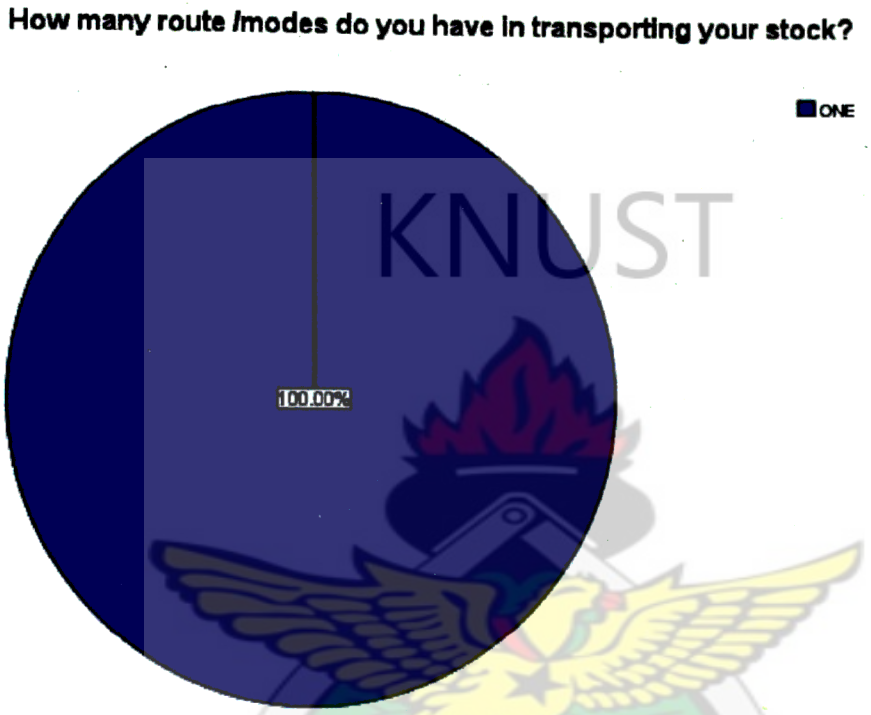


Source: (Authors field survey July, 2009)

Figure 4.4 Registered transporters with the company

Almost half of their transporters are not officially registered with the company. This exposes the stock into high level of risk since when the driver divert the stock would be difficult to trace them. Also, in case delay which causes a lot of damages to the stock happens would be difficult to offload the cost to the transporter/driver since there are know written document binding the contract.

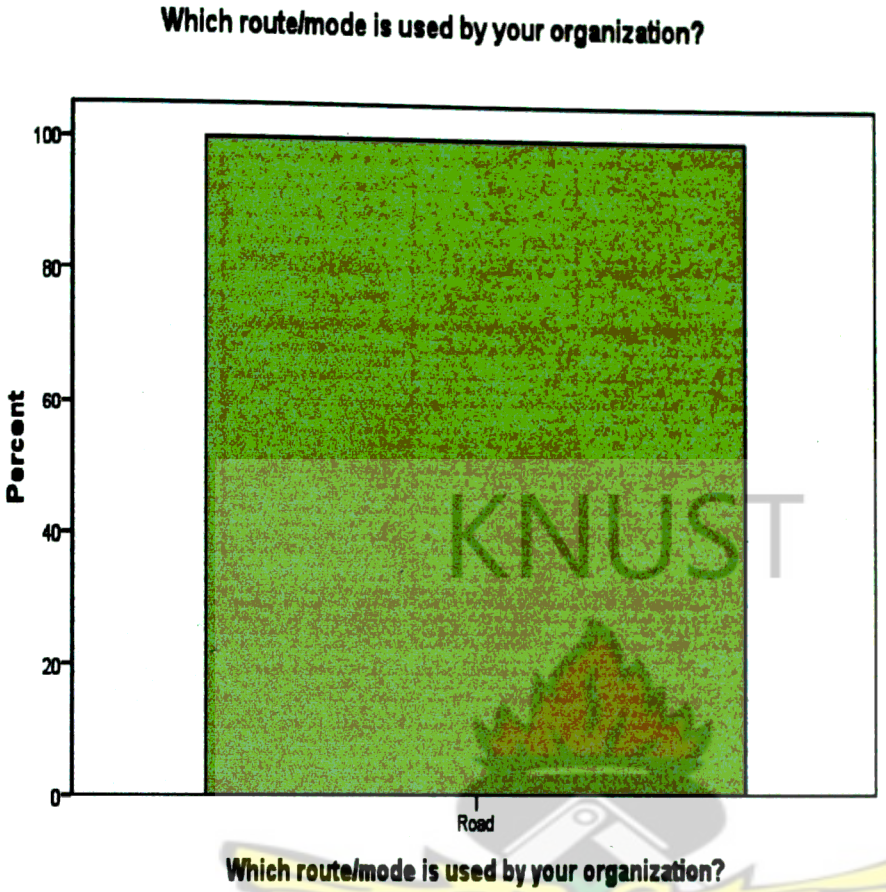
Table 4.1 How many transport mode/s do you use for your secondary evacuation



Source: (Authors field survey, July 2009)

Figure 4.5 Mode of transportation for secondary evacuation

Cocoa buying companies in Ghana currently has only one mode of evacuating stock to the take over point (port). Even though, some of the dispatching depots are along the railway lines that could carry the goods in bulk but due to the deteriorating nature of the railways in the country, LBCs have no option than to ship their stock through the road transportation only. This is shown in both the pie chart and the table above.



Source: (Author's field survey July, 2009)

Figure 4.6: Mode used by the organization

Road transportation seems to be the only means of transporting Ghana cocoa from the various cocoa growing areas to the ports for onwards shipment as the statistics has shown 100% respondents.

Table 4.2 Which transport mode do you consider to be the best for your organization?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Road	28	70.0	70.0	70.0
	Rail	12	30.0	30.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Though road transport tops with 70% of the question to the Dos and ZMs on the type of transport mode they consider to be the best for their district and zones, others, that is 30% also think rail transport could be the best for their districts because it carries more loads than the trucks, which could ease them the problem of overstocking in their various warehouses.

After the above question on the mode of transport best for them where the majority of them chose road, a question followed as;

How relevant are your reasons for your mode of transport(Indicate your level of relevance with 1-4 , is irrelevant - 4 most relevant) and the following reasons were posed to the respondents to attach their level of relevance to them:

Flexility

Coverage

Speed

High level of customer service

Energy efficient

Single handling

High volumes and tonnageRespondents gave the following rankings in the tables below:

Table 4.3 Flexibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Relevant	1	2.5	2.5	2.5
	More Relevant	15	37.5	37.5	40.0
	Most Relevant	24	60.0	60.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.4 Coverage

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Relevant	2	5.0	5.0	5.0
	More Relevant	12	30.0	30.0	35.0
	Most Relevant	26	65.0	65.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.5 Speed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Relevant	2	5.0	5.0	5.0
	Relevant	15	37.5	37.5	42.5
	More Relevant	15	37.5	37.5	80.0
	Most Relevant	8	20.0	20.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.6 High level of customer service

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Relevant	9	22.5	22.5	22.5
	More Relevant	15	37.5	37.5	60.0
	Most Relevant	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.7 Energy Efficient

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Relevant	1	2.5	2.5	2.5
	Relevant	16	40.0	40.0	42.5
	More Relevant	7	17.5	17.5	60.0
	Most Relevant	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.8 Single- handling

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Relevant	4	10.0	10.0	10.0
	Relevant	9	22.5	22.5	32.5
	More Relevant	2	5.0	5.0	37.5
	Most Relevant	25	62.5	62.5	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

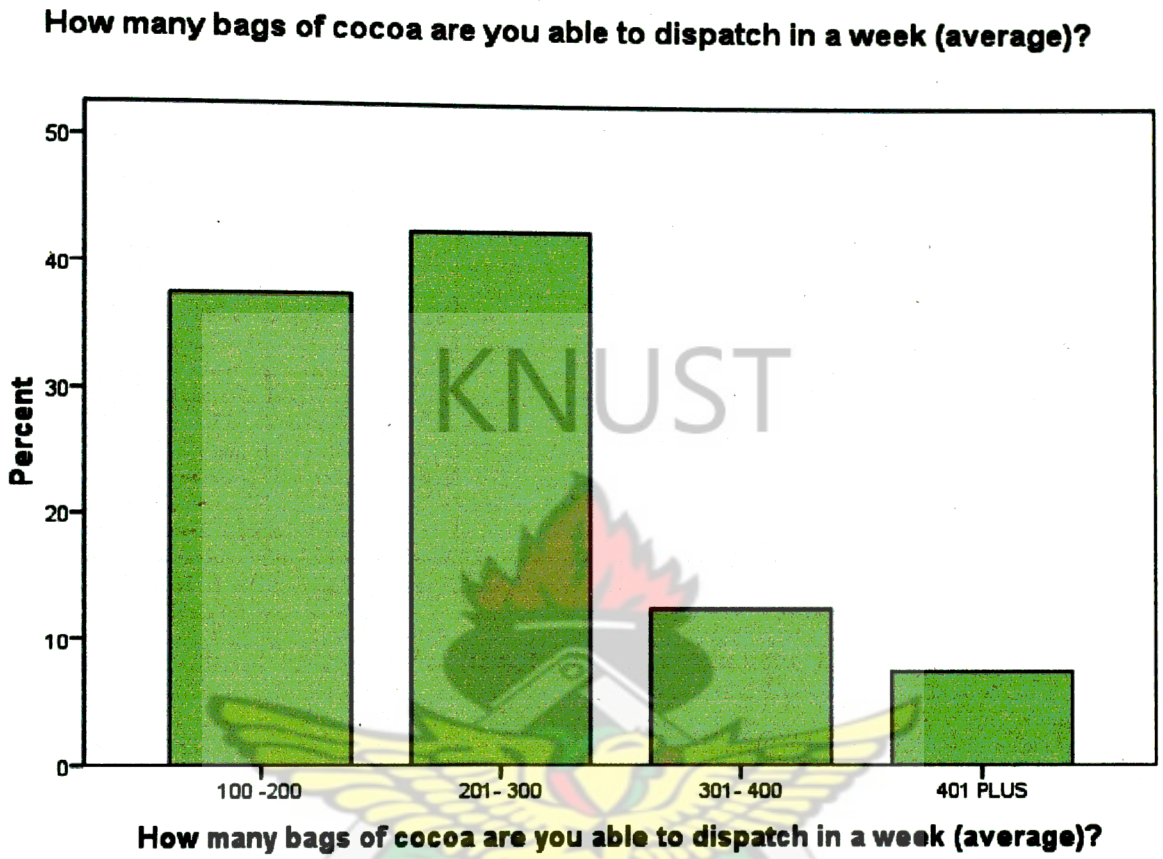
Table 4.9 High volumes and Tonnage

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Relevant	2	5.0	5.0	5.0
	Relevant	10	25.0	25.0	30.0
	More Relevant	8	20.0	20.0	50.0
	Most Relevant	20	50.0	50.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Cocoa buying companies in Ghana prefer the road transportation to other forms or modes of transportation for the above reasons but with varying degrees of importance. Road has been ranked by many as most relevant for it flexibility, coverage ,single handling , with 60%, 65%, and 62.5% respectively. Road transportation is said to be the most flexible among all by the LBCs because the trucks are able to stop anywhere to pick their wares. Coverage is also true since it could reach every hinterland where other transport modes are not able to reach. Road transportation for their secondary evacuation has a single handed characteristic; due to the fact that once trucks are dispatched get straight to the take over point (port), unlike the rail where another truck has to be arranged for further shipment to the port for quality control checks and cocobod specifications. 50% of the respondents who rated "high volumes and tonnage" and 40% for "Energy Efficient" as most relevant, are those who consider rail transport as best for their districts. It could also be stated these respondent are those along the railways and consider rail as having energy efficient and could also carry

high volumes of loads for effective cost savings and reduction in the risk of over stocking in their various depots as a result of drivers not being reliable.



Source: (Author's field survey July, 2009)

Figure 4.7: Average dispatch of cocoa in a week by the district

About 73% of the Dos said their capacity for the week is less than 400 bags of cocoa so if their truck has a higher capacity of more than 400 then the truck has to pick stocks from the nearby district that would make a full load for shipment to the port. This is one of the reasons why LBCs prefer road transportation to the other modes . road transportation is said to be more flexible and can reach even hinterlands than any other mode.

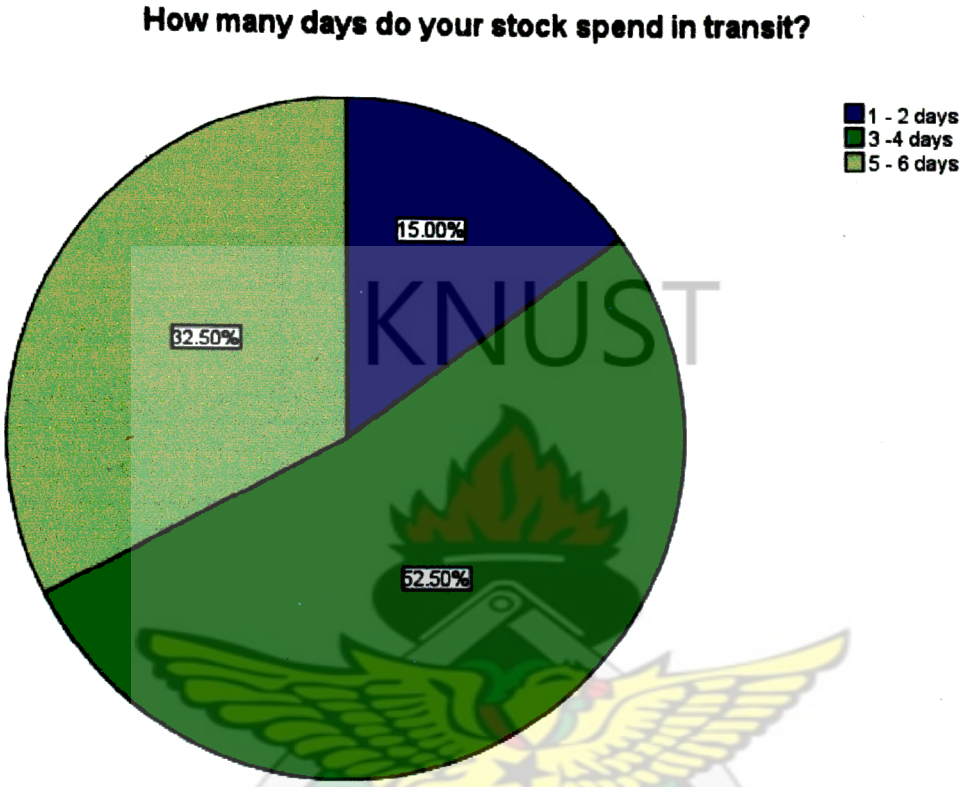
Table 4.10 What is the capacity of the truck (in bags of cocoa) assigned to your district?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	200 – 300	1	2.5	2.5	2.5
	301 – 400	2	5.0	5.0	7.5
	401 – 500	12	30.0	30.0	37.5
	501 plus	25	62.5	62.5	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Trucks assigned to the various districts for the cocoa evacuation to the ports have capacities of more than 500 bags. This means that Olam transporters have trucks that carries more stocks to the ports.

Figure 4.8: How many days do your stock spend in transit ?



Source: (Author's field survey July, 2009)

Transit time here is the time duration from offload point to the take over point . From the figure 21 respondents representing 52% said it takes them 3-4 days in transit, it could be said that 85% of them have their stock in transit for more than 4 days. The reasons are partly due to the inefficient drivers and also port officials who through their operations causes the trucks to delay at the port.

Table 4.14 Reputation of the transport company

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	16	40.0	40.0	40.0
	More Important	8	20.0	20.0	60.0
	Most Important	16	40.0	40.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.15 Capacity of the truck

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Important	1	2.5	2.5	2.5
	Important	9	22.5	22.5	25.0
	More Important	7	17.5	17.5	42.5
	Most Important	23	57.5	57.5	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.12 Speed/ transit time of the truck

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	2	5.0	5.0	5.0
	More Important	9	22.5	22.5	27.5
	Most Important	29	72.5	72.5	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4.13 Reliability of the transporter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	2	5.0	5.0	5.0
	More Important	6	15.0	15.0	20.0
	Most Important	32	80.0	80.0	100.0
	Total	40	100.0	100.0	

Source: field survey July, 2009

Table 4.11 Do you encounter any risk with the use of 3rd party transportation in your company?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	34	85.0	85.0	85.0
	No	6	15.0	15.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

When the researcher wanted to know from the company whether outsourcing of their transportation function for their secondary evacuation has inherent risk , 85% yielded with numerous degrees of risk some of which are the following:

- Delaying causes substandard goods thereby faces rejection at the port
- Recalcitrant drivers for lack of control by the LBC causes road accident

A question on the factors to be considered when selecting a transporter or truck for evacuation was put . Respondents were asked to choose from less important to most important. The factors are listed below in tables 4.19- 4. 24 .

This question has been analysed by the use of the Analytical Heirarchy Process (AHP) model.

Table 4.16 Price/cost per bag of cocoa

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Important	17	42.5	42.5	42.5
	Important	6	15.0	15.0	57.5
	More Important	12	30.0	30.0	87.5
	Most Important	5	12.5	12.5	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

Table 4. 17 Security of the stock

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Important	2	5.0	5.0	5.0
	Important	5	12.5	12.5	17.5
	More Important	5	12.5	12.5	30.0
	Most Important	28	70.0	70.0	100.0
	Total	40	100.0	100.0	

Source: (Author's field survey July, 2009)

The above question on the factors to consider when the LBCs are selecting transporters for their evacuation was put so as to use a model (AHP) as stated in the literature above. To achieve the aim of using the AHP as a model of selection, I have chosen to pick the first four factors that had the highest percentage for the option

"most important". Looking at the 5 tables above (transit time, reliability, reputation, capacity, price and security), the following are their percentages;

Speed/transit time 72.5%, Reliability 80%, Reputation 40%, Capacity 52.5%, Price 12% and Security 70%. Even though all the above are important factors to be considered when selecting a transporter, for the purpose of this project and the model, the first four shall be picked for this model.

Adopting the preference level in the AHP literature above by Russel and Tailor(2003), with three suppliers (A B C) for the four criterion are summarise in the matrix below using Reliability, Speed, Security and Capacity as criterion for this analysis. Let also represent the three transport companies to be considered with: IKE, NAA, and SUU (I N S). The researcher pairwise comparison ratings for the three suppliers of transport services to Olam for their secondary freight for each of the four criterion are summarised in the following matrices. This pairwise rating has been calculated with the use of excel spread sheet which has been displayed in appendix one

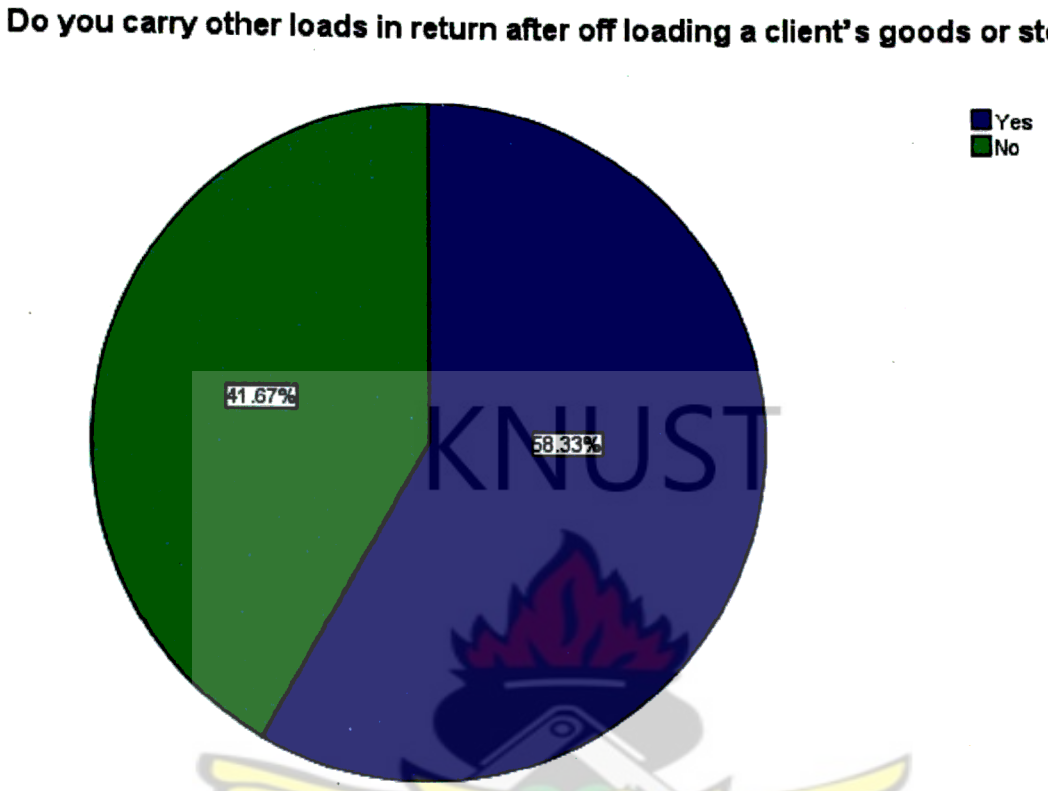
	RELIABILITY				SPEED				SECURITY				CAPACITY			
	I	N	S		I	N	S		I	N	S		I	N	S	
I	1	3	2		I	1	6	1/3	I	1	1/3	1	I	1	1/3	1/2
N	1/3	1	1/5		N	1/6	1	1/9	N	3	1	7	N	3	1	4
S	½	5	1		S	3	9	1	S	1	1/7	1	S	2	¼	1

After going through with the excel spread sheet (as attached in appendix one), the following result were arrived at for the three haulage companies, IKE , NAA, SUU.

TRANSPORTER	SCORE	POSITION
IKE	0.2904	3RD
NAA	0.3817	1ST
SUU	0.3279	2ND
	1.000	

Based on these scores, Transporter "NAA" should be selected. In order to rely on this result the company must have confidence in the judgments made in developing the pair wise comparisons. However, even if the company does not make its selection based on the AHP result, following this process can help identify and prioritise the criteria and identify the strengths and weaknesses of the different transporters.

Also, if the company decide on the number of transporters to be selected then invitation to bid has to be extended to many so that based on the score the number needed could be picked.



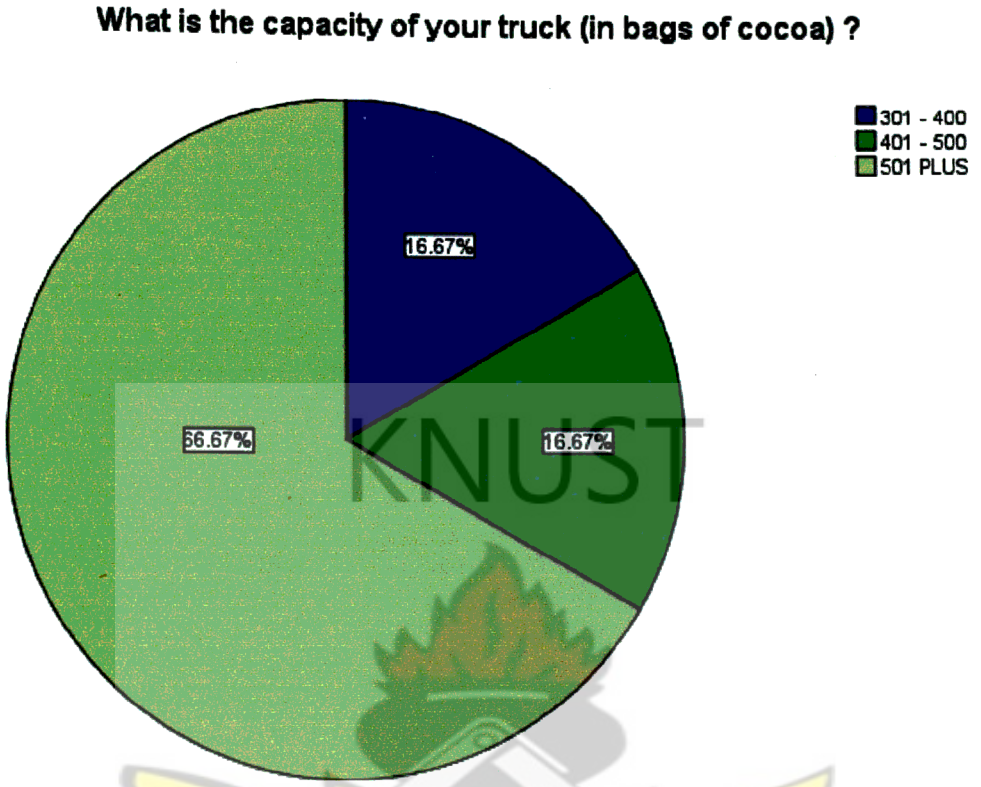
Source: (Author's field survey July, 2009)

Figure 4.14 Drivers who carry goods in return before returning for the next dispatch

Drivers of the trucks who carries the company's cocoa to the port , instead of returning straight for the next consignment wait and carry other goods in return thereby causes delay with its negative consequences to the organization. The table shows that more than half of the respondents, that is 58.3% are in this habit which distort the activities of the LBCs.

Table 4. 18 How long does it take to have your service charge paid?

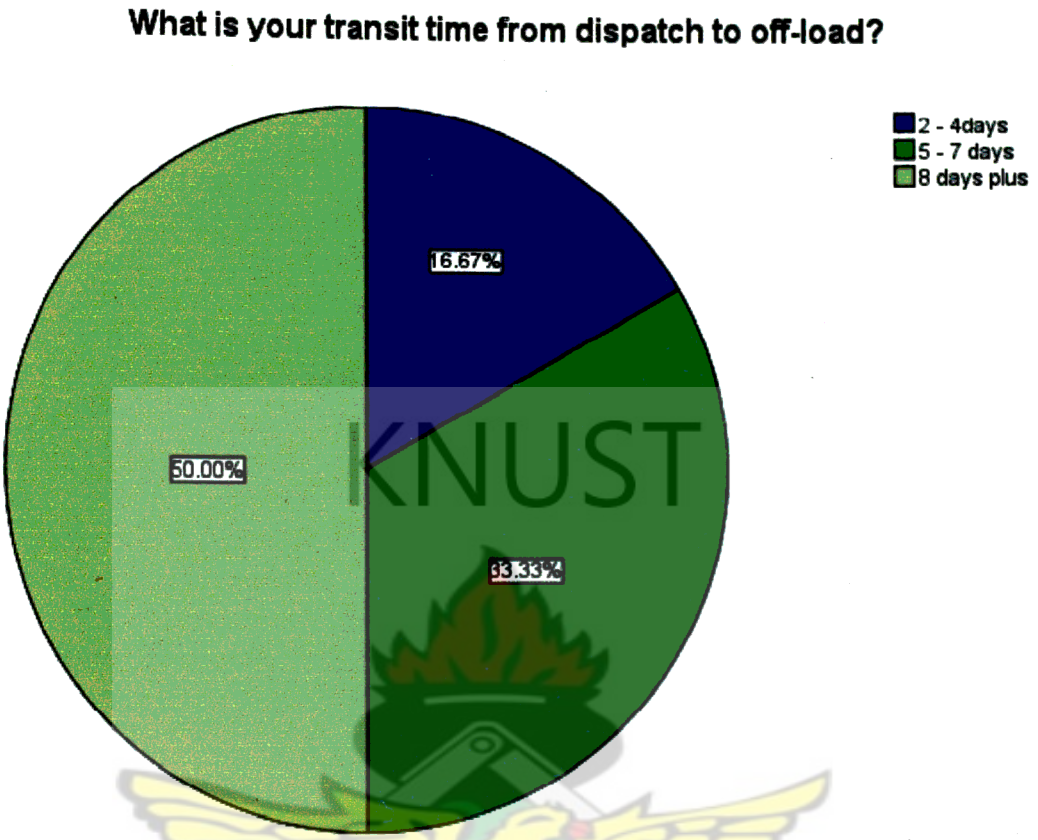
	Frequency	Percent	Valid Percent	Cumulative Percent



Source: (Author's field survey July, 2009)

Figure 4.13: Capacity of transporters truck

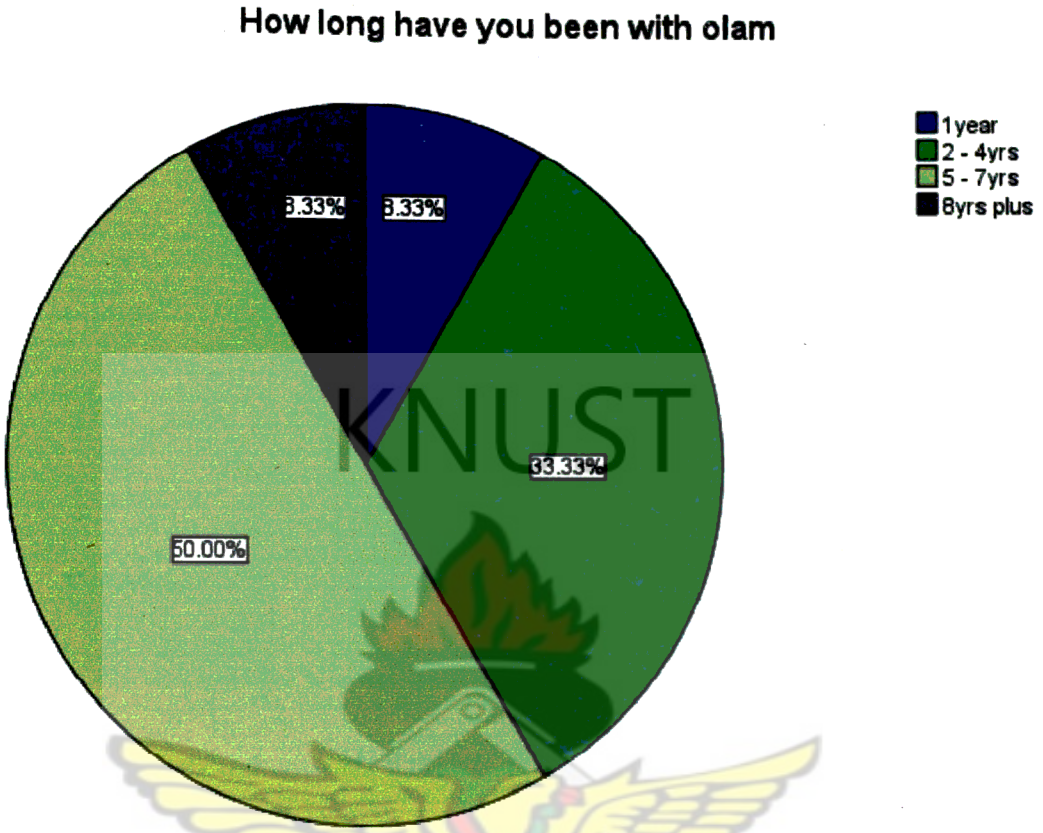
About 67% of the trucks used by the company for their secondary freight have capacity of more than 500. This means that the company could carry more stocks in a week. It also imply that they have to pick stocks from different districts sometimes before getting full load to the port since most of the Dos do not dispatch such an amount of cocoa in a week.



Source: (Authors field survey July, 2009)

Figure 4.12: Transit time of transporters

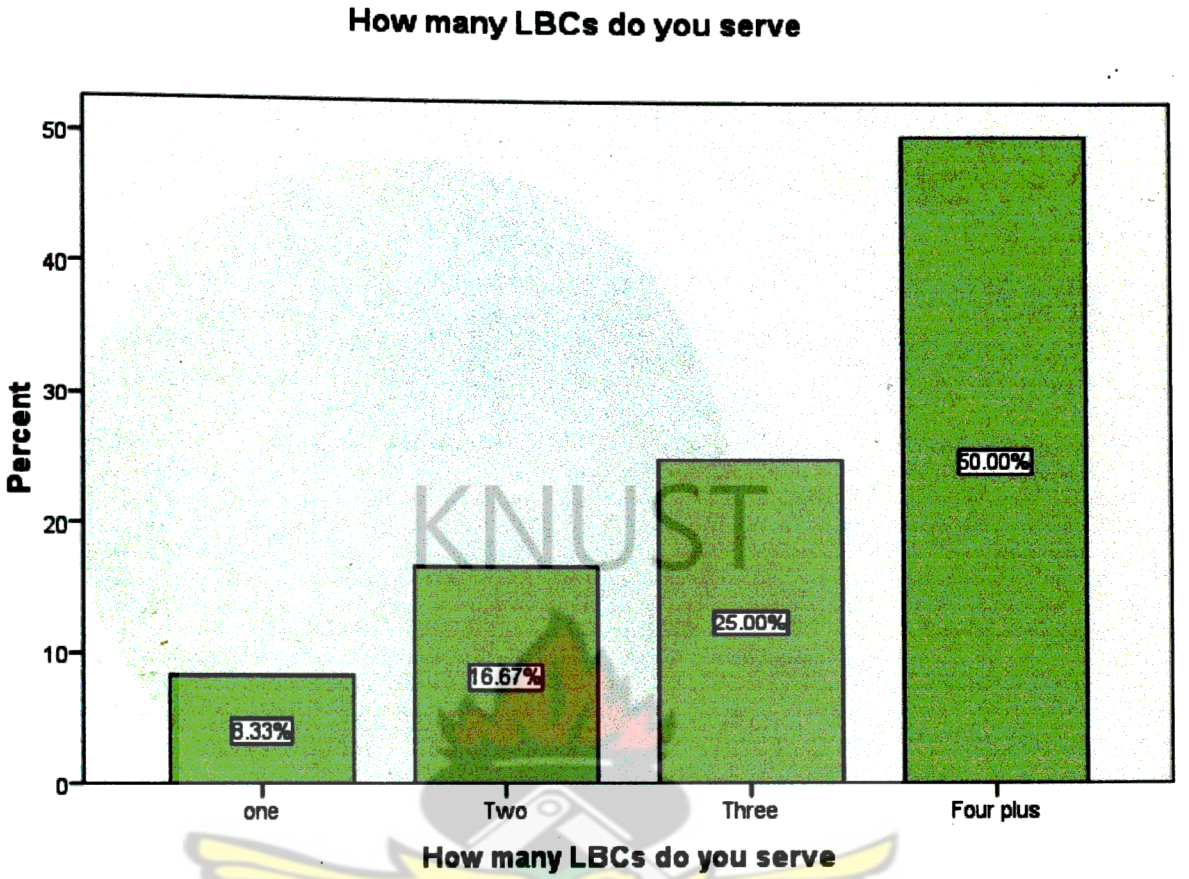
Out of the 12 transporters who responded to he above question, about 83% said they spend not less than 5days on transit , that is from loading at the depot to offloading at the port. It also confirms the Dos claims above.



Source: Author's field survey July, 2009

Figure 4. 11: Number of years transporters have served the company

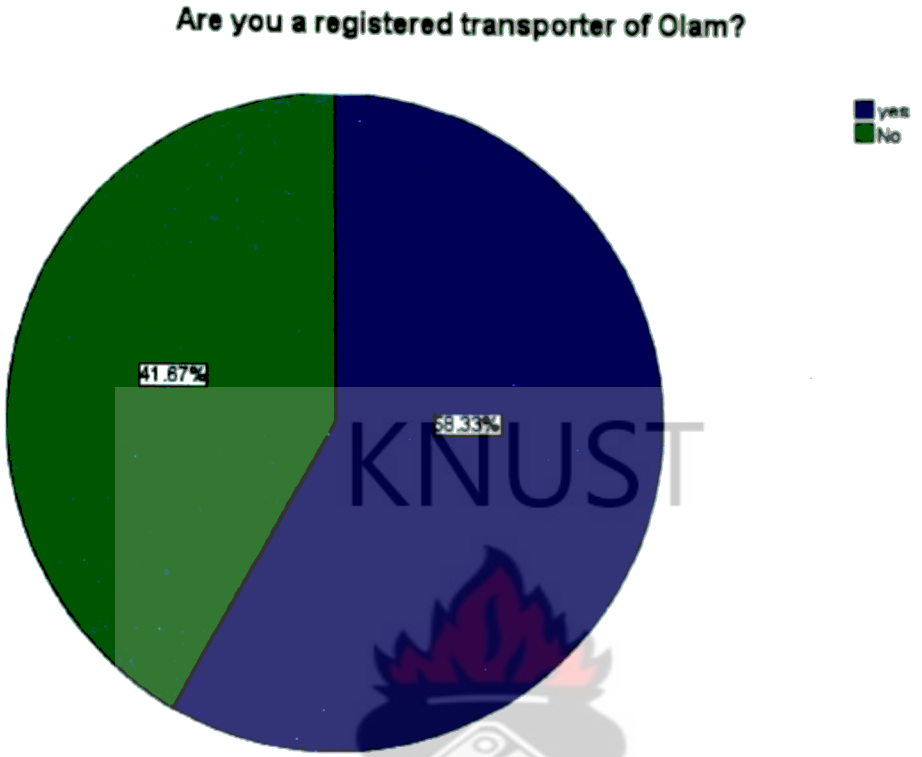
There are about 90% of the respondents who have been with the company for more than one year. This means that management do not review the activities of these transporters to see whether they are still in shape to continue with the contract, re-examination of the conditions of their respective trucks for the evacuation to long distances need to be carried on .This also shows clientele loyalty and could also assure the company of regular supply of services without thinking of diverting their focus into transport functions



Source: Author's field survey July, 2009)

Figure 4. 10: Number of LBCs transporters serve

Transporters unreliability attitudes clearly show in the table above when about 90% claim to serve more than one LBC. This could be the reason that some LBCs might give prompt payment for their service charge unlike Olam Company. The 8.3% of respondents who answered "one" are the loyal transporters of Olam as a company.



Source: (Author's field survey July, 2009)

Figure 4.9 Are you a registered transporter of Olam

Though Olam has a policy of loading only registered trucks but due to the unreliable attitudes of some drivers, sometimes have to fall on unregistered transporters for fast evacuation. The 58.3% of the respondents who answered yes indicate that most of their transporters are registered.

Table 4. 18 How long does it take to have your service charge paid?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	10 days plus	12	100.0	100.0	100.0

Source: (Author's field survey July, 2009)

All the transporters who answered the above question said the company do not make prompt payment after discharging their duties with them. This might also necessitate for the transporters registration with more than one LBC . it might also be the reason why most of the drivers have to carry goods in return.

Guided interview questions for the Branch Manager (BM).

1. Why do outsource transportation function considered an important function?
2. What are the processes you go through before you outsource?
3. What model do you use in the selection of your transporters?
4. How do deal with losses, short landing of stocks at the port?
5. How often do you review your transporters?
6. Do you involve experts in the selection of your transporters?
7. Do you conduct cost-benefit analysis before outsourcing?

Following response was given by the BM:

Our main function in this business is to procure cocoa or to do the internal marketing of quality cocoa beans for Ghana cocobod.our business profitability depends largely

on the volume, cost savings, speed and margin of profit. This could only be achieved if we remain focused on the procurement function. Though transportation cost is paid by the cocobod, as a businessman with profit maximization as your primary objective, you have to do everything possible to save cost across all the functions.

We don't have a specific model the company uses to select who should ship our stocks. Once the truck is strong with higher capacity to carry more loads and also is road worthy, why not! It mandated by all and sundry to load vehicles who are officially registered with Olam but you know sometimes our Dos and even zonal heads would go ahead to load unregistered trucks. There was an occasion where an unregistered truck redirected about seven hundred bags of cocoa enroute to the port. We had a difficult time retrieving such stolen stocks.

When there is short landing at the port it is the responsibility of the transporters but what if he defaults payment or delays payment. This goes a long to affect our profit margin etc. the Dos and the ZH are capable of running transport affairs so there is no need to have transport unit at the district offices. The manager at the grassroots recommends the transporters and when I'm satisfied with their records, they are subsequently signed on as transporters for our secondary evacuation. We don't involve experts in this issue. So generally we see outsourcing of our transport function as beneficial. We don't pay for maintenance, drivers, fuel etc. it is good for us. when compare the cost on even the kia trucks for our primary evacuation to what we pay for the secondary evacuation, we can confidently state that outsourcing is highly beneficial

CHAPTER FIVE

Summary of the findings, recommendations and conclusion

5.1 Summary of the findings

The following were the findings the researcher identified when an assessment on the outsourcing of the transportation functions of the cocoa buying companies in Ghana with Olam an LBC was chosen as a case study.

It was found out that Cocoa buying companies in Ghana mode of transportation for their secondary freight to the port was road transportation. Though some are with the opinion that rail transportation would be more convenient considering the area they operate.

Most of the LBCs have outsourced their transportation function to logistics companies who have the competence and the technical know-how. Olam for instance have given out the entire secondary freight to transport providers.

The outsourcing companies (LBCs) do not have any models for the selection of their transporters. This does not help the companies get the best that would limit the level of risk associated with the outsourcing exercise.

Transporters /drivers are not reliable to their clients because they don't receive prompt payments for their services. LBCs defer payment for quite too long so transporters find so many ways of maintaining their business.

The LBCs do not have much control on the third party logistics company. This is because the transporters run different administration.

The cocoa buying companies are able to save cost by offloading the transportation function to the transport providers. Though cocobod foot the transport cost, LBCs try

to make savings out of it. Delaying of the drivers to go for the next consignment causes the LBCs who have wholly outsourced their transportation functions a great risk such as overstocking and sub-standard of the cocoa beans and subsequent rejection at the port. Cocobod officials at the port sometimes contribute to the delay and the conjection at the take – over-point. The transporters are recommended by the Zonal managers and the district officers, even though decision making on the outsourcing of transportation is taken by the branch managers. Most of the LBCs do not have transportation personnel at the upcountry operational levels to monitor the activities of the transporters/drivers.

5.2 Conclusion

This study provided some survey results of one company among the LBCs of a selected cocoa growing area in Ghana. Precisely western region which is considered as one of the major producers of cocoa beans in Ghana was selected as the study area. There were forty-seven respondents, seven of whom are transporters / drivers and the rest being District Officers and Zonal managers who deal directly with the transporters. Outsourcing decisions are taken by the Branch managers and as such one of them was granted an interview where questions regarding selection, reasons for outsourcing and the models used were asked.

It was detected that most of the transporters/drivers are not reliable because they have registered with more than one LBC. They also delay due to the fact that they wait and carry other stocks from the destination point before coming for their next load

Transportation outsourcing is also risky and this is due to improper maintenance, lack of review of contract terms, inexperience drivers causing road carnage etc. Outsourcing has gone a long way and has gained enough grounds in Ghana especially in the cocoa industry's transportation function for their freights to the ports.

Road transportation is not the only mode of transportation suitable for the cocoa industry since rail has also been recommended by some personnel in the field for its high volume of tonnage. Information gathered indicates that it would be beneficial for all if the government of Ghana could revamp rail transport system in the country.

Information has revealed that Ghana cocoa Board has three destination points (Takoradi, Tema and Kaase in Kumasi) where they receive cocoa beans for onwards dispatch to their various markets globally. They are the sole exporters of Ghana cocoa beans whiles the LBCs do the internal marketing with the farmers.

Cocoa buying companies stands the chance of reducing their outsourcing risk if they are able to use certain models for the selection of their transporters and transportation model for dispatch leading to cost reduction. This would help them to achieve maximum benefits in the outsourcing of their transportation function.

5.3 Recommendations

Given the information gathered in this project, we propose the following set of recommendations for cocoa buying companies (LBCs) who have outsourced their transportation functions, cocobod and the government of Ghana:

Pay particular attention to the institutional setting in which the outsourcing is taking place. Will this decision negatively impact the cocoa buying company by assigning an the transportation function which is very sensitive in the cocoa industry? Incorporate these issues into the decision making process. The decision to outsource incorporates a series of risks. These need to be carefully assessed. Measuring provider performance can potentially be a point of contention for the outsourcing relationship. Objective measures need to be mutually established with opportunities for modification as the need arises.

I recommend the Analytical Hierarchy Process (AHP) as a model for selecting transporters by the LBCs . When this model is used the company stands at a better chance of getting cream of transporters who are better qualified and could also help reduce outsourcing risk. After a company has selected these transporters by the AHP model the following must be checked before allowing the trucks to load; no cocoa should be loaded on a non-registered vehicle. All transporters used for cocoa operation need to be registered at the LBC office. All transporters must submit the following information: truck number, chassis number , proof of ownership/letter of authority driver name, driver license no. All registered transporters must be issued an "Olam Approved" sticker (with annual expiry). This must be displayed on the truck. There shall be an annual review of transporters to ensure strict adherence to the terms and conditions of the company. List of registered trucks will be circulated to all upcountry depots. This list is to be consulted while loading any truck. Each truck must have a signed Olam sticker which all registered trucks will carry.

The government of Ghana must also revive the railway transportation system to become vibrant as the road transportation. This could facilitate the movements of cocoa to the ports, especially those along the railways. It would also evacuate more volumes of stock and reduce operational cost because of its energy efficiency.

Cocobod in conjunction with the LBCs are to determine the requirements from the various district depots and the destination requirement at the various take over point (ports) .When the source capacity and destination requirements are known a transportation model especially Vogel approximation model (VAM) can be use to save cost for the LBCs, cocobod in particular and the government of Ghana as a whole. This will reduce the transit time of evacuation and facilitate the movement of cocoa beans from the various depots to the ports.

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QUESTIONAIRE

KNUST SCHOOL OF BUSINESS

DEAPRTMENT OF INFORMATION AND DECISION SCIENCE

This questionnaire is for academic purposes and any information given will be treated confidential

Instruction: Kindly tick or write in the spaces provided where necessary and appropriate

The Staff of Olam up country operation (zonal managers and district officers)

Section A: Personal Data

1. Gender {1} ____ Male {2} ____ Female

2. Age {1} ___ 20-29 {2} ___30 - 39 {3} ___40 – 49 {4} ____ 50 and above

3. Educational background {1} __Cert/Dip {2} __HND {3} __Degree {4} __Others

4. Years spent in the Organization {1} __1- 5 {2} __6 – 10 {3} _11-15 {4} __>15

5. Position in the organization .....

Section B: Organizational data

6. Do you have official transport for your secondary evacuation? {1} __Yes {2} _ No

7. If no, how do you transport your stock to the Port? .....

.....

8. How many transporters do you have in your district/zone?

{1} ___ 1 {2} ___ 2 – 4 {3} ___ 5- 7 {4} ___ 10 and above

9. Are all these transporters officially registered with the company? {1} _Yes {2}_ No

10. Do you have personnel in charge of transportation? {1} ___ Yes {2} ___ No

11. What is the major source of your transportation?

{1} ___ In – house {2} ___ Outsourcing or third party logistics {3} ___ Others

12. If others, specify .....

13. How many route /modes do you have in transporting your stock?

{1} ___ One {2} ___ Two {3} ___ Three {4} ___ Four

14. Which route/mode is used by your organization? {1} ___ Road {2} ___ Rail {3} ___ Inland water {4} ___ others.

15. If others, specify .....

16. Which transport mode do you consider to be the best for your organization?

.....

17. How relevant are your reasons for your mode of transport?

(Indicate your level of relevance with 1-4 , is irrelevant - 4 most relevant)

	{1}	{2}	{3}	{4}
-Flexibility	[ ]	[ ]	[ ]	[ ]
-Coverage	[ ]	[ ]	[ ]	[ ]

-Speed [ ] [ ] [ ] [ ]

-High level of customer service [ ] [ ] [ ] [ ]

-Energy efficient [ ] [ ] [ ] [ ]

-Single-handling [ ] [ ] [ ] [ ]

-High volumes and tonnage [ ] [ ] [ ] [ ]

18. How many bags of cocoa are you able to dispatch in a week (average)?

{1} ___100- 200{2} ___201- 300 {3} ___301-400 {4}401 and above

19. What is the capacity of the truck assigned to your district?

{1} ___200-300 {2} ___301-400 {3} ___401-500 {4}___501 and above.

20. How many days do your stock spend in transit?

{1} __1- 2 days {2} _ 3 – 4 days {3} __5- 6 days {4} _ 7 days and above.

21. Do you encounter any risk with the use of 3rd party transportation in your company? {1} __Yes {2} __ No

22. If yes, mention some of them .....

.....

.....

23. How important are the following when selecting a truck/ transporter for your evacuation? (Choose between 1 and 4 , 1 is less important- 4 very important)

	{1}	{2}	{3}	{4}
-Speed/transit time of the truck	[ ]	[ ]	[ ]	[ ]
-Reliability of the transporter	[ ]	[ ]	[ ]	[ ]
-Reputation of the transport company	[ ]	[ ]	[ ]	[ ]
-Capacity of the truck	[ ]	[ ]	[ ]	[ ]
-Price/cost per bag of cocoa	[ ]	[ ]	[ ]	[ ]
-Security of the stock	[ ]	[ ]	[ ]	[ ]

Thank you for taking the time to complete this questionnaire .Your input is greatly appreciated.

KNUST- SCHOOL OF BUSINESS

DEAPRTMENT OF INFORMATION AND DECISION SCIENCE

This questionnaire is for academic purposes and any information given will be treated confidential

Instruction: Kindly tick or write in the spaces provided where necessary and appropriate

The Transporters /Drivers

Section A: Personal Data

1. Gender {1} ____ Male {2} ____ Female

2. Age {1} __20-29 {2} ___30 - 39 {3} ____ 40 – 49 {4} ____ 50 and above

3. Educational background {1} __Cert/Dip {2} __HND {3} __Degree {4} _Others

4. Years spent in the Organization {1} __1- 5 {2} __6 – 10 {3} _11-15 {4} ___>15

5. Position in the organization .....

Section B: Organizational data

6. Are you a registered transporter of Olam – cocoa division ? {1} __Yes {2} __ No

7. How many clients (LBCs) do you serve ?

{1} ___ 1 {2} ___ 2 – 4 {3} ___ 5- 7 {4} ___ 8 and above

8. How long have you been with olam

{1} ___ 1 yrs {2} ___ 2 – 4yrs {3} ___ 5- 7yrs {4} ___ 8yrs and above

9. What is your transit time from dispatch to off-load?

{1} ___ 1 days {2} ___ 2 – 4days {3} ___ 5- 7days {4} ___ 8days and above

10. What is the capacity of your truck (in bags of cocoa) ?

{1} ___200-300 {2} ___301-400 {3} ___401-500 {4}___501 and above.

11. Do you carry other loads in return after off loading a client's goods or stock?

{1} __Yes {2} __ No

12 How long does it take to have your service charge paid?

{1} ___ 1day {2} ___ 2 – 4 days {3} __ 5- 6 days {4} ___ 7 days and above.

Thank you for taking the time to complete this questionnaire .Your input is greatly appreciated.

AHP MODEL

RELIABILITY

TRANSPORTER	I	N	S
I	1	0.5	3
N	2	1	4
S	0.33	0.25	1
TOTAL	**3.33**	**1.75**	**8**

RELIABLITY

TRANSPORTER	I	N	S	**ROW AVERAGE**
I	0.3003003	0.285714286	0.375	**0.320338195**
N	0.600600601	0.571428571	0.5	**0.557343057**
S	0.099099099	0.142857143	0.125	**0.122318747**
				1

SPEED

TRANSPORTER	I	N	S
I	1	1	3
N	1	1	5
S	0.33	0.2	1
	2.33	**2.2**	**9**

SPEED

TRANSPORTER	I	N	S	ROW AVERAGE
I	0.429184549	0.454545455	0.333333333	**0.405687779**
N	0.429184549	0.454545455	0.555555556	**0.479761853**
S	0.141630901	0.090909091	0.111111111	**0.114550368**
				1

SECURITY

TRANSPORTER	I	N	S
I	1	0.5	0.25
N	2	1	0.5
S	4	2	1
	7	**3.5**	**1.75**

SECURITY

TRANSPORTER	I	N	S	ROW AVERAGE
I	0.142857143	0.142857143	0.142857143	**0.142857143**
N	0.285714286	0.285714286	0.285714286	**0.285714286**
S	0.571428571	0.571428571	0.571428571	**0.571428571**
				1

CAPACITY

TRANSPORTER I	N	S
I	1	3	6
N	0.33	1	3
S	0.17	0.33	1
	1.5	**4.33**	**10**

CAPACITY

TRANSPORTER	I	N	S	ROW AVERAGE
I	0.666666667	0.692840647	0.6	**0.653169104**
N	0.22	0.230946882	0.3	**0.250315627**
S	0.113333333	0.076212471	0.1	**0.096515268**
				1

CRITERIA	RELIABILITY	SPEED	SECURITY	CAPACITY
RELIABILITY	1	4	0.5	3
SPEED	0.25	1	0.2	0.5
SECURITY	2	5	1	3
CAPACITY	0.33	2	0.33	1
	3.58	**12**	**2.03**	**7.5**

CRITERIA	RELIABILITY	SPEED	SECURITY	CAPACITY	AVERAGE
REIABILITY	0.279329609	0.333333333	0.246305419	0.4	**0.314742**
SPEED	0.069832402	0.083333333	0.098522167	0.066666667	**0.079589**
SECURITY	0.558659218	0.416666667	0.492610837	0.4	**0.466984**
CAPACITY	0.092178771	0.166666667	0.162561576	0.133333333	**0.138685**
					1

	CRITERIA				
TRANSPORTER	RELIABILITY	SPEED	SECURITY	CAPACITY	
I	0 320338186	0 405687779	0 142857143	0 653169104	RELIABILI
N	0 567343057	0 479781853	0 285714286	0 250315427	x SPEED
S	0 122318747	0 114550368	0 571428571	0 096515208	SECURITY
					CAPACITY

PREF VECTOR FOR CRITERIA

TRANSPORTER	SCORE	RANKING
I	0 290406892	3
N	0 381742009	1
S	0 327849098	2

C