UNIVERSITY OF AGDER

# Impact of the design of Logistics Outsourcing strategy on the firm´s logistic performance

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**Supervisor**
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*This Master's Thesis is carried out as a part of the education at the University of Agder and is therefore approved as a part of this education. However, this does not imply that the University answers for the methods that are used or the conclusions that are drawn.*

University of Agder, 2011

Faculty of Economics and Social Sciences

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# Chapter One:Introduction

## 1.1 Motivation and research problem

In the reign of economic, political, environmental and regulatory reforms, most firms are bound to modify their business operations and be able to keep abreast with the drift. As one of key decisions to be made in this process, firms would need to redesign their supply chain networks which basically involve re-configuration of their logistic activities. These include transportation, warehousing, freight forwarding and value adding services like packaging and labeling. Depending on the changes in regulatory and political environment, nature of the firm and type of industry, such decisions are made on occasional or routine basis.

For the last two decades, outsourcing of logistics services has been one of the most popular logistic decisions (Knemeyer & Murphy, 2005). Firms embark on this relatively new strategy by using Third Party Logistics (3PLs) and/or Fourth Party Logistics (4PLs) as their source of logistics services instead of sourcing them internally. Abdullah, Mohamed, Othman, & Uli, (2009) argue that at the moment firms tend to outsource their manufacturing activities than how they did a decade ago. The decisions involved in assessing whether to outsource or not are in line with the popular make-or-buy decisions.

Even though 3PLs outsourcing is a relatively new practice, significant literatures on the topic are available. This is suggestive of the extent this topic is explored both, quantitatively and qualitatively.

In the same way, literatures indicate that 3PLs outsourcing is widely popular in Europe (Wilding & Juriado 2004), North America ( Lieb & Lieb 2009, Lieb 2008, Lieb & Butner 2007) and Asia Pacific region (Abdullah et al. 2009, Power et al. 2007 & Chen et al. 2010). On the other hand, less is known on 3PL outsourcing in other geographical regions including Africa. Globalization forces coupled with institutional and structural reforms that are embryonic in Africa pledge for a fast-tracked economic upsurge and opportunities in the continent. With its aggressive pursuing of economic and political integration, East Africa is one of the regions with such enormous development potential. Like other regions in Africa, it is rich in minerals and other natural resources. This makes it not only a critical source of raw materials for different industries but also a common market for local and global companies. As business networks grow and complexities in operations increases it is

absolutely important to understand challenges of doing business in the region. For firms aspiring to enter this market, it is imperative to get hold of this understanding and up to date knowledge on how to achieve relevant and finest logistic capabilities in the region.

Studies also have covered a wide range of industries including general manufacturing, consumer goods (Wilding & Juriado 2004), traditional retail, and online (e-commerce) retail.[1] However, only few or no literature is available on 3PL outsourcing in construction industry. At the heart of construction there is a cement industry which is very fundamental for any nation´s construction industry; this is because very few projects take place without utilizing cement somewhere in the design (Portland Cement Association, 2009). Cement is a fine powder made from processing of literally mountains of limestone, clay, cement rock, and other materials. Portland cement (or Ordinary Portland Cement) is the most common type of cement in general use in the world and it the basic ingredient in concrete, mortar, stucco, and most grouts (Admin, 2009).

In recent years, the demand for cement in East Africa and nearby countries has surged due to a relatively higher growth prospect in infrastructural development. Despite the effort by local manufacturers to exploit this growth by increasing their production capacity, the market has experienced an influx of new competitors from India and Pakistan who, in addition to low production cost, are allegedly importing subsidized cement (Omondi, 2010). The changes in the regional competitive dynamics therefore dictate for local manufacturers to devise avenues by which they can keep abreast with the new market dynamics and retain or increase their market share.

Construction, including manufacturing of Portland cement in specific, is a materials intensive industry. This, ceteris paribus, renders logistics with a critical role in determining operational and financial successes for a typical firm in the industry.

While various logistics designs present opportunities to reduce cost and increase customer services to all players in the industry, firm specific strategies are the ones that uniquely contribute to distinctive performance. In 3PL outsourcing, the strategies are in terms of scope translated as depth and width of outsourced activities, number of service providers,

and length of outsourcing relationships. This study therefore intends to explore strategies in 3PL outsourcing by Portland cement manufacturers and how they impact their logistics performance. It attempts to understand the justification for the outsourcing option rather than internal development; to familiarize with nature and scope of logistics functions outsourced by these firms and strategies used to initiate and manage successful relationship with 3PL service providers. In this study, specific attention is drawn on regional specific attributes of 3PL outsourcing ranging from opportunities, challenges and approaches.

## 1.2 Objective of the study

Various facets of a 3PL topic have been covered in the previous studies; these include 3PL outsourcing process (Mello et al. 2008 and Jharkhariaa & Shankarb, 2007), drivers of outsourcing decision (Rao & Young, 1994), satisfaction and perception of customers on performance of their 3PL service providers (Power et al. 2007), customer-provider collaborative relationships (Hofer et al. 2009), types of outsourced logistic activities, evolution of 3PL and 4PL industry, and impact of using 3PL on firm performances.

Since very little is known on how 3PL outsourcing is practiced in the cement industry in East Africa, the main objective of this study is to understand the current status of the move toward outsourcing of third party logistics (3PLs) services and how this impacts logistics performance. As it is presented in the theoretical model, this study will focus around three main areas: degree of 3PL/4PL outsourcing, ability to determine capabilities of 3PL/4PL service providers and level of collaboration with these providers as the main parameters under investigation. It also attempt to find out how these parameters impact logistics performances of the client organization. The study therefore seeks to answer the following research questions:

## 1.3 Rationale for studying logistics in the cement industry

Portland cement is a homogeneous product and therefore, from the customer perspective, there is essentially no difference in physical characteristics, quality, and benefits between bags of cement from different manufacturers vying with each other in the market. In addition to cement, other products in this category include steel, coal, and fresh fruits. As a result of lacking any competitive distinction at present, companies in the cement industry competes on price and customer services or availability. Therefore, logistics is considered

to be a critical battlefield where companies with well crafted strategies can beat their competitors in terms of operation costs and coverage or customer service.

## 1.4 Research questions

What are the rationales for 3PL outsourcing by Portland cement manufacturers and how their different achieve consensus to pursue this option?

How do Portland cement manufacturers design their logistics outsourcing strategy (with regard to scope and type of activities to outsource length of relationship with 3PL providers and proportion of logistics budget outsourced)?

How Portland cement manufacturers facilitate collaborative relationships with their logistics services providers? What challenges are involved and to what extent these efforts are successful?

How does 3PL outsourcing option impacts logistics performance in Portland cement manufacturing industry in East Africa.

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# Chapter Two:Literature Review

## 2.1 Introduction to Logistics (3PL and 4PL) outsourcing

As we have seen in the previous chapter, Logistic outsourcing is an evolving strategy and already there are various concepts under development to reflect the dynamics in the industry. Since 3PL and 4PL are so far the most popular concepts, this section will briefly discuss them, highlight their basic differences and establish the intended connotation when the terms are used down the road in this project. Furthermore, it is not the intention of this study to categorize companies on the basis of their preference of either 3PL or 4PL but to. However, the use of one or both makes provide a meaningful parameter in characterizing a company´s logistics outsourcing design.

### *2.1.1 Third party logistics (3PLs)*

Third party logistics (3PLs) outsourcing is defined in many different ways by different authors as they deem it appropriate to suit their explanation of this evolving management philosophy or a particular context under their examination. The variations in the definition are mainly in terms of degree of formalization, scope of outsourced activities, financial arrangements and length of the resulting relationships between a firm and its 3PL providers. These on the whole provide parameters by which 3PL outsourcing practices can be assessed and variations between various approaches, if any, are identified.

In their legalistic perspective, La Londe & Cooper (1989) provide some illumination on how formal the relationship has to be. Referring to it as “contract logistics”, they define 3PL outsourcing as a process whereby a shipper and 3PL provider enter into an agreement for specific services at specific costs over some identifiable time horizon. This is further brightened up by Murphy and Poist (2000) who, after going over a number of literatures, defined 3PL as: “a relationship betweena shipper and third party which, compared with basic services, has more customized offerings, encompasses a broader number of service functions and is characterized by a long term, mutually beneficial relationship”.

### *2.1.2 Fourth Party Logistics (4PLs)*

Another possible variation in the use of externally sourced services by the cement firms is the use of fourth party logistics (4PL) or lead logistics providers (LLPs). After many years

of firms outsourcing their logistics services to third parties, concerns were raised by both parties on the unsatisfactory level of services and lack of pro-activity by service providers and failure of customers to share their supply chain information. This rose up the idea of using an additional enterprise or organization to oversee and take the responsibility for all the outsourced operations a user might have (Buyukozkan, Feyzioglu, & Ersoy, 2009).

Fourth party logistics (4PL) is a term copyrighted by Accenture, a giant consulting company, who also defined it as an integrator that assembles its own and other organizations´ resources, capabilities, and technologies to design, build and run a comprehensive supply chain solutions. Revisiting this definition, Walton (2010) described a 4PL as a company that manages logistics operations with the use of subcontractors and without running its own trucks on the contract. In one of the series of longitudinal survey administered to North American third party industry, Lieb & Lieb (2010) observed that CEOs of these companies expect more businesses to go to 4PL and Lead logistic Providers (LLPs)

Putting it in a simple form, a 4PL is a company that manages logistics operations combining and using logistics assets like trucks or warehouses from other operators with none of little its own assets. The term Lead Logistic Provider (LLP) is used when a major portion of the assets come from the aggregator with supplement coming from other providers.

## 2.2 Rationale for Logistics services outsourcing

Logistic decisions of the firm are driven and justified by a various factors including, among others, the need to achieve operational flexibility, customer service, risk mitigation, cost reductions, operational efficiency and access to resources and markets. It is argued that out of these many factors, cost reduction and expectation to improve services are the most frequantly cited factors for outsourcing (Mello, Stank, & Esper, 2008).

To gain a better understanding of the rationales for logistics outsourcing, it is important to organize driving factors in some major categories. Since supply chain redesigining goes together with environmental changes and internal profile of the firm, the major categories that can best represent this setting are strategic, operational, financial, and environmental

factors. Furthermore, these are the the main areas where outsourcing firms anticipate potential gain from their reltionships with 3PLs.

### *2.2.1 Strategic factors*

Outsourcing provides opportunities to focus on core competences. Sink & Langley (1997) argue that it is a viable business strategy since handing over non core functions to 3PL service providers enables the management to leverage its resources, spread risks, and concentrate resources in issues critical to survival and future growth. Likewise, the role of logistics functions in areas such as sourcing, manufacturing, and distribution activities is prone to the influence of strategic decisions such as development of core capabilities and discarding of business segments or functions (Rao & Young, 1994).

### *2.2.2 Operational factors*

In the assessment of whether or not to outsource, operational complexity can be considered as one of the core determining factors. In their assessment of factors influencing outsourcing of logistic functions in global supply chains, Rao & Young (1994) identified logistic complexity as a representative term for collective impact of characteristics of the outsourcing firm´s business profile. They went further breaking this down into network complexity, process complexity and product complexity.

The need to achieve a larger geographical coverage, efficient information and communication systems, market relationships and to provide higher level of customer services all contribute to outsourcing decisions. A higher level of operational flexibility is also needed to cope with fast changing business environment, shorter product life cycles and ever increasing pressure due to changing patterns in market demand and customer expectation. The cost of investing in internal logistical assets is not only very high but also the resulting level of fixed assets tend to lock the company in a certain way and reduce operational flexibility. Many other authors therefore have pointed achievement of operational flexibility as an important reason in outsourcing 3PLs (Boyson, Corsi, Dresner, & Rabinovich 1999, Fernie 1999, Laarhoven, Berglund, & Peters 2000).

### *2.2.3 Financial factors*

As one of the main goals in business decisions is to achieve and maintain a higher profitability; growth in revenues and cost reduction therefore are apparently the main targets in logistic design decisions. Many authors agree that cost reduction is a single or one of the most important reasons for logistic outsourcing decisions (Berglund, & Peters 2000, Boyson, Corsi, Dresner, & Rabinovich 1999, Fernie 1999, Laarhoven). Furthermore, it is argued that critical to deciding whether to maintain a logistic function in-house is whether it provides cost-effective service at a quality level competitive in the market (Rao & Young, 1994). However, logistics activities are not always considered to be value producing functions and thus there are often limited corporate resources for having dedicated fixed investment in them (Sink & Langley, 1997).

Wilding & Juriado (2004) in their survey of consumer good companies in Europe came up with a slightly different view as they found out that competence of 3PLs (56%) and operational flexibility (54%) slightly overlie cost reduction(54%) as the most common reasons for outsourcing. To support this, they raise the arguments that the primary business focus is customer service and not cost, cost is only a qualifying and not a winning factor and that the profit margin charged by 3PLs limit their ability to reduce cost.

### *2.2.4 Environmental factors*

Changes in regulatory environment may also prompt companies to alter parts of their business model or completely redesign it. Some firms express willingness to outsource most of their logistics activities but wants to retain those activities in-house when hazardous materials or other controlled items (such as pharmaceutical or defense-related goods) are involved (Rao & Young, 1994).

This section raises specific issue to be considered by Portland cement manufacturers on the rationale for 3PL outsourcing in the industry. From the literature, one of the issues is whether or not they consider their business operations as complex enough to justify outsourcing logistics capabilities to external 3PL providers in order to achieve operational flexibility. Another issue is on whether or not they consider their logistics functions as non-core in this industry; this also may justify relieving the management of this task so that they

can concentrate on more core issues. These issues together with cost-benefit analysis under finances lead us to our next research question:

> **Question 2***: What are the rationales for 3PL outsourcing in Portland cement industry and how different functions in the Portland cement manufacturing organizations achieve consensus to pursue this option?*

## 2.3 Scope of Logistics outsourcing

Companies outsource to solve a specific problem, improve performance, or achieve any other goal fitting their needs. At the same time, why a company would outsource logistics functions is as important as how they would strategize its execution. From the 3PL and 4PL definitions in the previous sections we get at least 4 important features of a logistics outsourcing design: nature or type of outsourced logistics activities; number of outsourced activities; proportion of budget outsourced; and length of outsourcing relationships.

### *2.3.1 Type of outsourced Logistic services*

About scope of activities, 3PL outsourcing does not necessarily mean overhauling the whole logistic system. Sink and Langley (1997) define third party logistic outsourcing as the use of external service providers to perform some or all logistics functions that were traditionally performed internally by a firm. Millen et al. (1997) also advises that outsourcing should not be taken as "all or nothing" decision. These explanations indicate that most firms would settle with a design entailing outsourcing of only those logistics functions critical to addressing their specific or custom needs. As we have see, the nature, types and number of outsourced activities are presented in the definitions as important elements in 3PL outsourcing. Therefore, for the rest of this study, we will refer to these elements altogether as scope and this is going to be one of our important parameters in the assessment of 3PL outsourcing design.

After reviewing a number of academic literatures, Wilding & Juriado (2004) identified transport and shipement, warehousing and inventory control, Information system related, and value added services as the most outsourced logistic areas. In the meantime they surveyed the consumer good industry to understand customer perceptions on key outsourcing decisions and summarised their findings in a tabular fom as shown below:

**Table 1: Logistics functions most likely to be outsourced kept in-house or managed with mixed system (% of companies)**

| Logistics functions most commonly fully outsourced | Logistics functions most commonly managed as a mixed system | Logistics functions most commonly kept fully in-house |
|---|---|---|
| Primary transport – 68% | Additional storage during peak periods – 38% | Carrier selection –82% |
| Secondary transport – 52% | Storage during off peak periods – 34% | Storage during off peak periods – 44% |
| Additional storage during peak periods – 36% | Secondary transport – 30% | Logistics information systems – 78% |
| Fleet management – 36% | Primary transport – 22% | Returns and reverse logistics – 56% |
| Re-labeling and repackaging – – 26% | Returns and reverse logistics – 20% | Final product customization – 42 |

Source: Wilding & Juriado (2004)

### *2.3.2 Proportion of budget outsourced*

The share of Logistic budget outsourced is also a good static picture of the extent that firms outsource their logistics activities to 3PL or 4PL. If proper costing procedures are in place and the firms keep tracks of all logistics expenditures, including those in connection with 3PL, it is this is the percentage of total logistics budget that is covered by outsourced activities. In European consumer goods industry, the largest number of companies outsource between 30% and 50% of their logistic budget (Wilding & Juriado, 2004).

### *2.3.3 Length of outsourcing relationship*

Another important parameter explicitly indicated in the definitions is the length of outsourcing relationship. While the visited definitions present types, nature and number of outsourced activities as well as length of outsourcing agreements as necessary features in formal relationships between a firm and its 3PLs providers, they apparently waver on including basic logistics services. The excluded services are normally general, informal and characterized by arms length or also known as transactional logistic contracts.

It may be assumed that 3PL outsourcing in East Africa is in its inception stage and therefore expected to have a supply market which is served by relatively small independent providers making it highly fragmented. If this is the case, the cement manufacturers are probably engaged in short transactional outsourcing contracts which according to the definitions presented here are basic and thus excluded from the category of 3PL outsourcing relationships. However, if these functions are permanently outsourced and if the transitional contracts are repeatedly used, the exclusion of these relationships may be mainly based on mere jargons and not the actual business processes as implied.

This therefore indicates that a choice and nature of logistics services provider is another important feature or parameter in the assessment of 3PL outsourcing design.

Nearly all large multinational companies tend to make use of third-party logistics providers. (Murphy, et al., 1991). The extent that firms outsource their logistic activities depends on the nature of activities themselves, availability of logistic providers with those capabilities, availability of internal capabilities, nature of industry and other cost benefit analysis. The two possible ways to establish the extent that firms outsource their logistics functions is by assessing the type and proportion of activities outsourced in these firms and identifying the share of logistic budget outsourced to external providers.

One of the objectives of this study is to identify and assess the most common outsourcing strategies and how they impact logistic performance in the industry. The discussions above derive 3 important features to be considered in a logistics outsourcing design. In the light of these, we can therefore introduce our first research question:

> **Question 2**: *How Portland cement manufacturers design their logistics outsourcing with regard to factors like scope and type of activities to outsource, length of relationship with 3PL providers and proportion of logistics budget outsourced.*

### 2.4 Collaborative relationship with 3PL service provider

Attaining a collaborative relationship is indispensable for improving logistics performance of a 3PL outsourcing organization. Studies indicate that there is an increasing recognition that firms need to manage closer, longer term relationships with their suppliers or service providers (Golic & Mentzer, 2006). It is also argued that outsourcing companies that are embedded in collaboration relationships with 3PL´s or 4PL´s have been found to

experience higher levels of trust and commitment (Paul, Knemeyer, & Thomas, 2003). However, there many challenges on the way that not all firms are able to successfully realize the benefits of business to business collaborations.

In their annual survey of CEOs of the largest 3PL providers in North America, Lieb & Butner (2007) identified a number of challenges experienced by these organizations in establishing collaborative relationship with their client organzations in a survey that was conducted in 2006. Although the CEOs communucated them as challenges, they practically stand for important issues to consider when developing effective relationship strategies. Most of these issues touch specific areas of the organization like functions, process or the whole organizational structure. For easy understanding they can be grouped into 4 major categories (factors): Top management commitment, Organizational issues, Trust and perception issues and Resource availability.

### *2.4.1 Top management commitment*

The first factor to consider in developing collaborative relationships with logistics providers is the commitment of top mgt in the client organization (Laarhoven, Berglund, & Peters, 2000). Lack of this commitment organization can be a source of many problems since the top management is for many important decisions including approval of needed resources, monitoring of performances and providing leadership in ensuring organization goals are reached. Many other issues are related to top management commitment; these are together with lack of willingness to spend time necessary to develop relationships and changes in leadership at the client organization. While relationships cannot improve without any further effort and time from the parties, change in leadership may impact original vision and strategies in the client organization. If the new leadership has different opinion, the relationships with logistics providers may be exposed to risks.

### *2.4.2 Organizational factors*

Organizational factors are those related to the structure and processes within the client organization. One of important elements under this category is the choice of point(s) of contact for 3PL or 4PL providers (Lieb & Butner, 2007). Having multiple contact points within the client organization may bring confusion and result into failures to strengthen existing relationships or break down of the same. Another element is the tendency to

excessively use consultants in managing bid processes; if carelessly utilized, these get in the way of collaboration and create bottlenecks between the service providers and client. Consensus within client organization is also one of important elements in establishing relationships with logistics providers. There is therefore a need for organization to have a well defined techniques or procedures on how to achieve consensus.

### *2.4.3 Perception and Trust*

Collaborative relationships require a high level of trust as the parties to the relationship may need to share some sensitive information as a means of achieving specified goals (Lieb & Butner, 2007). Lack of trust may trigger opportunistic behavior that may lead to both parties to lose. Some client organization may have perception that 3PLs and 4PLs basically provide services and therefore cannot become strategic partners (shopping on transaction basis and procurement instead of supply chain orientation). There are also organizational biases against collaborative relationship with vendors; these may cause risk-reward imbalance and lack of precise performance metrics.

Perception and level of trust may also be the result of the organization´s past experiences in relating to its business partners or its orientation towards relationship marketing with its own customers. This means that, firms with more experience in partnering with 3PLs probably have more realistic expectations and greater capability of sustaining close, interactive relationships with other 3PLs (Hofer, Knemeyer, & Dresner, 2009).

### *2.4.4 Resources*

Some organization may just fail to take full advantage of 3PL or 4PL outsourcing as a result of lack of necessary resources to support real collaboration. The resources may be financial, labor or technological resources like an adequate information system depending on the nature of the organization. For successful outsourcing relationships there is a need to orchestrate necessary resources and facilitate collaboration; this has to be done on time and at the level that matches requirements over the life of the relationship.

As we have seen, all these factors and their related elements are critical for a successful collaborative relationship between a client organization and its external logistics providers. Since different client organizations have different goals and face different level of

challenges in their effort to establishing collaborative relationships with service providers, most would calibrate these factors in such a way as to meet their specific needs. One inevitable outcome from these calibrations is availability of variety of strategies that organization pursue to facilitate collaborative relationship with their 3PL and 4PL providers. Our next research question therefore is on how manufacturers in the Portland cement industry develop strategies to facilitate its collaboration with its logistics services providers.

> **Question 3:** *How Portland cement manufacturers facilitate collaborative relationships with its logistics services providers? What challenges are involved and to what extent these efforts are successful?*

### 2.5 Capabilities of 3PL and 4PL services providers

With all the array of 3PL´s and 4PL´s in the supply market, the challenge of identifying and collaborating with the best service provider is left with the firm that seek to outsource their logistics functions. This becomes even harder when most providers claim to position themselves as having the necessary capabilities to meet customer needs. How an outsourcing firm determines whether its logistics providers have these capabilities is an important parameter in determining its success in 3PL /4PL outsourcing.

In tackling these challenges, several possible approaches have been studied and developed; these include provider selection processes and selection criteria. Some of existing approaches for provider selection include Analytic Hierarchy Process (AHP) and Analytic Network Process (ANP).

Jharkhariaa & Shankarb (2007) recommend the use of ANP over AHP and describe it as a less popular but with more ability to capture interdepences among different decision attributes. In their paper, Selection of logistics Service provider: Analytic Network Process (ANP) approach, they present a 9 steps provider selection model with three level of criterias: determinants, dimensions, and enablers, in a decending order . In this model, Dimensions represent compatibility, cost, quality and Reputation while dimensions stand for subcriteria such as Long term relationship, operational performance,financial performance, and risk management. The methodolody to use in this model include the following stepts:

- Develop a team of competitive managers
- Define service and distribution objectives
- Develop distribution and functional specifications
- Identify potential providers
- Development and evaluation of request for information (RFI)
- Develop request for proposal (RFP)
- Evaluate RFP responses
- Field visit and inspection
- Final selection and Service agreement

While first 8 steps make a framework for initial screening, the final selection of provider in this model is determined in the last step. This is where the ANP methodology is actually applied by comparing shortlisted providers based on dimensions, determinants and enablers and interdepence among them.

### 2.6 Contribution of 3PL services in firms´ logistics performance.

Undoubtedly, the ultimate goal of logistic outsourcing is improving logistic performance. This therefore calls for logistic outsourcing firms to keep track of their logistic performance starting with whether 3PLs deliver up to, below, or above the expected level and whether a firm experiences any significant progress from its outsourcing strategy. How to determine the extent that this goal is reached and whether using 3PL providers is an appropriate strategy is therefore an important challenge to be addressed.

A quantitative measurement based on key performance indicators (KPIs) could perhaps be a more effective approach. On the other hand, logistics executives are directly responsible for outsourcing processes in most firms and therefore, as key informants, their assertions on the performance can reliably be used for some inkling on the impact of outsourcing in their business processes.

McMullan (1996) provides some important performance measurements that can be used as both, input for quantitative measurements and parameters for qualitative opinion by logistic executives. These are: Inventory accuracy, number of on-time shipments, Number of

incidences of customer complaints, Number of incidences of backorders, Warehouse cycle time, Number of kilos/unit shipped; and Number of dollars shipped.

From the customer perspective, different factors are cited as critical to success of logistic outsourcing. These include the capability to assess competing 3PL service providers and outsourcing options, appropriate contractual conditions, and effective monitoring of existing relationship (Boyson, Corsi, Dresner, & Rabinovich, 1999), close working relationships between trading partners and involvement of senior management (Laarhoven, Berglund, & Peters, 2000), clear definition of services and sharing information with 3PL about the company´s policies and requirements (Millen, Sohal, Dapiran, Lieb, & Van Wassenhove, 1997).

Exerting such a level of effort in designing logistics outsourcing approach will be of no meaning if the level of logistics performance is not improved or maintained at relatively high. Whether or not there is an optimal combination of scope of outsourced logistics functions, best 3PL providers and a good collaboration with providers should be determined on the basis of the end results in logistics operations.

As the case may be, all relevant criteria like lead time, costs, inventory levels, customer services and other capabilities need to come into play when assessing a firm´s performance in logistics. Managers executives are expected to keep track of performances bearing in mind all these indicators. Our main and last research question in this study therefore seeks to under understand how Logistics performance responds to the application of 3PL outsourcing in general and how each individual factor contributes in this performance.

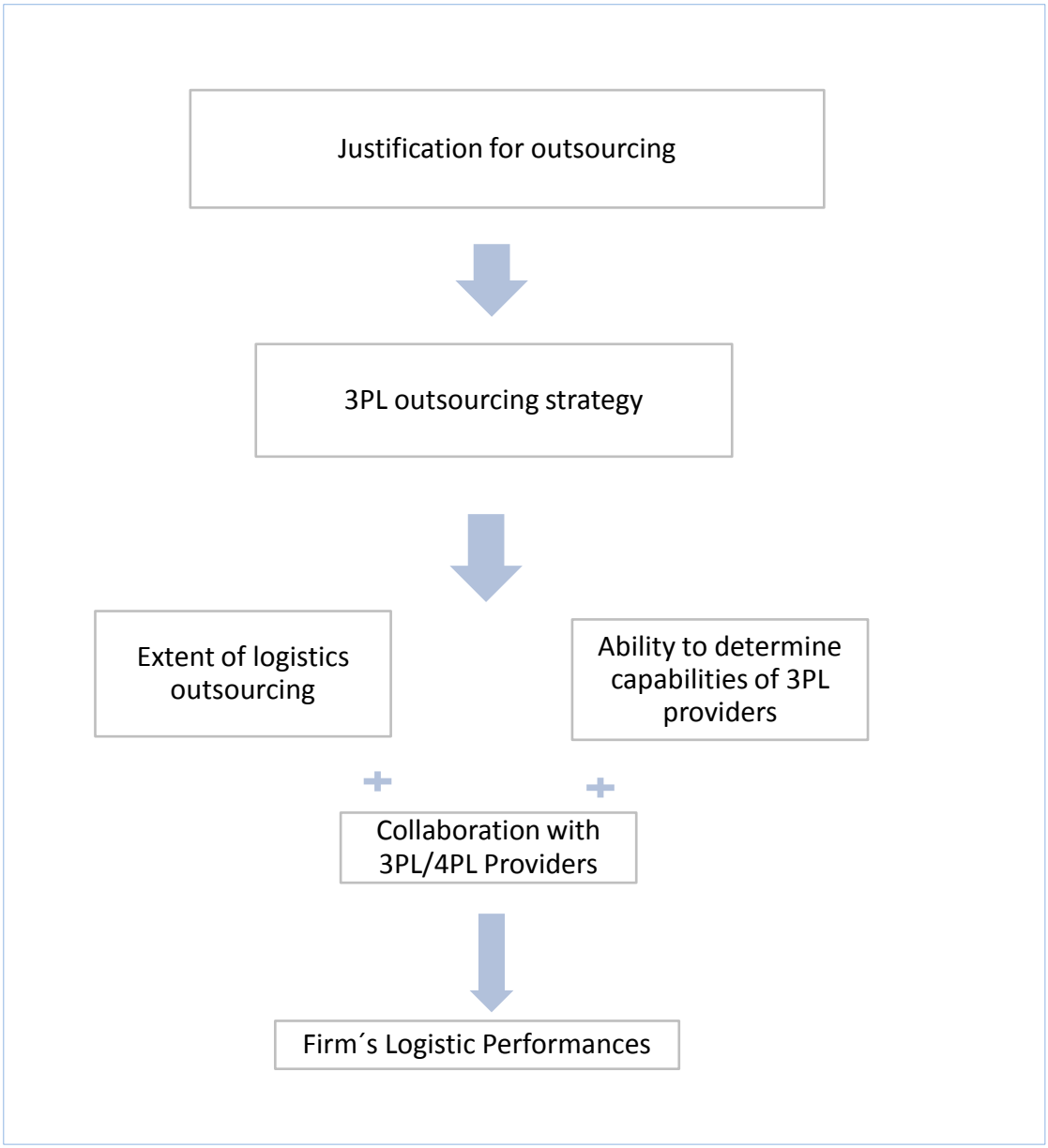
> **Question 4:** *How does 3PL outsourcing option impacts logistics performance in Portland cement manufacturing industry in East Africa? What is the contribution of different factors included in the logistic strategy?*

## 2.7 Conceptual Model

From the literature reviewed, the whole study is summarized in a conceptual model below which is comprised of key parameters such as justification for logistics outsourcing, formulation of outsourcing strategy, ability to determine the capabilities of logistic providers, collaboration with providers and firm´s logistics performance. Although a causal

relationship is implied, the main model is mainly intended to indicate interconnectedness of various issues core to the formulation of logistic outsourcing strategy as perceived by Portland cement manufacturing firms.

**Figure 1: Conceptual model**



# Chapter Three:Research Methodology

## 3.1 Introduction and study design

To exploit various opportunities provided by employing a case study design, this qualitative study involves an in-depth examination of how logistic outsourcing is practiced in Portland cement industry in East Africa. It involves analyzing how firms outsource their logistics functions to third party (3PL) and fourth Party (4PL) providers in the region and how they manage various challenges resulting from adhering to these options.

While quantitative studies points out to existing relationships between different variables of the phenomenon under investigation, qualitative studies help in deepening and expanding detailed knowledge of various attributes and parameters involved.

A case study is an intensive description and analysis of a single individual, group or in this case firms in Portland cement industry which is our unit of analysis. It facilitates understanding of complex issues and increases our understanding and experience of what is already known through previous research (Soy, 1997). Since very little or none is known on the use of 3PLs and 4PLs in the region, the methodology present a number of advantages that can potentially make this study successful. The method present good opportunity to study rare phenomenon and is the best method to challenge theoretical assumptions. It is also a good source of idea about behavior of units under analysis and present opportunity for innovation in gathering empirical data.

As with other methods, case study method has its own flaws. Critics of this method believe that the study of few cases can offer no grounds for establishing reliability of findings and they cannot be generalized in other settings. Others feel that the method does not provide good opportunity to generate clear cause-effect type of relationships.

While a quantitative study generates findings through statistical or other quantitative methods, this design uses naturalistic approach that seeks to understand phenomena in context-specific settings where the researcher does not attempt to manipulate the phenomenon of interest" (Patton, 2001). Moreover, it seeks illumination, understanding, and extrapolation to similar situations while those following a quantitative approach seek causal determination, prediction and generalization of findings.

## 3.2 Scope of the study

The study will be limited to experiences of 3PL and/or 4PL customers among Portland cement manufacturers in East Africa. East African Community has five member states but for convenience, this study will use cement manufacturing firms in English speaking Tanzania, Kenya, and Uganda as a sampling frame and no attempt will be made to extend the study to Rwanda and Burundi.

## 3.3 Background of study industry and firms for case study

Portland cement or Ordinary Portland Cement (OPC) manufacturing activities in East Africa started in 1933 in Kenya, 1959 in Tanzania and 1952 in Uganda. Before that, most of construction works in the region depended on imports from India, UK, and China. Before privatization, most of these first plants were under parastatal ownership with all the ownership and management centralized to the government. Currently there are about ten active cement manufacturing plants in the region and few more are planned to launch their operations in the near future.

**Table 2: East African Cement Manufacturers**

| Country | Company Name | City/town | Capacity in 2009 | Existing Capacity |
|---|---|---|---|---|
| Cement Manufacturers in Kenya | Bamburi Cement | Mombasa | 2400 | 2400 |
| | East African Portland Cement Co. Ltd | Nairobi | 1400 | 1400 |
| | Athi River Mining (ARM)-Rhino cement producer | | 300 | 2100 |
| | Cemtech | | 1000 | 1000 |
| | National Cement | | 700 | 700 |
| Cement Manufacturers in Tanzania | Twiga Cement | Dar Es Salaam | 700 | 1400 |
| | Mbeya Cement | Mbeya | 250 | 250 |
| | Tanga Cement | Tanga | 750 | 1250 |
| Cement Manufacturers in Uganda | Tororo Cement LTD | Tororo | 700 | 1000 |
| | Hima Cement LTD | Kasese | 480 | 960 |

### 3.4 Study Population and unit of analysis

The target population includes all logistic executives, managers and department heads responsible for supply chain, warehousing, procurement and logistics functions in the currently active OPC manufacturing companies in East Africa. The unit of analysis is a cement manufacturing firm in East Africa. Since there are about 10 active manufacturers of Portland cement in the region and therefore, it is easier to assume right now that the study population is approximately of the same number. Availability and accessibility of these executives will determine the final size of study population.

### 3.5 Sampling technique and sample size

Convenience sampling technique will be applied and therefore, potential respondents are those who are will be easily available because of proximity, and availability of their emails addresses, phone numbers and other contact information. About 3 to 5 respondents will be picked for this purpose and the plan is to get at least one respondent from each of the countries in East Africa.

### 3.6 Research questions

The academic literatures covered in chapter 2 were intended to reveal relevant attributes of logistic outsourcing that can be analyzed in this study. The number of attributes identified is enormously large and therefore, this study will focus in only a few of them as summarized in the theoretical model in the previous chapter. These are covered in the following specific questions:

- How companies in the cement industry determine their best possible 3PL outsourcing strategy in terms of scope of outsourced activities, length of relationship with 3PL providers, and proportion of logistic budget outsourced?
- What are the rationales for 3PL outsourcing by Portland cement manufacturers; how different functions in the organization achieve consensus in pursuing this option?
- How manufacturers of Portland cement develop strategies to facilitate collaborative relationships with their logistics services providers? What challenges are involved and to what extent these efforts are successful?

- To what extent logistics outsourcing contributes to companies' logistic performance?

### 3.7 Data gathering and analysis technique

A comprehensive list of open ended questions which will be based on research questions in section 3.6 will be prepared. This tool will be a useful guide for a semi structured interviews to be conducted over the telephone. Respondents will first be contacted through their email and asked their willingness to participate in this study. To increase the chances of getting adequate and accurate responses, the questions will be mailed electronically to the respondents who are willing to participate. This will provide them with advance understanding of the questions and the subject matter.

Mostly primary data will be collected and these will be analyzed qualitatively and in some instances the use of simple statistical measures like mean, mode, median, tabulation and percentage might be permitted to aid in analysis and describing the findings

### 3.8 Reliability and Validity of findings

While reliability and validity denotes two different ideas in quantitative research they are mainly regarded as inseparable in qualitative research (Bashir, Afzal, & Azeem, 2008). Reliability is an idea that the conducted test or study gives the same result if repeated elsewhere; it is the estimation of consistence of the tools in the same settings and subject or the measure of repeatability of the measurement.

Findings of a study are considered as valid if the measurement instruments are reliable. Validity itself is the measure of trustworthiness or strength of the findings or conclusion; if there is any arrangements or approaches that increase our confidence on the originality and truthfulness of the result, we call that our reliability measure.

Different from their use in quantitative research, both reliability and validity are encompassed when terms like credibility, precision and transferability are used in qualitative researches; these terms are regarded as more effective in providing the lenses for evaluating the findings of a qualitative research like this (Golafshani, 2003). To a large extent, this is because the issue of replicability of results is not of concern for qualitative researchers.

In a case study design it is the quality of the researcher or observer that determines reliability. Again, this design provides opportunity to collect data from more than one source and therefore the resulting triangulation will help to search for convergence. Creswell & Milner(2000) defined triangulation as a "validity procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study". Use of triangulation, as Patton (2001) backed it, helps to strengthen a study by combining methods.

In this study, more than one Portland cement manufacturing company is analyzed and, in each company, opinions of executives from different department are solicited. The question of reliability and validity is therefore solved by the resulting convergence which increases credibility, trustworthiness, quality and strengthen the quality of the study. For further confirmation of the findings, the researcher uses other sources of information like company reports, websites, and opinions of other stakeholders in the industry.

# Chapter Four: Findings, Analysis and Discussions

## 4.1 Introduction

This chapter answers each of our research questions as defined in the previous sections but first provides the general but current overview of the cement and logistic industry in East Africa. It is organized in six sections; first section covers the structure and dynamics of the market including the size, production capacity, competition and industry growth prospect and a snapshot of logistics operations in the region. The subsequent sections are intended to answer each of our research questions including scope of outsourced functions in the second section, rationale for outsourcing in the third, collaboration with service providers in the fourth, determination of providers' capabilities the fifth and firms´ logistic performance in the last section.

## 4.2 Cement Industry overview in East Africa

### *4.2.1 Handling of Portland cement*

Limestone is one of the key raw materials for cement production. For most cement producers and suppliers in East Africa, limestone is readily available within the region and often times it is in proximity to where the plants are located. Other regular supplies items for cement companies are cement bags; these are mostly sourced from external manufacturers.

Portland cement is a moisture-sensitive material requiring dry storage conditions to retain its quality for an indefinite period. This stipulates for specialized storage conditions including shaded storage areas like warehouses without cracks or openings and, for outdoor storage of bagged cement, pallets and waterproof covering. Unless effort is exercised to avoid it from coming into contact with damp air or moisture, Portland cement will end up with less strength than the one which is kept dry ( Federal Highway Administration, 2011).

Care for cement quality is also necessary during its transportation from production sites to the storage areas through trucks and other means in the distribution system. Water proof containers or trucks are needed for cement transportation, this is whether the service is provided internally or outsourced to 3PL providers. The same applies for storage of bulk

cement which has to be in watertight bin or silo and whose transportation requires vehicles with watertight, properly sealed lids ( Federal Highway Administration, 2011).

### *4.2.2 The structure of the industry and growth prospect*

The cement industry in East Africa shows great signs of growth including an increase in demand, number of players, and production capacity. In average, the market annual growth rate is more than 12-13%; this is more than twice as much as the corresponding GDP growth (which is slightly above than 5%). The demand grew at a higher rate before the economic slump in 2008; after the upturn, growth resumed and cement consumption now grows at 13-14% rate in Kenya and at 15% in Tanzania (Mwangi, 2011). In general, the regional demand for Portland cement exceeds existing production capacity.

Different factors account for such a high growth in cement consumption in the region. One such factor can be the expansion of middle class and their disposable income. This is coupled with increased urbanization and the fact that most East African governments plan to increase development expenditure like building roads and other infrastructures. Also to keep abreast with urbanization, most individuals are venture into building their premises for shelter and businesses.

Anticipation of growth to result from a new country of South Sudan has also been cited as one of important trigger of growth in production capacity. This is because of potential effort to build infrastructures and urbanization which is only possible following restoration of order and peace in the country.

The Production capacity grew by nearly 30% during the past 3 years (Mwangi, 2011). This is not only from plants installed by new entrants but also from existing companies that expanded their production capacity. About 10 players are already operating and many more are expected to join the market in the days to come. While new comers like National Cement and Cemtech in Kenya have started cement production and are up competing for the market, Dangote from Nigeria has also started installation of its 2.0 metric tons plant in Tanzania. Other possible new entrants are expected from India and China.

Not only that existing players increase capacity but they also grow geographically. This is either by opening new plants in new regions or establishing distribution centers targeting

new markets. Most companies also target the market in nearby countries of Rwanda, Burundi and Congo.

The market has become increasingly attractive to multinational companies (MNCs) like Lafarge group and Heidelberg cement who fully or partially own some of the companies already operating in the region. This is because, at the moment, MNCs obtain a relatively larger share of their annual operating income from operating in emerging markets including East Africa than elsewhere.

### *4.2.3 Competition*

In addition to competition from existing local producers and new entrants, the market has also attracted imports from India, Pakistan and China. Imported cement is sold much cheaper than the locally produced one and this has hurt local producers. However, there are arguments that some exporters, like those in Pakistan, receive transport cost subsidies from their government making it possible for bulky imports such as cement to favorably compete in East African markets. Having very high production cost and experiencing severe inconsistence in energy, local manufacturers find it so difficult to compete with such imports. In response to this, local manufacturers through East Africa Cement Producers Association (EACPA), push for regulators to charge higher tariffs on cement imports suggesting an increase from 25% to 35% to level the playing field (Omondi, 2011).

Although all three East African countries- Kenya, Tanzania, and Uganda have several producers, cement has been traded across borders between these countries and only Kenya has witnessed a net export of cement. Tanzania and Uganda are so far the net importers. Before the formalities to institute The East African integration, differential prices between the countries mattered less to producers and consumers as well. However, the economic integration initiatives in the region have facilitated a borderless intra regional trade which allow for a low cost flow of commodities between countries and therefore intensifies price competition.

### *4.2.4 Market segmentation*

Logistic strategies for cement industries vary with the level of effort that is needed to serve different market segments. This is because of great disparity in the availability of necessary

infrastructures like railways, roads, bridges, ports, warehouses, silos trucks and other distribution assets in different geographical regions; these eventually impact logistics costs. Cement markets in East Africa are generally segmented based on two major criteria; these are either by the nature of the purchase or by geographical region.

By nature of the purchase, cement market has two main segments namely industrial market and consumer market. The Industrial market includes large industries or major construction projects where cement is bought in bulk. On the other hand, the consumer market includes individual customers buying cement for construction of residential structures and who mostly buy in 50 Kg bags. In East Africa, the consumer market segment is the largest accounting for more than 90% of cement business while the industrial market segment account for only less than 10% of the business.

On the basis of geographical location, segmentation of market is mainly natural in East Africa. Therefore, several market segments are available on country by country and on region by region within each country. From the companies' perspective, these markets are grouped into two major categories – the near market and the far market depending on the location of production plants.

As unspoken rule, most companies would target demand in geographical regions within a specified circumference from their plants as their designated market while serving the distant ones only when this demand plummet. Mbeya cement, a Lafarge group subsidiary, for instance targets a market in and around southern part of Tanzania; they serve Dar es Salaam and other distant markets only in March and April when demand in Southern Tanzania fall as a result of bad weather. Similarly, sales to other countries for a company operating in one country say Tanzania, Kenya or Uganda is also opportunistic. If demand is sufficient in the country where the manufacturer of when considering selling in the other countries like Tanzania, Kenya, Uganda, Rwanda, and Burundi.

### 4.3 Justification and consensus for outsourcing

This section answers our question on the rationale for 3PL outsourcing; respondents from the companies were asked to explain the motive for using external logistic providers for logistic function they fully or partially outsource. The question reads as follows:

*What are the rationales for 3PL outsourcing in Portland cement industry and how different functions in the Portland cement manufacturing organizations achieve consensus to pursue this option?*

In answering the two parts of this question, the section will be organized in two different subsections – one for justification or rationales for outsourcing and the other section is for the second part on how companies achieve consensus in outsourcing.

### *4.3.1 Justification for outsourcing*

While four main factors were mentioned as the rationale for outsourcing logistics services to 3PL providers, cutting down costs and operational flexibility were the most frequently cited motives. Other justifications mentioned by respondents are saving management time that they can focus in core activities and spreading logistics risks and achieve flexibility.

Companies outsource their logistics functions to increase operational flexibility in the sense that they want to extend their market coverage, respond to customer requirements faster, and for new entrants to achieve a higher speed to the market than what their existing internal capability can achieve. Distribution may not be a very big challenge for companies that had previously been operating in the market. This is especially so if these companies run their own distribution networks and much more if this is in related businesses within construction industry logistics are very challenging for a novice or foreign player. An outsourcing strategy provides opportunities to overcome such barriers; potential entrants and companies confined in small market segments can therefore use 3PL capabilities and already established networks and reach far laid markets within a short period of time.

Extending distribution network using internal resources implies high investment in physical assets which is too costly for this industry because of high fixed costs. On the other hand, providers of 3PL services can easily leverage their distribution assets such that with less downtime they can provide this service at better cost. Asked why he thinks outsourcing would help reducing costs, a respondent from Mbeya Cement argues that, in addition to fixed costs of buying the trucks, there are maintenance costs, salaries for permanent truck drivers, and management costs for personnel dedicated to manage the assets.

Although logistics is a critical business function in the cement industry, there is no doubt that it is not their core business. For cement manufacturers in the region, this justifies employing a 3PL who is best placed to efficiently carry the function for them while releasing their management teams' time for other business functions core to the Mbeya Cement that they can do the best. A respondent from Mbeya Cement believes that by using 3PL their management team redeem important time that they can use to focus in other core activities. He cites pressure to have more advanced production technologies, environment or carbon footprint concerns and expansion of production capacities to meet an ever increasing demand as some of key issues requiring more of the management attention.

Outsourcing is also regarded as a means of spreading logistics risks and achieves operational stability as it is in Bamburi Cement. They achieve this by not outsourcing more than 40% of their logistic need to one provider but at the same time, not preferring a 3PL service provider to whom they will be the only "exclusive" client. This means that, they deliberately retain a portion of their logistic functions internally while using more than one 3PL providers for the rest.

#### *4.3.2 Achieving consensus for outsourcing*

In Bamburi Cement, all procurements are handled by a departments specialized in procurement of goods and services. The procurement experts would therefore liaise with user departments and, according to specifications given and the prevailing procurement regulation, go ahead to competitively select a 3PL who can satisfy identified needs in the company. Striking a consensus between employees and between organizational functions for this company is not a hard thing when all personnel, although not advocating for the outsourcing option, they understand its importance.

### 4.4 Outsourcing strategy

This section describes the scope of 3PL outsourcing and organization of logistics functions and operations for the cement industry within the region. It answers our second research question on:

*How do Portland cement manufacturers design their logistics outsourcing strategy?*

To answer this question the section is subdivided further each subsection covering the scope of activities outsourced, percentage of outsourced budget, number of 3PL providers contracted, and length of relationship with these providers.

### *4.4.1 Scope of services outsourced*

Supply Chain and logistics is in general a big function in the cement industry; it starts from procurement to physical distribution to final consumers of our products. Companies maintain Procurement dept, warehousing management department, production and distribution; all of them are active and vibrant, staffed at the appropriate level.

Diverse of materials as inputs and outputs would daily go through the industry supply chain. For example: Tanga cement is a company with production capacity of 1.25 tons per year which is a medium capacity in the region. By end of 2010, its cement production capacity was 3000tons/day and packing capacity is 3600tonnes/day. In addition to selling to in-country market the company´s exports to neighboring Rwanda and Burundi totaled more than 40,000 tons in 2010 (Tanga cement, 2010). Diverse materials go through this company´s supply chain as key daily inputs for this level of operations in the year 2010(Table 3).

**Table 3: Key daily inputs for cement production**

| Input | Quantity per day | Unit |
|---|---|---|
| Coal | 235 | tons |
| Fuel Oil | 5 | tons |
| Explosive | 600 | Kilograms |
| Bags for packaging | 60000 | Pcs |
| Gypsum | 160 | tons |
| Red soil | 270 | tons |
| Water | 1100 | m3 |

Source: Tanga cement Website

The supply chain network for the industry extends beyond the regions to countries in other continents. On the inbound logistics, companies deal with local and international suppliers based within the region and in other countries; Bamburi Cement, for example, deals with approximately 150 to 200 local suppliers and about 50 suppliers from overseas. Local

suppliers are mainly based in big cities like Kampala in Uganda, Nairobi in Kenya and Dar es Salaam in Tanzania. Recently, some suppliers have started opening offices in towns closer to the cement plants.

Most common logistic activities include procurement, production, warehousing, freight forwarding, port clearance and fleet management. With regard to scope of activities outsourced, there is no definite list as a rule of thumb in the region. Choice of activities to outsource depends on the company´s history - whether or not they had their own logistic system before, company´s size, and availability of such services to meet the company´s needs.

In almost all companies, production activities are done in-house where the producers and suppliers of cement own their own plants and retain production engineers and other production resources in-house.

Procurement activities are also largely run in-house by almost all companies. However it is important to note that some companies belong to the same parent company were they hold an integrated view of operations which involve consolidation of common purchases for the parent Mbeya Cement and the subsidiaries. This approach provide the companies with economy of scales and therefore cost saving in procurement and logistics. A France based, Lafarge Group of companies is a good example as it owns Hima Cement in Uganda, Bamburi Cement in Kenya and Mbeya Cement in Tanzania. Consolidated procurements done at Lafarge Group on behalf of companies operating in East Africa are therefore not considered as outsourced.

External 3PL service providers are also commonly contracted for freight forwarding, and customs clearance. Outsourcing companies would however maintain an in-house clearing and forwarding department to manage and liaison with the 3PL service providers; this is especially so for companies with operations away from the ports. During plant expansions cement manufacturers require specialized procurement and logistics in moving the plant, equipments and other tools to the production country; in this case the cement companies would outsource freight forwarders who would be dedicated for this task; these are mainly from the countries of origin.

Transportation is the most outsourced activity by the cement companies in the region. This is particularly so for outbound transportation where cement is forwarded to distribution depots. For inbound transportation most companies maintain a significant transportation and mining equipment capacity to move limestone, coal and other materials to the production facilities.

More than 50% of cement produced is directly forwarded to the regional depots or customers on daily basis. This helps to decongest central storage areas near the production sites and therefore eliminating any problem with storage at the plants.

Traditionally, companies that outsource storage capacity will at the same time maintain their own storage capacity in addition to what they outsource. This is because cement demand is seasonal in larger part of the market e.g. demand in consumer market slowdowns in rain seasons and peaks up in dry season. In Tanga Cement for example, although the storage during both the peak demand and off-peak demand periods is outsourced, the company still keeps some capacity in-house to cater for any extraordinary changes in demand.

### *4.4.2 Percentage of Logistic budget outsourced to external providers*

Companies in the region outsource a larger part of their logistics budget to 3PL service providers. All the three companies interviewed indicated that they outsource more than 60% of their logistic budget to external logistic service providers; this includes Tanga Cement that owns the largest share in Cement Distributors Limited, its exclusive distribution company, and therefore has adequate control on how the business is run.

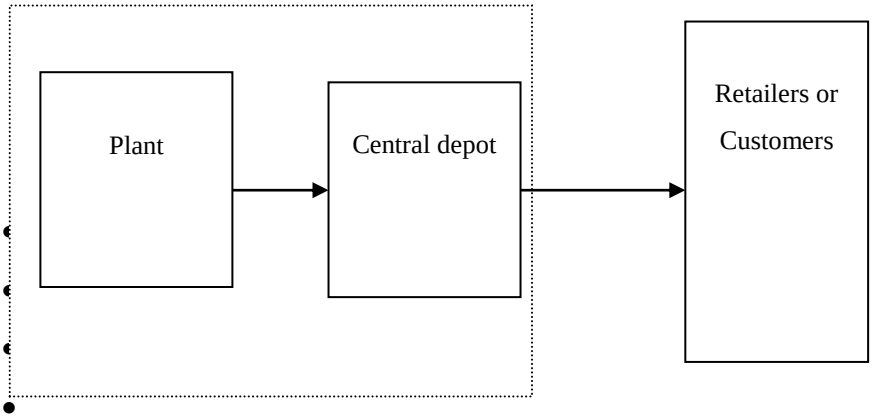
### *1.4.3 Number of service providers/ distribution services and sales*

Different companies use different distribution modes to reach the market with their cement. These vary depending on the whether or not a company use a 3PL, whether or not there are distribution depots and number of distribution depots. About four main distribution designs can be identified in the region.

*1.4.3.1 Indirect to consumer with a central in-house depot*

Through model a company would own one big distribution depot which is often placed next to the plant (Figure 2). Cement is distributed directly to customers through this depot. Most industrial market segments are saved using this mode.

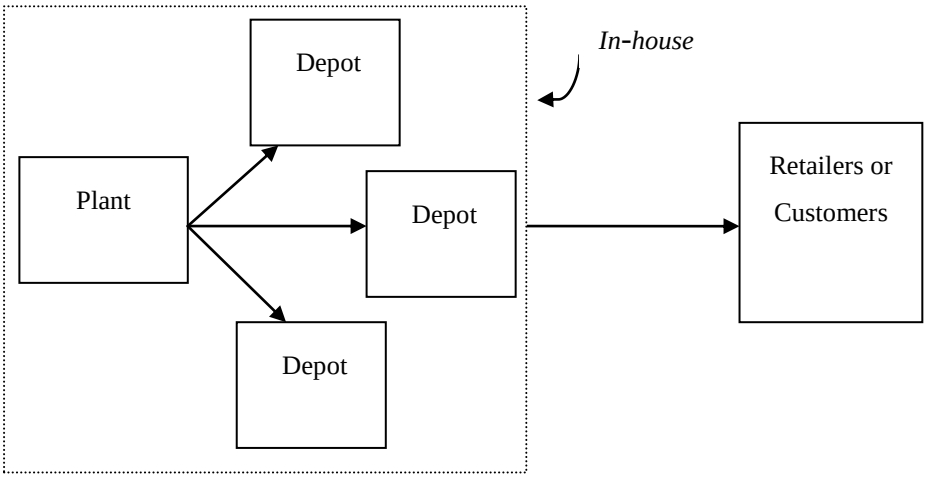
**Figure 2: Indirect to consumer distribution with a central in-house depot**




*1.4.3.2 Indirect to Consumer through in-house regional/ zonal Depots*

Through this mode, companies own more than one distribution depots positioned to target specific geographical markets. Customers would buy Portland cement directly from these zonal distribution depots (Figure 3). Tanga cement is the only company whose distribution system uses this mode. This is because of their ownership of the majority share of the Cement distribution company. However, since the distribution company is a separate entity, the logistics tasks are not actually done internally and therefore, their regular employees do not actually manage the logistics. A modified version of this model is when a company uses its own distribution depots but outsource transportation system to connect the depots to the central warehouse or the plant.

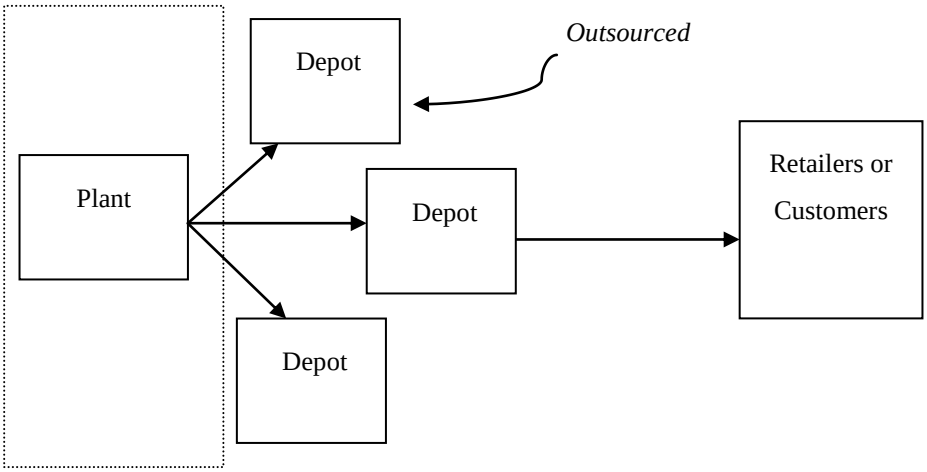
**Figure 3: Indirect to consumer through in-house regional depots**




*1.4.3.3 Indirect distribution to consumers via independent distributors (3rd part channel – transport and warehouses)*

This is when a cement company uses 3rd party distribution channel including trucks and depots to reach targets markets (Figure 4). Most firms in the region use this mode. Similar to the previous model, this model is in most cases modified where companies use their own distribution depots while outsourcing transportation.

**Figure 4: Indirect to consumer distribution through a network of 3PL channels**



#### *1.4.3.4 Direct – from plant to customers – especially for bulk cement to industrial customers*

As we have seen before, most industrial customers like large construction project are served directly from the plants (Figure 5). Bulk cement is transported in specialized Silos truck to the construction sites. Because of the specialized nature of these trucks, companies serving industrial customers would own them internally. This is because 3PL services providers don not have incentive to own this type of trucks because of the difficulties in using them for other businesses in the region.

**Figure 5: Direct to consumer distribution – for bulk cement to industrial cosnumer**


In outsourcing Transportation, number of outsourced 3PL providers would vary between companies depending on various factors including the company policy. To ensure that the best service is obtained, companies aim to narrow down the number of service providers to the manageable few. Bamburi Cement for example uses about 24 different transporters for distribution form the central depots to its 6 regional depots from which they serve their customers. They however intend to narrow down this number to 4 or 5 transporters. "Not only for control but to remain with only those who meet our needs especially safety issues", argues the Logistic manager for Mbeya Cement.

On the other hand, there is only one transportation service provider for Tanga Cement Corporation. This company owns about 40% share of the distribution company, the largest share so far. The company however distributes cement to all over Tanzania, Rwanda and Burundi. Tanga cement Limited has become the only cement manufacturer in Tanzania to control its own supply process from mining of raw materials through manufacturing,

packaging and transporting to the final destination; this came from the acquisition of a majority share in Cement Distributors (EA) Ltd (Westerberg, 2010)

Another company use different providers ensuring not more than 40% of their business in one provider but again not to become the sole client to a provider. "We normally would, for the purpose of business stability, want to spread risk by not having a service provider whose business with us forms the core of his activity. Neither do we want to put more than 40% of our business with one company"; argues the logistic manager in Tanga Cement. For Bamburi Cement, The number of service providers depends on the size of requirement relative to the capacity of existing providers and time limit to complete the task.

### 4.5 Determining and selecting a 3PL provider with needed capabilities

This section answer our research question on how companies determine the most capable 3PL provider for their operations and how they go about selecting this provider(s) from a host of other options. The question came from the awareness that most3PL providers in the region face many infrastructural challenges including lack of facilities, equipments and technical knowhow on solving clients' problems.

Analytical Hierarchy Process (AHP) is mainly used for analyzing and selecting long term partners in this industry; based on spreadsheet, this defines the objective to be achieve, the key criteria, and available option or choices. This is based on determining the relative priorities (weighting) of the criteria by pair wise comparison. This will answer the key question on "how many times is a criterion more important than another one?" In Mbeya Cement for example, the table with scale to answer the question is formulated just on Excel.

Standard procurement policy and procedures are used for procurement of 3PL services and other supplies; the companies send request for Information (RFI) or Request for Quotation (RFQ) and providers communicate their competences through the tender documents and quotations which show their qualities, capabilities, technical competency, financial ability and experience. Of the three companies interviewed, two (Tanga Cement and Bamburi Cement) indicated that they use these methods for solicitation of 3PL providers with capabilities needed.

Outsourcing or seeking service provider is the function of procurement department. Procurement department has to work in close liaison with the user department. In Bamburi Cement for instance, the user department comes up with the scope of what is to be done. Then the procurement sources for several outfits that can do the work. These departments then conduct interviews and selection is done.

According to Bamburi Cement, finding a competent service provider is very difficult and they are actually not easily available. “If we need the services of 3PL providers we need to get them from far; very few are available in the region (district) where we operates; this distance adds costs”; this is was the argument of the respondent in Bamburi Cement. Moreover, when providers are available, it is not always the case that they provide quality services and fulfill their obligation on time.

## 4.6 Collaboration with 3PL providers

The cement manufacturers in East Africa apply several methods to ensure collaborative relationships with 3PL providers. These are based on explicit contract terms, regular joint review meetings, provider development and opportunities for long term contracts.

### *4.6.1 Elaborate contracts*

In Tanga cement, collaboration with 3PL is determined by the elaborate contracts that are signed after long interviews. These contracts stipulate on how the client and 3PL service providers will collaborate over the course of contract. In the course of implementing the contracts, these terms are used as reference for measuring performance of both parties. Any deviations from these indicators are subjected to discussion and correction.

### *4.6.2 Provider development*

On the other hand, Mbeya cement regards service providers as partners, help to develop their capacity (transporters development program), train drivers on safety issues, agree on KPIs, negotiation and communication is preferred to litigation in case of provider´s failure to meet targets. However, the company does not rule using stricter rules to ensure compliance of agreed terms. For instance, it is only recently that the company and its 3PL

providers introduced penalties for late deliveries. It is only in extreme cases that contracts are terminated.

### *4.6.3 Joint review meetings*

Other approaches were mentioned by the companies as commonly used in ensuring collaborative relationship with suppliers. These are together with having review meetings with suppliers /service providers say in a quarterly basis.

As Tanga cement puts it, the purpose is to ensure that the relationship gets better; not to hurt each other, "if they get hurt they may also hurt us by refusing supplying critical items such as cement bags". During the meetings both parties get opportunities to raise their concerns about anything that do not go as expected or unforeseen incidences.

### *4.6.4 Long term contracts*

Almost all companies interviewed prefer contract length of 2 to 3 years for their 3PL service providers; this is with possible extension depending on the contractor performance. This facilitates organizational learning and building collaborative relationship that in the long run would benefit both parties.

For Tanga cement, most purchasing contracts with suppliers/service providers would last for 1 to 2 years. However, as indicated in the previous discussions, the company owns about 60% of all the shares of the company responsible for distributing its cement. They argue that in this ownership it is like they are having a permanent relationship with them.

Spot contracts are also common in the cement industry in the region. For instance, the respondent from Bamburi Cement Company argues that there are some suppliers/service providers with whom they enter into short term spot relationships only when there is a need and it ends after the service. This is because most often it is the nature and length of requirements that determine the length of the relationship.

## 4.7 Performance measurements of providers

Performance measurement for 3PL providers is believed to be useful for monitoring and evaluation which facilitates performance improvement, corrective actions during the contract terms, decisions on contract extensions and provider capacity development. Various measures are therefore in place to measure the performance of 3PL service

providers in the cement industry; these vary depending on the client company´s policy and expectation from their 3PL providers. However, these measures are explicitly revealed to the 3PLs at the onset of relationship and adopted in contracts as Key performance Indictors.

For instance, in Mbeya cement they have several performance measurements but in recent days the parent company´s policy gives more weight and emphasizes safety issues. This is done by assessing for example the distance covered by drivers without accidents and number of fatalities in a period.

Other common measures in this industry include the Quantity hauled in a month which measure efficiency and speed of the service provider, on time deliveries, state (quality) of the delivered/distributed cement and adherence to road safety rules as enforced by the governments. All the performance criteria at Bamburi cement are stipulated in the contracts that they enter with logistics providers.

### *4.7.1 Problems in collaboration*

As customary, hitches can always be found in every positive undertaking or initiative. This is illustrated by the problems encountered by Portland cement manufacturers in the process to establishing collaborative relationship with 3PL providers. For example, in the solicitation process, some transporters tend to misrepresent their capabilities/ capacity (A) which may cause loss to the client company. They do this by concealing material facts or weaknesses in their bids and exaggerating some capabilities that later or sooner becomes problems to the client.

Some 3PL providers breach contracts during its execution; they do this by e.g. lowering service level to the current client while serving other new customers. They manage this simply because the current client is already locked in and cannot switch to other providers in a short term.

Similarly, service providers including transporters tend to re-negotiate service/contract terms whenever fuel prices or other details change. In many cases the suggested percentage increment in transport fee is much higher than the actual increase in fuel price.

On the 3PL capacity, it is argued that transport sector in East Africa is in its infancy stage. Most service providers use second hand trucks which suffers frequent break down and

ultimately leading to poor service at an increased cost. Furthermore, most top management in the logistic providers´ companies lack necessary logistic management skills and therefore contributing to most of the problems.

For Bamburi cement there are no major or significant challenges, just little resolvable problems. However, fairly volatile fuel prices that call for many price changes over the contract period have been a thorn in the industry´s distribution cost structure. According to a respondent from Tanga cement, transporters in this part of the world want to make huge profits and they seem to talk to each other.

Mbeya cement also support this calling it a challenge in ensuring that price changes by 3PL are realistic. "We use a spreadsheet with formula that track transport cost. When our service providers propose an increase in service fee on the ground of fuel price escalation, we use this tool to ensure the changes in transport costs are realistic".

### *4.7.2 Success in collaboration with 3PL providers:*

As success in the managers in the cement industries credit the ability to solve problems together for the benefits of both parties as one of the main benefit of collaborative relationship in 3PL outsourcing. They identify being in long term relationship with their 3PL providers as a very important source of insights on how to achieve continuous improvement of logistics performance and the relationship itself.

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## 4.8 Logistics performance

These sections provide a general picture on how the logistic performance of the cement companies is impacted by the use of 3PL. In spite of challenges in deciding service costs and fuel prices most companies believe that use of 3PL has benefited their cost structure. Being not a core activity for the companies, investing in logistical assets could add up their fixed costs and operational costs through repairs of trucks, and fuel. "If we do cost/benefit analysis, we are having more benefits as logistics performance is more efficient and effective" Bamburi Cement.

In general the industries appreciate contribution of 3PL in decreasing the general distribution costs. The interviewees also agree on the fact that lead times in the industry

have been significantly reduced eliminating the chances that the cement quality will be compromised on the way.

The flexibility in operation is one of the biggest advantages of using 3PL. Using large 3PL networks without fearing running empty trucks on their return trips has increased customer services and more customers can be reached than ever. PL makes it possible for large and small companies to equally access markets even in remote countries.

Yet companies have mixed opinions about the performance of logistic function as a result of using 3PL; some feel "It is always a cut throat competition" (Bamburi Cement). "We engage some of the best transport service providers. We however are living in a third world set ups while trying to adopt first world standards of doing business" (Tanga Cement). These mainly refer to mismatch of expectation and what the companies´ executives actually experience in the 3PL, market.

### 4.9 Future of 3PL

The stakeholders in the cement industry believe that there is still a bright future for 3PL outsourcing in East Africa. They believe that there is a greater growth potential in this area; globalization makes 3PL an inevitable direction in East Africa. There is therefore a high probability that use of 3PLs will continue to the next level.

Outsourcing provides flexibility where manufacturers and suppliers of cement can easily scale up production and distribution network as well as divest them when demand shifts. With each company increasing production capacity to meet the demand, investment in logistics assets is unlikely as these may reduce flexibility to re-organize when need to be. Thus, outsourcing promises a better way of reaching far markets and satisfies demand with the new capacity without unnecessary investment in trucks and other logistics assets.

# Chapter Five: Conclusion and Recommendations

This chapter is intended to provide a summary of our findings in chapter four and again, set a stage for further studies and again develop few recommendations for the Portland cement industry. This entire project was intended to answer our four main research questions, various other issues were expounded and these helped to increase our understanding of how 3PL outsourcing is practiced in the cement industry in East Africa. As a conclusion, this chapter will be in line with each of the question providing a summary of the finding derived from this work. Therefore, we will organize this chapter in four main sections: first section being on rationale for 3PL outsourcing, second section in on outsourcing strategies in the industry, the fourth is on solicitation of 3PL providers with relevant capabilities and the last is on the logistic performance of outsourcing firms.

## 5.1 Rationale for 3PL outsourcing

Third party logistics (3PL) outsourcing in East Africa is not yet to reach the advanced and organized stages like in other regions. However, companies including cement manufacturers and suppliers outsource some of their logistics activities and through this study it was found that the outsourcing firms have already started to see the benefits.

Four main factors were mentioned as the rationale for outsourcing logistics services to 3PL providers. Like in many other studies, cutting down costs was cited as the most important reason for 3PL outsourcing followed by operational flexibility which entails, among other things,

Other justifications mentioned by respondents are saving management time that they can focus in core activities and spreading logistics/supply chain risks.

## 5.2 Outsourcing strategy

Supply Chain and logistics is big function in the cement industry and because of intense competition in the market and the bulk nature of cement, it provide a unique opportunity to increase operational efficiency. Besides Portland cement itself which is the final product, diverse other materials and outputs would daily go through the industry supply chain as inputs and parts.

One of important decision to make in outsourcing is to decide which activities to outsource and which ones to maintain in-house. The choice of activities to outsource depends on the company´s history and whether or not the company already owns its logistics assets.

In general, production, freight forwarding, customs clearance and Procurement activities are the commonly in-house activities in this industry. While warehousing is done both in house and outsourced to external 3PL providers, Transportation remains the most outsourced function in the cement industry. Most companies estimate that more than 60% of their logistic budget is outsourced to external providers.

Cement companies use different distribution models to reach their respective markets. These vary depending on whether or a company uses a 3PL, whether or not there are distribution depots and number of distribution depots. These models are summarized as:

- Indirect to consumer with a central in-house depot
- Indirect to Consumer through in-house regional/ zonal Depots
- Indirect distribution to consumers via independent distributors (3rd part channel – transport and warehouses; and
- Direct – from plant to customers – especially for bulk cement to industrial customers

### 5.3 Identification and evaluation of 3PL providers with relevant capabilities

In identification of the logistic providers with the necessary capabilities, most companies use the regular procurement procedures and policy. Information on 3PL providers is obtained through the request for information (RFI) and Request for Quotation (RFQ). Upon receiving this information the client company will evaluate the most responsive applicants using Analytical Hierarchy Process (AHP) which is mainly used for analyzing and selecting long term partners in this industry. This is based on spreadsheet and it defines the objective to be achieve, the key criteria, and available option or choices.

### 5.4 Collaboration with 3PL service providers

Collaboration with 3PL providers is a very powerful strategy to achieve effective outcome of outsourcing option. This is because of the opportunities to learn from each other and the possibility to run the contract in a win-win situation. To achieve and maintain a

collaborative relation with their 3PL providers, manufacturers mention few strategies that are used in the industry in East Africa. These include the use of the following:

- Elaborate contracts
- *Provider development*
- *Joint review meetings*
- *Long term contracts*

Furthermore, to ensure that the goal of outsourcing is reached, various performance measurements are developed and then integrated in the agreements as key performance indicators (KPI). These include the distance covered by drivers without accidents, number of fatalities in a period and Quantity of cement hauled in a month.

The relationships also experience some difficulties sometimes but respondents consider these are solvable problems. Some of the pointed out challenges include:

- Misrepresentation of actual 3PL capabilities
- lowering service level to the current client while serving other new customers
- Renegotiation of contracts e.g. when fuel prices increase.

On the impact of 3PL on logistic performances, the industry in general appreciates contribution of 3PL in decreasing the general distribution cost and increased flexibility in logistics. Being in its inception stage, 3PL outsourcing till face lot of challenges in East Africa. However, cement companies still have strong faith in its future success in the region because of the experienced and other potential benefits.

# References


Federal Highway Administration. (2011, April 7). *Portland Cement*. Retrieved May 31, 2011, from Infrastructure: http://www.fhwa.dot.gov/infrastructure/materialsgrp/cement.html

Abdullah, H. H., Mohamed, Z. A., Othman, R., & Uli, J. (2009). The effect of Sourcing Strategies on the Relationship Between Competitive Strategy and Firm Performance. *International Review of Business Research Papers , 5* (3), 346-362.

Admin. (2009). *Grey Portland cement The most Common in Concrete*. Retrieved April 2011, from Today´s Concrete Technology: http://www.todaysconcretetechnology.com/grey-portland-cement-the-most-common-in-concrete.html

Bashir, M., Afzal, M. T., & Azeem, M. (2008). Reliability and Validity of Qualitative and Operational Research Paradigm. *Pakistan Journal of Statistics and Operation Research , 4* (1), 35-45.

Boyson, S., Corsi, T., Dresner, M., & Rabinovich, E. (1999). Managing efective third party logistics relationships: What does it take? *Journal of Business Logistics , 20* (1), 73-100.

Buyukozkan, G., Feyzioglu, O., & Ersoy, M. S. (2009). Evaluation of 4PL Operating Models: A decision Making Approach Based on 2-additive Choquet integral. *International Journal of Production Economics , 121*, pp. 112-20.

Chen, H., Tian, Y., Ellinger, A. E., & Daugherty, P. J. (2010). Managing Logistics Outsourcing Relationships: An Empirical Invenstigation in China. *Journal of Business Logistics , 31* (2), 279 - 299.

Creswell, J. W., & Milner, D. L. (2000). Determining validity in qualitative inquiry. *Theory Into Practice , 39* (3), 124-131.

Fernie, J. (1999). Outsoursinbg distribution in UK retailing. *Journal of Business Logistics , 20* (2), 83-95.

Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report , 8* (4), 597-607.

Golic, S. L., & Mentzer, J. T. (2006). Empirical examination of relationship magnitude. *Journal of Business Logistics , 27* (1), 81-108.

Hofer, A. R., Knemeyer, A. M., & Dresner, M. E. (2009). Antecedents and dimensions of customer partnering behaviour in logistics outsourcing relationships. *Journal f Business Logistics , 30* (2), 141-59.

Jharkhariaa, S., & Shankarb, R. (2007). Selection of logistics service provider: An analytic network process (ANP) approach. *International Journal of Management Science , 35*, 274 - 289.

Knemeyer, M. A., & Murphy, P. R. (2005). Exploring The Potential Impact of Relationship Characteristics and customer Attributes on the Outcomes of Third-Party Logistics Arrangements. *Transportation Journal , 44* (1), 5-19.

La Londe, B. J., & Cooper, M. C. (1989). *Customer service: A management perspective.* The Council of Logistic Management, Oak Brook, IL.

Laarhoven, P. V., Berglund, M., & Peters, M. (2000). Third-party logistics in Europe – five years later. *International Journal of Physical Distribution & Logistics Management , 30* (5), 425 - 442.

Lieb, R. C., & Lieb, K. J. (2010). The The North American Third-Party Logistics Industry in 2008- The Provider CEO Perspective. *Transportation Journal , 49-65* (2), 53.

Lieb, R. (2008). The North American Third-Party Logistics Industry in 2007: The Provider CEO perspective. *Transportation Journal , 47* (2), 39-53.

Lieb, R., & Butner, K. (2007). The North American Third-Party Logistics Industry in 2006: The Provider CEO perspective. *Transportation Journal , 46* (3), 40-52.

McMullan, A. (1996). Supply chain management practices in Asia Pacific today. *International Journal of Physical Distribution & Logistics Management , 26* (10), 79-95.

Mello, J. E., Stank, T. P., & Esper, T. L. (2008). A model of Logistics Outsourcing Strategy. *Transportation Journal , 47* (4), 5-25.

Millen, R., Sohal, A., Dapiran, P., Lieb, R., & Van Wassenhove, L. N. (1997). Benchmarking Australian firms' usage of contract logistics services: a comparison with

American and Western European practices. *Benchmarking for Quality Management & Technology , 4* (1), 34-46.

Murphy, P., & Poist, R. (2000). Third Party Logistics: Some user versus provider perspectives. *Journal of Business Logistics , 21* (1), 121-34.

Murphy, P., Dalenburg, D., & Daley, J. (1991). Analyzing International Water Transportation: Perspective of Large US Industrial Corporations. *Journal of Business Logistics , 12* (1), 169-90.

Mwangi, F. (2011, January). Prospects for East Africa's Cement Industry. *ABNDigital*. Nairobi.

Omondi, G. (2011, May 14). *Corporate News - East Africa seeks higher tariffs for cement imports*. (Nation Media Group) Retrieved May 29, 2011, from Business Daily: http://www.businessdailyafrica.com/Company%20Industry/East%20Africa%20seeks%20higher%20tariffs%20for%20cement%20imports/-/539550/917876/-/vvjra4z/-/index.html

Omondi, G. (2010, May 14). *East Africa seeks higher tariffs for cement imports*. (Nation Media Group) Retrieved April 18, 2011, from Business Daily: http://www.businessdailyafrica.com/Company%20Industry/East%20Africa%20seeks%20higher%20tariffs%20for%20cement%20imports/-/539550/917876/-/vvjra4z/-/index.html

Patton, M. Q. (2001). *Qualitative evaluation and research methods* (3rd ed. ed.). London, United States: Sage Publications Inc.

Paul, M. R., Knemeyer, M. A., & Thomas, C. M. (2003). Logistics Outsourcing Relationships: Customer Perspectives. *Journal of Business Logistics , 24* (1), 77-109.

Portland Cement Association. (2009). *Cement Industry*. Retrieved April 16, 2011, from Cement & Concrete Basics: http://www.cement.org/basics/cementindustry.asp

Power, D., Bhakoo, V., & Sharafali, M. (2007). Adding Value Through Outsourcing: Contribution of 3PL services to Customer Performance. *Management Research News , 30* (3), pp. 228 -235.

Rao, K., & Young, R. R. (1994). Global Supply Chains: Factors influencing outsourcing of logistics functions. *International Journal of Physical Distribution & Logistics Management , 24* (6), 11-19.

Sink, H. L., & Langley, C. J. (1997). A managerial framework for the acquisition of third-party logistics services. *Journal of Business Logistics , 18* (2).

Soy, S. K. (1997). *The case study as a research method.* Retrieved April 2011, from University of Texas at Austin: http://www.ischool.utexas.edu/~ssoy/usesusers/l391d1b.htm

Tanga cement. (2010). *Corporate profile*. Retrieved May 2011, from Tanga Cement: http://www.simbacement.co.tz/Corporate-Profile.html

Walton, C. (2010). 4PL Versus 3PL. *Motor Transport* , pp. 10-11.

Westerberg, E. (2010). *Managing Director's Report 2010*. Retrieved May 31, 2011, from Tanga Cement: http://www.simbacement.co.tz/Managing-Directors-Report.html

Wilding, R., & Juriado, R. (2004). Customer Perception on Logistic Outsourcing in The European Consumer Goods Industry. *International Journal of Physical Distribution and Logistics Management , 34* (8), 628-624.