

**A STUDY OF EMPTY CONTAINERS MANAGEMENT BY
LOGISTICS FIRMS IN MOMBASA.**

Rucha, Kingsford Muriithi

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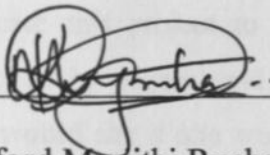
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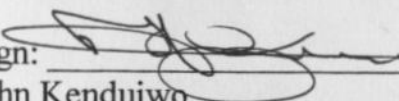
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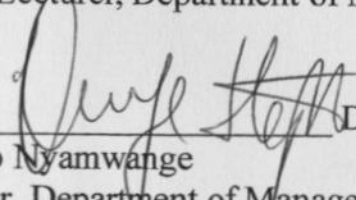
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Sign:  Date: 24/11/2007

Kingsford Muriithi Rucha
D61/P/7993/2004

This Project has been submitted for examination with my approval as a university supervisor

Sign:  Date: 26/11/07
John Kenduiwo
Senior Lecturer, Department of Management Science

Sign:  Date: 24/11/2007
Onserio Nyamwange
Lecturer, Department of Management Science

ACKNOWLEDGEMENT

DEDICATION

I dedicate this project to my late Mother Rosemary Kanini Rucha who although surrounded by poverty and lack struggled so hard to see me through education. How happy would she if she would have survived to witness the culmination of her many years of struggle.

I also dedicate this project to my dear wife Julie Whonge Muriithi our daughter Rozie Kangai Muriithi, my niece Tina and Delina my sister in law.

ABSTRACT

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I would like to appreciate the supervisors of this project paper; Mr. Nyamwange Steve and Kenduiwo John for their unwavering guidance, support and encouragement to see me realize this management research paper. My family also played a major role in this great achievement; particularly my wife who most of the times went out of her way to assist in typing, document organisation and moral support.

I would also like to appreciate the University of Nairobi for giving me an opportunity to pursue my Masters degree in the institution. Further, I would like to recognise and appreciate the assistance accorded to me by the respondents who although faced with busy schedules were able to allocate time to grant interview opportunities to and sacrifice their valuable time to fill the questionnaires. To all of you, GOD BLESS YOU.

ABSTRACT

The study had two major objectives. The first objective sought to investigate the current empty container logistics management practices by logistics firms in Mombasa. The second objective was geared to investigate and determine the challenges facing empty container logistics firms in Mombasa. Data was gathered mainly through semi-structured questionnaires and interviews. Content analysis as a method of data analysis was widely used in the analysis of the data collected. Charts and Tables were also used in the presentation and analysis of the data.

The findings of this study have brought out pertinent issues. Through the analysis of the data collected it was noted that there is a short fall in practices by logistics firms logistics firms in Mombasa compared to practices found else where in the world and therefore the potential for improvements largely untapped. It was also found that the customers always bear the bulk of the costs, even those associated with the logistics firm's inefficiencies.

Several challenges and remedies were identified. The empty containers turnaround time was identified as a key impediment because of poor infrastructural and poor management and workmanship. Management of empty container fleet was cited as a big challenge in many empty container logistics firms by many of the respondents. Other challenges identified include poor handling equipment, Shortage of storage within the port and at the empty container logistics centers, Long distance between the port and container depots, High tariffs and fees charged on empty container storage, Lack of a standardized tracking and security systems, Poor container stacking procedures at the port among others.

The findings and the recommendations of this study will be of great use to the empty containers logistics players and the policy makers in the future development and enhancement of the logistics sector in Mombasa. The experiences can also be used in other regions.

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KPA:	Kenya Ports Authority
NVOC:	Non-Vessel Operating Common Carriers
ODRD:	Off-Dock Empty Return Depots
PL:	Pick-Ups
SCAG:	Southern California Association of Governments
TED:	Twenty-Foot Equivalent Units
UK:	United Kingdom
UNCTAD:	United Nations Conference on Trade and Development
VCY:	Virtual Container Yard
VTD:	Vessel Miles Traveled

LIST OF ABBREVIATIONS

CCL:	Cargo Container Limited	
CY:	Container Yard	
DOC:	Drop Off Charges	
EDI:	Electronic Data Interchange	3
EIR:	Equipment Interchange Report	4
EOCL:	Empty Ocean Containers Logistics	10
GNP:	Gross National Product	16
KPA:	Kenya Ports Authority	18
NVOCC:	Non-Vessel Operating Common Carriers	18
ODERP:	Off-Dock Empty Return Depots	22
P/U:	Pick-Ups	32
SCAG:	Southern California Association of Governments	33
TEU:	Twenty-Foot-Equivalent Units	39
UK:	United Kingdom	40
UNCTAD:	United Nations Conference on Trade and Development	42
VCY:	Virtual Container Yard	43
VMT:	Vehicle Miles Traveled	55

CHAPTER ONE: INTRODUCTION

1.1 Background

Boyer and Mohades (2002) describe container logistics as a process of dealing with the movement and distribution of empty containers which as a segment of the whole container logistics cycle, is a critical part of a container's movement, commencing at the point where a container is positioned for reworking. Moving

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CHAPTER ONE: INTRODUCTION

1.1 Background

Meyer and Mohaddes (2002) describes container logistics as a process of dealing with the movement and distribution of empty containers which as a segment of the whole container logistics cycle, commence where a container is emptied, such as at a consignee's warehouse, concluding at the point where a container is positioned for reloading. Moving these empty containers efficiently—practically and economically—is a goal of all parties involved in the container business. This is especially true for ocean carriers who are often the owner (or supplier) of most of the containers used in their operations. Le Dam (2003) study found that most often ocean carrier's bear the cost of repositioning empty containers involved in the international segment, while local movement costs accrue to the customer's account.

Dynamar (2005) highlighted studies done by Shipping and World Trade (2005) and UNCTAD Review of Maritime Transport (2004) that found that, over the last four decades the total seaborne trade estimates have nearly quadrupled, from less than 6,000 billion ton-miles in 1965 to over 25,000 billion ton-miles in 2003. This study found that the global container population was approaching 16 million and 18.8 million TEUs (Twenty-Foot-Equivalent units) in 2001 and 2004 respectively and expected to be 21 million by 2005 and 23.2 million in 2006. The study further asserts that the global container moves exceeded the 236 million TEUs. This inventory has been substantially augmented by the massive number of containers built in the subsequent years as a result of the tremendous trade increase in the East – West routes.

Dynamar (2005) highlights that research carried out by Carrier Focus Group in 2001 estimated that almost \$110 billion per year is spent to manage shipments globally. Of this total, about 15% (\$16.8 billion) is believed to be associated with inefficiencies in container operations, including repositioning empty equipment. Dynamar (2005) argues that in 2003 the percentage of empty movements was relatively stable but the estimated cost escalated to more than \$11 billion, not counting overland repositioning and costs of

idle containers at depots. Further the study found that 8.7 million loaded containers were imported into the US and just 6.4 million of them were exported. This indicated that some millions of empty boxes stayed back in the yards and depots around the country, waiting to be repatriated. Since 1998 the problem has worsened.

Dynamar (2005) further states that the constant increase in the container population has been adding a few million empty containers every year in the U.S. In the past year the total US containerized import grew by 13.2% as compared to the 8.4% increase in exports. This led to an all time high container flow imbalance, which is estimated to reach the amount of 7.7 million TEUs. Theoretically, eighteen 8,200 TEU ships per week are required to evacuate such a volume, which underlines how major a headache this must be for involved carriers. As a consequence of the trade deficit and since over the past several years it has been cheaper for freight companies to buy new containers overseas than to ship empties back from the US to be reloaded, empty containers have accumulated in the regions around major ports. This problem is more serious in the developing countries because of the existence of trade imbalances.

Le Dam (2003) and Dynamar (2005) argues that as shipping lines struggled to overcome the equipment shortage began repositioning empty containers from areas with surplus, such as the U.S. and Europe, to areas with shortage, primarily in Asia, spending about \$1,000 for each container. Nevertheless, currently, it is reported that intensive manufacturing of containers in China, in combination with a slack in trade increase, has led to a surplus container stock in China of 700,000 TEUs. The forecast by these studies and others by other researchers that "current conditions will change, and another accumulation of empty containers will be witnessed" has already started materializing, in part due to the early 2004 hike in steel prices dropping precipitously.

Boile et al (2005) found that, in the eyes of port operators, shippers and carriers, the number of empty boxes sitting directly at the terminal should ideally be nil or very few. Given the fact that empty boxes have to go somewhere, storage and repair depots

represent an essential ingredient in containerization and as ports continue expanding and residential areas behind the ports have gobbled up more land for housing, storing empty containers has become an increasingly serious problem, requiring special attention.

Le Dam (2001) found that the expected growth in cargo throughput at port complexes over the next 5 to 20 years will cause pollution and congestion problems, along with the surface transport system's growing capacity shortfall worsening it. It is because of the problems and challenges forecasted by this study that call for identification and implementation of more efficient empty container logistics practices that could contribute to lessening of congestion and improve air quality and save high repositioning costs of empty containers.

Kenya Ports Authority (2006) shows that the empty container through-put at the port of Mombasa has been increasing steadily for imports exports and transshipments over the years, the total rising from 75,492 TEUs in 2002 to 153,344 TEUs by 2006. This means that empty container movements have increased over the years and thus birthing a new challenge of managing the se empty containers movement, repositioning and storage. This implies that there needs to be a greater and keen attention to improve and develop this ignored area of our economy yet critical to the country.

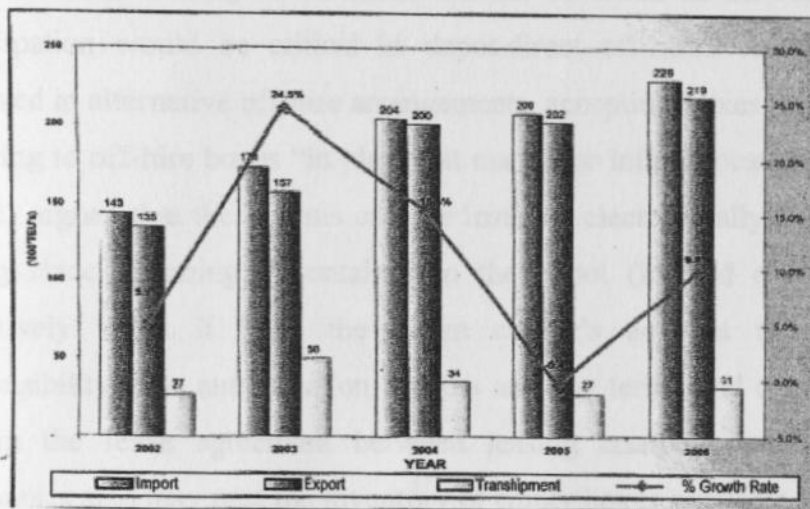
The table below demonstrates the container traffic through the port of Mombasa for five years, 2002-2006.

Table 1.1: Container Traffic 2002-2006

		(TEUs)				
	Status/Year	2002	2003	2004	2005	2006
IMPORTS	Full	127,424	159,379	189,911	193,223	217,869
	Empty	15,935	14,160	14,007	14,573	11,596
	Total	143,359	173,539	203,918	207,796	229,465
EXPORTS	Full	75,765	78,460	90,539	94,120	86,317
	Empty	58,935	78,749	109,895	107,467	132,237
	Total	134,700	157,209	200,434	201,587	218,554
TRANSHIPMENT	Full	26,746	43,778	29,336	22,318	21,825
	Empty	622	5,827	4,909	4,970	9,511
	Total	27,368	49,605	34,245	27,288	31,336
TOTAL	Full	229,935	281,617	309,786	309,661	326,011
	Empty	75,492	98,736	128,811	127,010	153,344
	Total	305,427	380,353	438,597	436,671	479,355

Source: Kenya Ports Authority; **Annual Review and Bulletin of Statistics, 2006: February 2007**

Figure 1.1: Container Traffic 2002-2006



Source: Kenya Ports Authority; *Annual Review and Bulletin of Statistics, 2006*: February 2007

1.2 Players in container logistics and the practices

A study by Meyer and Mohaddes (2002) identifies several players in the container logistics chain. These players include the ocean carriers who are ordinarily, the providers of both containers and chassis. They would provide electronic data on box specifications, any limitations on reuse, per diem rates and conditions, and return location instructions. Ocean carriers might also post the availability of empty containers at depots or other locations to facilitate reuse of these boxes before having them drayed to the harbor.

Since the trade imbalance generates large net numbers of empty containers (Meyer and Mohaddes, 2002) most truckers are usually used in trying to dispose off excess empties most economically. (This overall perspective will be confirmed in interviews and that will be conducted through this study). Truckers look for opportunities to interchange empties rather than hauling them back to the harbor, and for other opportunities to dispose of empties without incurring the long wait at terminal gates. Truckers with excess empties on hand usually post information on selected empties and initiate reuse and interchange procedures and they would dray excess empties to interchange them back to their own yard or to a neutral location for inspection and interchange.

Leasing companies are only involved when their containers are on-hired or off-hired. The leasing companies do not ordinarily do business directly with motor carriers, shippers, or intermediaries. Usually these firms are not involved in the reuse decisions, but their participation would be critical in depot-direct off-hires. Leasing companies may be involved in alternative off-hire arrangements, accepting boxes for depot-direct off-hire, or agreeing to off-hire boxes "in place" at marine or inland locations. Meyer and Mohaddes (2002) argues that these firms can for instance electronically authorize depot-direct off-hiring since returning a container to the depot (instead of to the marine terminal) effectively shifts it from the ocean carrier's account to the leasing company's responsibility. The authorization process and any terms and conditions would be spelled out in the lease agreement between leasing company and ocean carrier. Leasing companies also may post the inventory of empty boxes available for on-hire.

Marine terminal operators/stevedores, acting as the ocean carrier's representatives, may be involved in posting and updating information on on-terminal container status and empty disposition instructions.

The shipper is ordinarily the party who has loaded the container with goods. Depending on the financial arrangements, the goods in transit may belong to either the shipper or the consignee, and the party who actually owns the goods is called the "beneficial owner." A shipper could be a third party (e.g. forwarder or consolidator) who has consolidated multiple shipments or loaded the container on someone else's behalf.

The other group of players in the empty container logistics is what is known as 'third parties'. This is a nomenclature used to cover a broad array of potential participants who are neither carriers nor shippers/consignees. Third parties include Customs brokers, consolidators, ocean freight forwarders, transloaders, and non-vessel operating common carriers (NVOCCs). Third parties may load and unload containers and arrange for ocean, highway, or rail transportation. Meyer and Mohaddes (2002) highlights these players as container depot operators which are firms such as Logistical Container Centre which operate container depots where containers are stored and repaired. Container repair

services can be offered by marine terminal operators, container depot operators, or independent contractors in any location.

In the Kenyan context, empty container logistic players include: (a) The shippers who are the key players in the movement of containers across borders as described above. (b) The transporters or Drayage contractors who move the containers hinterland and are responsible for short haul movements of containers from ship-side to container terminals and customer locations. (c) Port operators which are organizations or authority operating internal and ocean ports/airports. In Kenya this mandate is undertaken by the Kenya Ports Authority (KPA). (d) Another player in the Logistics touching on the empty 'box' movements is the Freight Forwarders/Customs Brokers. When moving freight across international borders it is necessary to complete necessary documentation to comply with customs and other regulatory bodies.

1.3 Statement of the Problem

Current international logistics practices are a barrier to rationalizing the regional movement of empty containers (Meyer and Mohaddes, 2002) not only in Kenya but in the whole world. Such practices merely represent aspects of the structure of international trade and of market forces working to optimize overall system performance.

Meyer and Mohaddes (2002) argue that current empty container practices include Container Leased Contract which is part of a carrier's inventory management strategy. Carriers prefer to lease containers in a shortage area and off-hire them in surplus areas in order to avoid repositioning costs. Another practice is through the use of Container Liability. An Equipment Interchange Report (EIR) is used by industry participants to document the condition of containers at certain points and to establish responsibility for any ensuing container damages. This inspection is required at the point when a container is transferred from one party to another in the process of being transferred and routed for distribution. Terminal and depot gates are often the points used for inspecting the condition of containers whenever they are picked up or returned.

Hanh (2001) argues that, along with the broadly distributed benefits arising from the growth of containerized freight come a particularly focused set of problems and challenges for the transportation systems supporting the ports. The existing system for container transport to and from the ports relies principally on surface structures and vehicles (truck and rail trips) generated between these ports and off-site transport centers. According to this study, these freight trips contribute to vehicular congestion and air pollution in the vicinity of the ports and along key transportation corridors. In addition to complaints about safety and increased traffic congestion, this port-related traffic often engenders intense environmental opposition due to its contribution to air and noise pollution.

Le Dam (2003) points that given the expected growth in cargo throughput of the port complex over the next 5 to 20 years these pollution and congestion problems, along with the surface transport system's growing capacity shortfall, can only get worse: the identification and implementation of more efficient empty container logistics practices could contribute to a lessening of congestion and to improved air quality along principal freight corridors.

A keen evaluation of the Kenyan situation would show that the country is more of an importing nation than a net exporter. Since the current world trend as far as international trade flows is concerned is that most of the cargo is shipped in containers, empty container pile up and management problems is a big issue due to this imbalance. Another problem arises in the inland transportation since once the containerized cargo arrives at the port the truck or rail trucks would ferry cargo one way and return with the same box empty. Since Kenya mostly rely on imported fossil fuels to run her transportation system right from light transportation to rail transport, many container street turns not only deplete Kenyans of the so precious and scarce commodity but also its a waste of time and an economic injustice.

To the best of my knowledge, there are no studies or published studies on empty containers have been found, although they could be available but not documented. Also, it

is apparent that the best practices on empty container logistics are not fully in place in Kenya. Some practices like the use of Cargo Tracking systems have just started to settle in although the practice came in as a strategy to control the vehicle theft rather than to track containers.

This is why this is an area that requires attention by the scholars in the field of Physical Distribution & Logistics Management through research work. This study or analysis placed more emphasis on the Carrier and Trucking Companies perspective concerning empty container logistics, and accordingly assessed potential solutions from the carrier's and Trucking Company's point of view.

1.4 Objectives of the Study

The objectives of this research project were to:

- (a.) Investigate the current empty container logistics management practices by logistics firms in Mombasa.
- (b.) Investigate the challenges facing empty container logistics firms in Mombasa.

1.5 The Importance of the Study

The key objective of this study was to investigate the current practices of logistics firms in Kenya in regard to movement of empty containers.

This study will take a keen look at the ways the different players in the empty container logistics chain handle the ever increasing complexity of empty boxes. The study will seek to determine players practices such as leasing, transportation, damages and loss, role of each of the players among others. The findings of this study will be important to the following:

Industry: To inform on proper rationalization, current practices, areas where the industry can seek improvements and inform ways to increase performance and efficiency in handling of empty containers.

Management: The study will unfold the decision challenges facing empty container logistics and operations managers in their effort to achieve efficiency, management and repositioning of empty containers.

Policy Makers: The study is expected to create a deeper insight among policy makers who include the port management authority and the government what entails the empty container logistics and provide knowledge which can be used in future planning for facilities and infrastructure.

Academic: Once this project is complete, it will add to the body of knowledge already in existence by unfolding the empty container logistics practices and challenges facing logistics firms in Mombasa, country and region at large.

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview of the Logistics of Empty Containers

The term Logistics can be defined as “The process of planning, implementing and controlling the efficient flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of conforming to customer requirements” (Motari, 2002).

The institute of logistics & Transport (UK) (1993), defines logistics as “the time related positioning of resources” defining resources as raw materials, work in progress, management capability, finished goods inventory, physical assets, people and information, (Weller (2002)as referenced by Motari (2002)). Using this definition by Weller (2002), we can effectively be able to slot in empty container logistics management concept.

Chase et al (2001) defined logistics as a term that refers to the management functions that support the complete cycle of materials flows from the purchase and the internal control of work in progress to the purchasing, shipping and distribution of the finished products. Motari (2002) Le Dam (2003) argues that, for the international trade to be possible today, containers are required to enable this transition, yet these containers must be transported or shipped back empty to the locations where they are in high demand,

Le Dam (2003) describes empty container logistics deals with the movement and distribution of empty containers. As a segment of the whole container logistics cycle, empty container logistics commence where a container is emptied, such as at a consignee’s warehouse, and conclude at the point a container is positioned for reloading. Figure 3 shows diagrammatically one complete empty container movement cycle: from a consignee’s warehouse to the next cargo loading point (exporter’s warehouse). Once emptied, a container may be moved either directly to its next loading point, or to any of a number of intermediate locations. Possible intermediate stops include a carrier’s container yard, often located at marine terminal but also at inland depots; shipper (exporter)

warehouses; container leasing company depots; intermodal facilities including trans-load facilities; and trucking company depots or container rail yards. Each of these locations represents an alternative flow pattern in the movement of an empty container, and each currently necessitates a different logistics management approach.

Jaffray (1999) asserts that supply chain costs are significant and that these logistics costs in 1997 were an estimated \$862 billion in the US alone –global logistics costs estimated at \$3.4 trillion annually. Depending on industry sector, supply chain logistics costs account from 5% to 50% of a product's delivered cost. As such, supply chain management has been elevated in strategic importance, providing an area of potential strategic advantage for global players. A study performed by Pittiglio Rabin Todd & McGrath (PRTM) found that best-practice supply chain management companies had associated costs that were approximately 50% less than the median company within their industry.

Several country studies in East Europe (Murray 1993, Bloomen Et al 1994), Asia (Speece and Kawahara, 1995) and Africa (Dadzie, 1990) have identified numerous reasons for the poor state of logistics in the developing world. Weak logistics systems appear to be a common phenomenon in the East European countries. For example, the Hungarian logistics scene is characterized by outmoded production, distribution and supply systems, poor transportation infrastructure and inefficient third-party transportation. Uncertainty in demand and supply coupled with long manufacturing cycle times lead to excessive stock holding. Lack of warehousing facilities, poor information technology and inadequate cost data tend to aggravate the problems of decision making.

According to Murray (1993), these problems are due to management inertia and incremental but unimpressive improvements in logistics. In the former Soviet Union, poor transportation, political instability, national rivalries, bureaucracy, shortage of investment funds (Hastings, 1994), and ineffective organization structure (Rodnikov, 1994) are major obstacles to the development of logistics. In Poland, Rydzkowski et al (1994), major difficulties appear to revolve around the nation's adjustment to market economy, ownership and management of transportation enterprises.

Similarly, Handfield et al (1993) argues that the major impediments to the Bulgarian logistics system are traced to state ownership of production units, distribution system, warehouses and transportation companies. Lack of expertise and training for implementation of modern methods of logistics management has also been cited as a problem associated to logistics in Bulgaria. Using Ghana's example, Dadzie (1990), contends that logistics network configuration problems derive from the planners' short-term outlook that emphasizes overcoming immediate problems. For example, the problem of designing a transport network suitable for modern Ghana owes its origin to the sub-optimally designed and poorly maintained existing transport network and poor loading-unloading facilities of the Ghanaian ports.

The existing system emphasizes cost minimization for a narrow customer service objective that lacks long-term vision. Similar problems exist in Asia; in the People's Republic of China, the fault lies in inadequate transportation infrastructure, bureaucratic inefficiency and corruption (Speece & Kahawara, 1995). A comparative study of logistics management in Hungary, China, Korea, and Japan (Handfield & Withers, 1993) indicates that apart from issues pertaining to centrally planned economies, there is a lack of managerial skills in logistics, especially in Hungary and China. From the foregoing discussion, it is clear that problems of logistics systems and barriers to logistics development are unique to each country. The provision of links between productive facilities and consuming units, which is the fundamental role of logistics, is affected by differences in various country specific factors such as geographical features, socio-economic and politico-legal systems, cultural realities, industrial development and resource endowments.

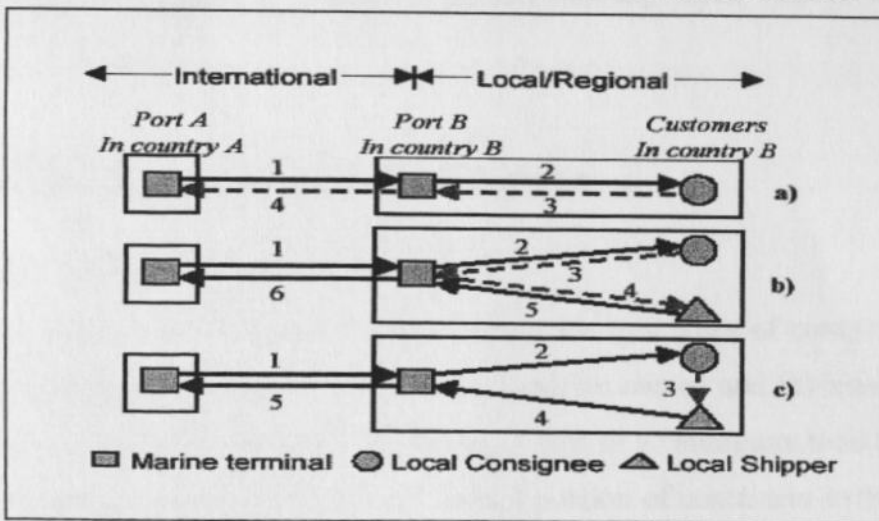
2.2 Movement Pattern of Empty Containers

In general, there are three possible movement patterns in one cycle of an international container move. In loaded import containers e.g. from Asia arrive at a port terminal (movement 1) under a detailed contract between the ocean carrier and the shipper (in this

case an importer). The shipment is picked up and delivered by truck to a consignee's warehouse (movement 2) for unloading. After the container is emptied, the empty container is trucked back to marine terminal (movement 3) from where it will be sent back to Asia (movement 4) for the next cycle.

This pattern of empty container movement involves both a local/regional segment (movement 3) and an international segment (movement 4). This movement pattern is often defined as the “repositioning” of empty containers. Similarly, the movement patterns shown in figure 4b and c are what carriers often call the “match-back” strategy—a strategy in which, instead of repositioning the import empty containers to Asia, carriers try to match local export cargo with available empty containers.

Figure 2.1: Possible Movement Patterns of an Ocean International Container



Source: Meyer and Mohaddes Associates, (2002), *Empty Ocean Container Logistics Study*

This type of match-back shipment is similar to the “empty container reuse” concept discussed by the Meyer and Mohaddes (2002). The differences between scenarios 4b and c are attributed to the inland movement of empty containers. In figure 4c, instead of an empty container returning directly to the marine terminal as shown in figure 4b, the empty container is drayed directly to an identified shipper (exporter) who needs the empty container for export cargo. The loaded container then trucked to marine terminal for shipment to Asia.

The movement in 4c is defined by carriers as “triangulation,” and as “street-turn” by the Meyer and Mohaddes (2002). This is the method of moving an empty container locally from a surplus location to a demand location without first returning to the marine terminal. This approach could be undertaken with or without an “interchange” of the empty container—the process of exchanging contractual liability for a container from one owner/operator to another. In other words, it is the transfer of a container from the responsibility of one party to the responsibility of another.

Strategically, the “match back” movement approach, shown in 4b and c, is most desirable from the ocean carrier’s point of view, as with this approach they can eliminate repositioning costs and, in most cases, generate additional revenue. However, from the local and regional perspectives, only the “triangulation” or “street turn” movement, that allows the direct reuse of an import container for a return export load, plays a significant part in reducing the number of empty trips, and thereby truck vehicle miles traveled (VMT).

2.3 Current Practices in Empty Container Logistics

2.3.1 Empty Container Ownership Structure

According to Meyer and Mohaddes (2002), there are two types of container ownership that currently exist in the market. These are (a) carrier owned and (b) leased containers. Compared to the early days of containerization, as part of a “minimum total cost” strategy, carriers are tending recently to reduce the owned portion of containers in their inventory, with a reciprocal increase in the proportion of leasing containers. However, for the most part, containers are still owned by carriers, with carriers in some cases continuing to own up to 80% of the containers in their operations. Container inventory management has been an important aspect of the container business. Maintaining a sufficient level of containers while minimizing inventory costs (capital as well as maintenance costs) is a challenge to each carrier’s day-by-day operation. Logistically, this challenge is even more challenging

when surplus and demand points for empty containers typically occur in different parts of the world.

2.3.2 Empty Container Leasing Contracts

Leasing containers is part of a carrier's inventory management strategy. Carriers prefer to lease containers in a shortage area and off-hire them in surplus areas in order to avoid repositioning costs. Under a leasing contract, the liability of leased containers is stated and transferred to the carrier under specific terms and conditions. Besides these legal agreements, to discourage carriers to off-hire containers at a place where the leasing company doesn't want to receive them (often at the surplus area), pick-up (P/U) and drop off charges (DOC) are applied together with a specific quota—a stated number of containers which any carrier can off-hire at a certain location per month.

It is typical that these quotas are small at places where leasing companies face a surplus in inventory. Pick-up charges (P/U) are applied when an on-hire container is leased at a place where inventory is tight. Similarly, drop-off charges are generally assessed when a container is off-hired at a place where inventory is in surplus. Thus, at the time of executing a lease contract, the charge for leasing a container (\$/day) is determined principally by the intended pick-up and drop-off locations, as constrained by quota conditions. From the time they take possession, carriers are responsible for all damage or destruction that may occur to those containers.

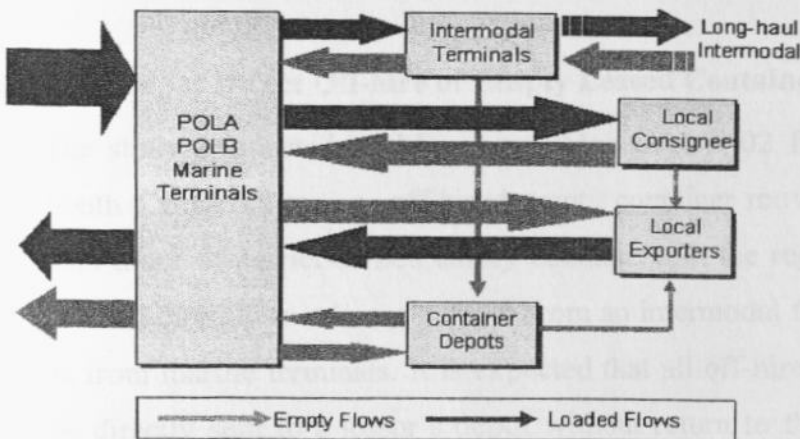
2.3.3 Liabilities of Parties involved Empty Container Logistics

Meyer and Mohaddes (2002) highlights that an Equipment Interchange Report (EIR) is used by industry participants to document the condition of containers at certain points and to establish responsibility for any ensuing container damages. This inspection is required at the point when a container is transferred from one party to another in the process of being transferred and routed for distribution. Further the study highlights that terminal and depot gates are often the points used for inspecting the condition of containers whenever they are picked up or returned. Often terminal and depot operators, on behalf of ocean

carriers, undertake the inspection and confirm container condition with the truck driver picking up or dropping off the container. Based on the EIR, payments will be made to ocean carriers (and thus to leasing company for leased containers) by the party responsible for any damage and loss. Through this study that was conducted in the United States of America, it was found that;

- About 716,000 empty container units (or 1.3 million TEU, with 1.85 TEU per unit) moved eastbound from the marine terminals to local or regional inland destinations via rail and truck.
- About 1.9 million empty container units (3.5 million TEU) moved westbound from inland intermodal points, from local consignee warehouses, and other smaller flows back to marine terminal.
- About 80,000 units (148,000 TEU) moved directly between inland locations (cross-town movement), which include local “depot-direct” off-hires of leasing containers, intermodal depot-direct off-hires, and empties reused for local exports.

Figure 2.2: Major Empty Container Flows in Southern California



Source: Meyer and Mohaddes Associates, (2002), **Empty Ocean Container Logistics Study**

Technically, Meyer and Mohaddes (2000) argues that the eastbound movements of 716,000 (about 1.3 million TEU) empty containers could be reduced if, out of the 1.9

million empty units moving westbound, 716,000 units could be utilized for local export directly without first returning to the marine terminal.

2.3.4 Returns of Empty Containers to Off-Dock Empty Return Depots (ODERP)

From the perspective of local and regional interests, the current practices calls for all empty import containers to be returned to marine terminals whether empty or loaded seems extravagant at best. However, carrier representatives that participated in the Meyer and Mohaddes (2002) relate that this practice is in place as part of the carrier's inventory management strategy and accords with current business circumstances. There are number of practical reasons for this practice.

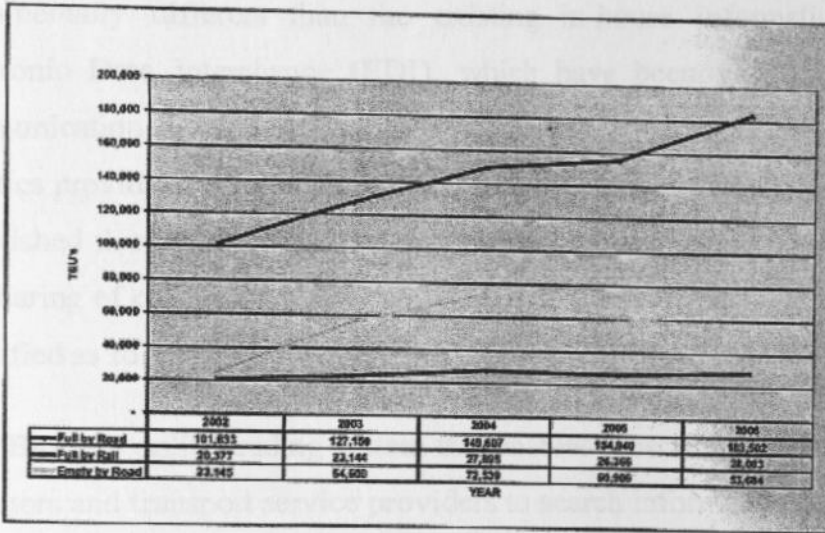
Due to the relative lack of local export cargo, most import containers are shipped back empty. Thus, it is better off for carriers to have these containers returned to marine terminals for their earliest possible repositioning to the area of relative shortage. For those empty containers that are reused for local exports, real time information on export shipments is often not available at the time they are emptied. Accordingly, logistical decisions for these containers would difficult to be made at this point of time. It is thus practical for carriers to have them returned to the terminal as well, Meyer and Mohaddes (2002).

2.3.5 Depot Direct Off-hire of Empty Leased Containers

The study conducted by Meyer and Mohaddes 2002 found that the current practice in South California region, off-hired empty container movements were often more flexible than those of carrier-owned empty containers. In the region, off-hired containers may be trucked directly to a lessor's depot from an intermodal facility or local consignee, as well as from marine terminals. It is expected that all off-hired containers in the region should be directly sent to a lessor's depot without return to the marine terminals. Logistically, depot direct off-hired containers seem to be a desirable solution to rationalizing the movements of leased containers which scheduled for off-hiring.

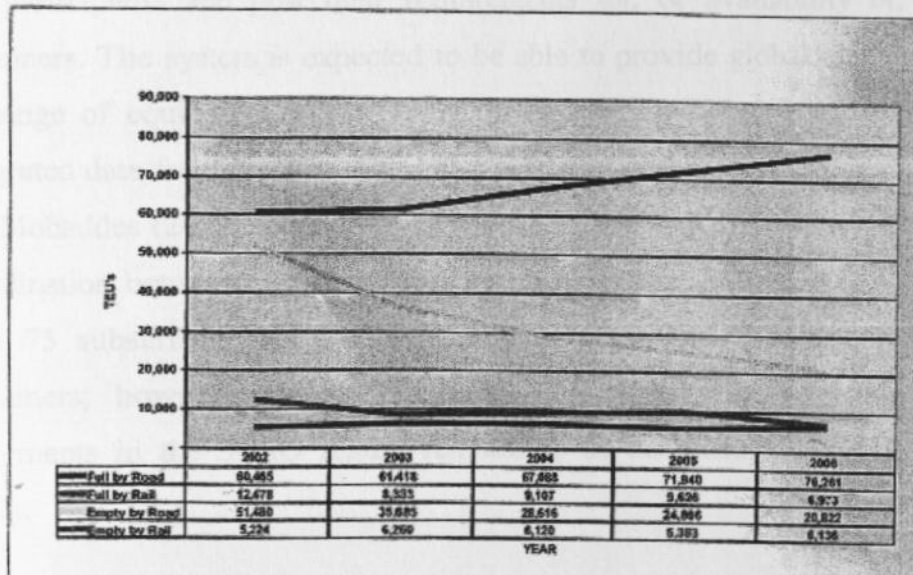
Off-hire activity is seasonal in nature. In the peak season of international trade, which often lasts from May to September, carriers tend not to off-hire in order to control their inventory level for the export market in Asia and to avoid higher charges for leased containers in this shortage area.

Figure 2.3: Deliveries at Mombasa Container Terminal 2002-2006



Source: Kenya Ports Authority; Annual Review and Bulletin of Statistics, 2006: February 2007

Figure 2.4: Receipts at Mombasa Container Terminal 2002-2006



Source: Kenya Ports Authority; Annual Review and Bulletin of Statistics, 2006: February 2007

2.3.6 Internet-Based Support Systems in Empty Container Logistics

Carriers as a major player would be interested in reducing the cost of moving empty containers. Most of the players have attempted to reduce costs by focusing on improving the means of matching export cargo with empty containers. Using the internet as a tool, these strategies require information regarding export cargo and available empty containers as a crucial element to facilitate potential matches. The practice is currently highly in place in U.S.A and Asian countries. These third-party strategies, or systems, are fundamentally different than the existing in-house information systems, known as Electronic Data Interchange (EDI), which have been widely established to facilitate communication between ocean carriers, marine terminal operators and their customers and logistics providers. According to Meyer and Mohaddes (2002), indicated that these newly established third-party systems, several of which are being developed, are predicated on the sharing of containers between different carriers. Through this study, these systems are identified as follows;

InterBox: An online trading system that enables subscribing container owners (carriers), operators and transport service providers to search information on the availability or need for containers posted by other subscribers to the service. Developed by International asset Systems Limited (IAS), the system functions as an online “notice board” where carriers and participants and post their requirements for, or availability of, vessel slots and containers. The system is expected to be able to provide global equipment visibility, the exchange of equipment (containers) and vessel slot capacity, and other services using integrated data from diverse carrier and vendor systems within the transport chain, Meyer and Mohaddes (2002). Similar to EDI systems, this system enhances communication and coordination between carriers and their customers along a transport chain. IAS claims to have 75 subscribers world-wide and a daily posting of information on over 2,000 containers; however, the usefulness of this system in reducing empty container movements in the SCAG region remains to be demonstrated. (Meyer and Mohaddes, 2002).

Meyer and Mohaddes (2002) puts other practices in regard to internet based support systems as follows; eModal, which is an on-line database management system designed to track and provide container information to terminals and truckers; **SynchroNet, which although** different from the systems mentioned above, is designed to assist only ocean carriers in exploring and cooperating opportunity for match up empty containers, interchange of equipment (container), and asset management. There are several specific service features provided by this system which include **SynchroBox** which provides real-time online information on the status of containers controlled by participating carriers; **SynchroSlot** which provides information on ship slot capacity which assists ocean carriers as well as customers to market and identify available empty slots on any particular shipping route and **SynchroSource** which almost similar to the and provides carriers the ability to explore available container capacity that meets specific origin and destination requirements.

2.3.7 Exchange of Empty Container through ‘Virtual Container Yard’

The possibilities presented by internet-based system have given rise to a new concept: the “virtual container yard.” This concept envisions a virtual exchange market as an alternative to actual container yards, a virtual place where container yard functions could take place without the necessity of moving containers to a physical container yard.

The current practice—the manner in which empty containers are distributed and re-located—has developed over the past few decades along with the growth of international trade and containerization, and as an integral part of a competitive market environment that has encouraged ocean carriers to search for all possible solutions to reduce such non-revenue generating activities as repositioning empty containers (Konings and Thijs, 2001). It is evident that carriers’ interests have given more strategic consideration to the logistics of forward-flow (loaded containers) than to the reverse movement of empty containers. Also, ocean carriers have thus far focused, with certain levels of success, their efforts on minimizing container repositioning costs in the ocean transit segment (e.g. utilize surplus ship slots for repositioning of empty containers), but with lesser thought applied to the inland transport segment.

This being the case Konings and Thijs (2001) argues that the question of why obvious local inefficiencies in the movement of empty containers are permitted to persist in a competitive international setting deserves consideration. In evaluating alternative regional solutions to the problem of empty container logistics, it is important to keep in mind that international logistics are optimized at a global scale, and that realizing optimization at a sub-system level could very well compromise the performance of the system as a whole.

As noted in the Meyer and Mohaddes (2002), “empty containers move back and forth because, at present, there is no alternative.” In positing possible future solutions, that study finds some promise in several nascent internet-based container information sharing ventures. The hope is that, given sufficient real-time information on the location and type of empty containers available, it would be more likely that the number of empty container trips in the region could be reduced through the use of more “street turns”—the direct reuse of import containers to local export loads.

According to this study, the potential usefulness of these information systems in enhancing the management of empty container movements is appealing; however, to make these systems a viable solution for rationalizing empty container movements, it is not the mere posting and sharing of information, but the timeliness and reliability of the information that matters. Additional conditions that pertain are discussed below in the sections dealing with the market circumstances of international trade. All of this suggests that there may be public policy options available that, through encouraging or discouraging certain behaviors, could modify the set of market choices and institutional arrangements that direct the present physical movements of empty containers. The first step in identifying good policy solutions is developing an understanding of the dynamics currently shaping the logistics of empty containers.

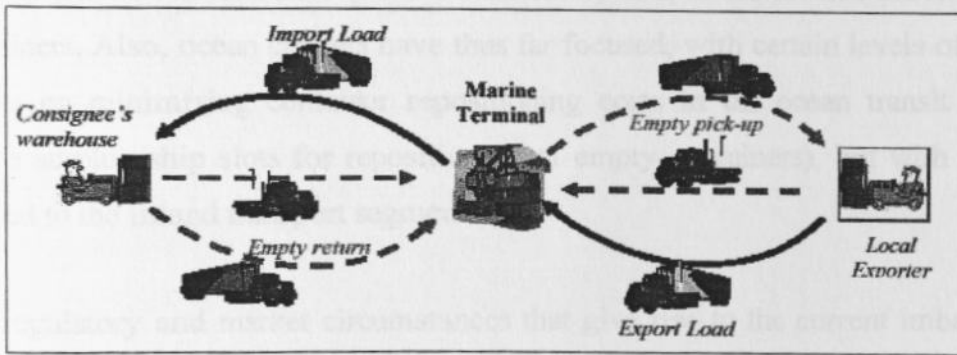
2.4 The Cycle of Handling Empty Containers through marine terminals

These empty container trips occur for various reasons, including conditions of business agreements between shippers/consignees and the ocean carriers (who are generally the

owner or supplier of shipping containers) that require all containers to be picked up and returned to container yards (CY) at the carrier's terminal, regardless of whether they are loaded or empty. Basically, for inbound and outbound cargo (as diagrammed in Figure 7), loaded containers are picked up by trucking companies from the carrier's terminal and are delivered to the consignee for unloading.

They are then returned to the carrier's terminal, usually by the same trucking company. The same practice is in place for outbound cargo. Trucking companies pick up empty containers required by an exporter from a carrier's terminal and deliver these empty containers to the exporter for loading. After a container has been loaded, a trucking company will transport the loaded container to the carrier's terminal where it will be stacked at the pier prior to loading on to a container ship. It is clear that, in the case of both export and import cargo; at least two-thirds of the required truck trips involve empty container movements, either for empty pickup or empty return.

Figure 2.5: Cycle of Container Handling



Source: Meyer and Mohaddes Associates, (2002), *Empty Ocean Container Logistics Study*

For port operators, empty container problems will also worsen as terminal land availability grows scarce. Empty containers are often allowed a longer dwell time at marine terminals (anywhere from 14 to 50 days), and the current practice of local terminal operators is to store containers, especially imports, on a wheeled chassis instead of in grounded stacks of containers, as is the common practice of terminals in Asia and Europe. These relatively land-inefficient container handling practices tend to restrict overall

terminal capacity. Additionally, the number of empty container movements at the terminals works to diminish the operating capacity of terminal gates. Drayage companies can experience an average of 2-hours waiting time at congested terminal gates. (Lloyd's Shipping Economist, 1998)

As the problems associated with the movement of empty containers become more apparent, the rationalization of empty container logistics will be of increasing strategic importance and come to be seen as valuable to all parties involved—from ocean carriers and shippers to intermodal (trucking) companies and local and regional governments.

Konings and Thijs (2001) describes the current practice—the manner in which empty containers are distributed and re-located—as having developed over the past few decades along with the growth of international trade and containerization, and as an integral part of a competitive market environment that has encouraged ocean carriers to search for all possible solutions to reduce such non-revenue generating activities as repositioning empty containers. It is evident that carriers' interests have given more strategic consideration to the logistics of forward-flow (loaded containers) than to the reverse movement of empty containers. Also, ocean carriers have thus far focused, with certain levels of success, their efforts on minimizing container repositioning costs in the ocean transit segment (e.g. utilize surplus ship slots for repositioning of empty containers), but with lesser thought applied to the inland transport segment.

The regulatory and market circumstances that give rise to the current imbalance in trade and number of empty container movements are rather complex and, accordingly, are not likely to be resolved through a single or simple solution. Several previous studies, including the recent Meyer and Mohaddes (2002) study on EOCL, points out that “the major barriers to rationalizing empty container movements in the region are not technical or economic, but institutional,” and suggest that the greater burden for institutional change rests properly with the ocean carriers. Thus, from a particular perspective, it can be argued that the current practices related to empty containers seem somewhat irrational.

As a whole, however, these practices have arisen and perpetuated themselves in a highly competitive and international context wherein all parties, and especially ocean carriers, are cognizant of the inefficiencies inherent in the repositioning of empty containers and are motivated to achieve optimal performance. This being the case, the question of why obvious local inefficiencies in the movement of empty containers are permitted to persist in a competitive international setting deserves consideration. In evaluating alternative regional solutions to the problem of empty container logistics, it is important to keep in mind that international logistics are optimized at a global scale, and that realizing optimization at a sub-system level could very well compromise the performance of the system as a whole.

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2.5 The Impact of Efficiency and Innovation of the Ports to Containers Movements

In modern ports, efficiency is compromised by weak system-wide co-ordination. “The most striking feature of internal port organization is the considerable number of bodies that participate in the transfer of goods between ships and inland transport vehicles” (Jansson and Shneerson, 1982). There are both historical and political reasons for this fragmentation. As labour-saving steamships replaced sailing ships, shore-based labour replaced the ships’ crews for cargo handling, but usually supervised by a stevedore responsible directly to the foreign ship owner.

Stevedoring firms emerged, and rapidly gained considerable industrial power. Typically, stevedores responsible for stowage and un-stowage are separated from the labour used for further handling between quay and land transport, when as a rule, responsibility for the cargo is transferred from ship owner to warehouse owner.

The efficiency of port industries is important in the first place to port users, for whom ports services have always constituted a bottleneck in periods of rapid international trade. For example, at the height of the oil boom in Nigeria, the average waiting time for ships in the port of Lagos was 240 days (Jansson and Shneerson, 1982).

Le Dam (2002) study found that as the global economy continues emerging from the recession of the early 1990s, international trade and demands on logistic services are increasing and secondly, the efficiency effect of enhancing port throughput is important to the service providers and to the port hinterland. Also, in terms of total costs incurred, the provision of port services is the most significant link in the chain of seaborne goods transport, often exceeding the costs of shipping proper.

According to this study innovation in maritime and port logistics is as important as in any other part of the supply chain. Total port throughput is a function of the number of berths, capacity per berth and berth occupancy rate. Historically, ports have expanded berth numbers in order to increase capacity, and shipbuilders have built large vessels to achieve

economies of scale. In terms of handling, the stowage and unstowage of cargo was the bottleneck in port handling until the development of containerization and roll-on/roll-off shipping.

Innovation in port organisation in order to improve the efficiency of the international logistics chain is illustrated by the recent decision by the UK shipping line P&O to invest \$550 million to help ease congestion in the port system around Bombay. Bottlenecks have been created because the port system has not been able to keep pace with the expansion in trade since economic liberalisation began in the early 1990s. Current capacity is rated at 175 million tonnes, and Indian ports have been handling more than 200 million tonnes, a total predicted to rise to 350 million tonnes by the year 2006, (Financial Times, 1997a).

Another example of innovation is P&O's vertical strategy to overcome the historic fragmentation of the ports industry by establishing a joint venture with Associated British Ports to develop Southampton container terminals in the UK (Associated British Ports Holdings PLC, 1996).

2.6 The Port Logistics Chain In Regard To Containers Handling

Maritime shipping takes two forms – charter or tramp services, which are used mainly for irregular contract services for loose cargo; and container services by regular shipping lines. Modern ports are a complex of firms, a “port community”, which provide a range of logistics services related to both the goods and the ships.

Port Functions: The main function of the port is to transfer goods from land to shipping transport, and vice versa. The complete sea-land process can be divided into seven handling stages:

(a) Passage of the ship through the approach channel up to the quay refers to the process whereby the ship is guided through channel to the port all the way to the docking position from where the cargo is offloaded. (b) Discharge of the cargo from the ship's hold to the quay which is an operation which involves lifting of the cargo from the ‘cargo holdings’

of the ship to the land side. (c) Moving the cargo from the quay to transit storage is another service offered by the port which refers to the process where the cargo is moved from the quay side to waiting storage areas to await collection by transporters or consignees. (d) Transit storage of cargo is a temporal storage area for cargo waiting to be loaded back to the ships enroute to other destinations. Moving the cargo from transit to the loading platform is also a function of the port which involves movement of cargo from the transit storage areas to the loading area for outbound transportation.

Other services include loading the cargo on to land transport e.g. on rail wagons and departure of land transport from the port area. Firms involved in the throughput of cargo include ship brokers, ships' agents, shippers and forwarders, stevedores, transport operators and warehouse operators.

2.7 Port charges

Occupancy charges levied per unit of time for use of berths and storage facilities and port dues levied on ship tonnage or cargo tons. Stevedoring charges are usually charges associated with the handling of cargo from the ship and into the ship.

Other cargo handling charges (Jansson and Shneerson, 1982) in addition to the cargo handling stages, are the functions of in-port ship management and provisioning, agents' exchange functions and regulatory port functions such as customs and other inspections (Jansson and Shneerson, 1982). For agrifood products these include sanitary and phytosanitary controls.

Efficient management of the logistics chain, of which maritime ports constitute an important link, is self-evidently important to the clients who use the services. The prosperity of the port depends on the efficient flow of ships and goods through its docks. The performance of a port is also important to the hinterland, throughout which the economic benefits are multiplied. For example, direct employment in port activities in Rotterdam in 1989 amounted to 69,300 people, with 300,000 employed indirectly. In 1992, Antwerp contributed 3.3 per cent of Belgian GNP (Compés López, 1996).

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

The research design of this study was a case study. This is due to the exploratory nature of the study and lack of empirical evidence in this area of study in our region. Therefore a qualitative research design was used to study the industry practices. Kaplan and Maxwell (1994) argues that the logic of choosing qualitative research as opposed to quantitative is that the goal of understanding a phenomenon from the point of view of the participants and in particular social and institutional context is largely lost when textual data are quantified. According to Gachau (2003) qualitative designs are also particularly suited for research in an under explored field of study and when the aim of the study is not to test a previous study but to focus on understanding and explaining the practices and challenges as this study is seeking to do. According to Mbogo (2003), the advantages of using case studies include an in-depth understanding of the behaviour of the concerned unit and facilitating intensive study of the concerned unit.

3.2 Population and Sample

The population in this study was all the shipping companies (Ocean Carriers) and all the empty container logistics firms based in Mombasa. Mwakanongo (2007) states that currently there are nineteen (19) shipping firms registered in Kenya. These firms are listed in Appendix I and some others listed in the Official Yellow Pages Coast Edition (2007/8), most of these firms and others are listed under Ser/Shi and Shi/Soc section.

The sample for this study was ten (10) shipping firms which by extension are also empty container logistics firms. Based on this sampling, ten (10) firms amongst the ones listed in Appendix I, and those listed in Official Yellow Pages Coast Edition (2007/8), were used in this study. <http://en.wikipedia.org/wiki/containerization> (2007) lists most of these firms (some represented by agents or subsidiaries) as amongst the top ten container shipping companies in the world. Other studies including the ones done by LeDam (2001), Gachau (2003) and Mbogo (2003) used equally smaller samples in survey studies.

3.3 Data Collection

The primary data was collected through structured and unstructured interviews using the questionnaire and interview guidelines provided in Appendix II. The interviews involved the interviewer asking questions to one respondent (interviewee) in a face to face situation and where it was not possible the questionnaires were sent to the respondents. The interviewer role was to get in touch with the respondents and ask them predetermined questions and recording the answers obtained.

The questionnaires were divided into two sections. The first section which was a structured section was aimed at obtaining information on the company profile whereas the second section which included both closed and open ended questions (semi-structured) was to help the researcher to gather data about the empty container logistics management practices. This section was divided into six (6) subsections: Container Transportation; Container Leasing; Container Insurance, Damages & Repairs; Container Disposal; Container Tracking & security and Port Operations & Stacking.

LeDam (2001) argues that in a research involving institutional and market intelligence and competitive issues that are generally considered to be proprietary in nature, the best method to use is personal interviews since they are likely to provide the best means for gaining greater insight and a closer sense of the actual problems pertinent to objectives of research. On basis of this argument, this research project adopted this method of data collection.

3.4 Data Analysis

Being an exploratory study, several methods were used to analyze the data collected through the interviews. The responses received from the respondents were analyzed using descriptive statistics where necessary. Descriptive statistical methods such as percentages and frequencies were used although at a limited level. The data collected was represented using tables, charts and figures. Descriptive techniques are usually able to employ factual information about a situation to provide an understanding of performance levels (Ngau,

2004). Tables, charts and graphs were used to supplement statistical analysis as these are particularly appropriate for comparison of nominal data (Cooper and Schindler, 2003).

Since one of the key objectives of this project was to investigate the current logistics practices of empty containers related to the movement of international cargo through the port of Mombasa, data collected was analysed to establish the existing logistics systems for handling empty containers and institutional arrangements and practices that are presently in place.

Data collected was also analysed to determine key challenges facing this sector in the country today. According to other studies conducted in United States of American and Asian countries (Le Dam, 2001, 2002, 2003 and Meyer and Mohaddes, 2002) a more complete understanding of these issues was required if regional policy efforts intending to rationalize empty container movements are to achieve their stated purpose. This study was however different from these studies because of the regional differences, structural development inequalities and management approaches and practices in place in those areas where the studies were carried out.

Content analysis was the main analytical tool used in this study since most of the questions asked in the questionnaires were open ended. Njanja (2002) states that such questions are used because they give the respondents a wide room to express themselves and the researcher through the analysis of the responses gets an opportunity to probe thereby generating more information. Use of content analysis in the analysis of data in this study involved manual comparisons of various responses to determine the extent to which they compare, differ or contradict.

This study and the analysis of the results placed an emphasis on the carrier's and the empty container logistic firm's perspective concerning empty container movements, and accordingly assessed potential solutions from the two parties point of view.

CHAPTER FOUR: DATA ANALYSIS AND FINDINGS

4.1 Introduction

The response rate indicated that from the ten questionnaires sent out to ten specific firms, responses were received from seven companies which include:

1. Inchcape Shipping Lines
2. Delmas (K) Limited
3. Ocean Freight (E.A) Limited
4. PIL (K) Ltd
5. Diamond Shipping Services Ltd
6. Maersk Kenya Limited
7. GAC-Seaforth Shipping

Although in a study comprising of a fairly small sample, total response would be desired, 'seven out of ten' response rate is quite satisfactory. Out of the seven firms that participated in this research, four (4) filled the questionnaires and invited the researcher for an open interview whereas the remaining filled the questionnaires only. The table below displays this information.

Table 4.1: The list of logistics firms that responded

FIRM	Response Granted
Cargo Containers Limited	Questionnaire
Delmas (K) Limited	Questionnaire/Interview
GAC-Seaforth Shipping	Questionnaire
Inchcape Shipping Lines	Questionnaire/Interview
Maersk Kenya Limited	Questionnaire
Ocean Freight (E.A) Limited (MSC)	Questionnaire/Interview
PIL (K) Ltd	Questionnaire/Interview

Source: Research data

4.2 Firm's Information

The questionnaire was divided into two sections. The first section was used to capture the firm's information. The information captured under this section includes the company name, year of establishment, ownership structure and the type of business the firm engaged in. It was found that the ownership structure of the firms that responded to the questionnaires is mixed .i.e. some are locally owned, others internationally owned and still others owned both locally and internationally. The table below demonstrates the type of business the firms engages in and the ownership structure:

Table 4.2: logistics firms ownership structure and type of business

FIRM	Ownership	Business Type
Cargo Containers Limited	Local	Transportation/Container storage and Repair
Delmas (K) Limited	International	Ocean Carrier/Shipping agent
GAC-Seaforth Shipping	Local/International	Shipping agent/Port services
Inchcape Shipping Lines	Local/International	Ocean Carrier/Shipping agent
Maersk Kenya Limited	International	Ocean Carrier
Ocean Freight (E.A) Ltd (MSC)	international	Ocean Carrier/Shipping agent
PIL (K) Ltd	International	Ocean Carrier

Source: Research data

The second section was capturing both the empty containers practices and challenges. Most of the questions used in the second section were open ended and few were closed ended and comprised of six parts. These parts were:

1. Empty Container Transportation
2. Container Leasing
3. Empty Container Insurance, Damages and Repairs
4. Container Disposal
5. Container Tracking and Security
6. Port Operations and Stacking of Empty containers

This part of the analysis tries analysis the responses and feedbacks that were received in response to the questions under each of the above topics.

4.3 Empty Container Transportation

The firms were asked to indicate the number of trucks they owned and only one indicated that did own transportation chassis/trucks for moving empty containers. Further, these firms indicated that they do not engage in the commercial transportation business.

The firms were also asked to indicate the party involved in empty container picks and drops. All the respondents interviewed confirmed that all the parties may be involved but in the local scene the clearing and forwarding agents acting on behalf of the consignee is the key party. Further the respondents confirmed that although the consignees may use the agents, the responsibility in regard to picks and drop of empty containers to or from the port or logistics centers and at the port lies squarely on the consignee.

In response to the questions on the practices aimed at reducing the street turns of empty containers, several practices were identified, including designating of the pick/drop points for empty containers. Inchcape for instance confirmed that they require consignees/transporters with their containers to drop them at SDV Trans-Ami in Kampala; Express Depot in Nairobi or CCL, Hakika or Bridge depots in Mombasa. The managers also confirmed that the practice as per the contractual agreement is that the containers must be returned at the pick up point. If dropped somewhere else the party involved, in this case will do so at an extra fee. This they said was to reduce the repositioning costs since the container will be eventually transported empty if shipper requires it for reuse.

The reuse of empty containers for local export is considered to be a potential solution for rationalizing the movement of empty containers and thereby reducing unnecessary empty trips. From the interviews and discussions conducted with several Mombasa-based shipping lines like Delmas, Inchcape and PIL lines, the notion of increasing the reuse of empty import containers for local export cargo is nothing new. For many years carriers

have been implementing the reuse operation whenever there is an appropriate opportunity for reuse. The ideal situation for the reuse of empty containers is when the exporting customer is also an importer and the commodities imported and exported can be shipped in the same type of containers. The second best case would be where an exporter was geographically proximate to an importer and would be able to receive emptied import containers for loading with exports. It was highlighted by the respondents that carriers have found that these conditions allowing for the triangulation approach of reuse empty containers are more often found in developed countries and therefore in the developing countries like Kenya this practice is still a dream.

All the managers interviewed confirmed that one of the practices across shipping lines to reduce empty container drop delays is through penalties when the consignees fail to return the empties on time. The free allowable number of days for Mombasa, upcountry, Uganda, Rwanda and Congo varies from shipping line to another although largely comparable. For instance, PIL Lines allows 14 free days for Mombasa bound containers, 21 free days for Nairobi, 35 free days for Kampala and 45 free days for Congo bound containers. After these free allowable days elapse, the empties start attracting charges. For the next 14 days after the lapses, the container attracts \$6 per day and if not returned, within the next 14 days it attracts a charge of \$12 per day indefinitely.

The respondents cited several challenges in regard to empty container transportation. The cost of transporting empties is very high and it is equivalent to the cost of shipping laden containers. It was also noted by the respondents that containers require special designed trucks or chassis as well as rail wagons which are not only expensive to acquire but also costly to maintain. Frequent movements and multiple handling of containers were also cited as one of the key challenges since they expose containers to damages. Poor road infrastructure and traffic jams both within and outside the port and along the roads leading to the port were also identified as some of the factors hampering the free flow of empty containers.

4.4 Container Leasing

Several questions were asked on the practice of container leasing by the empty container logistics firms in Mombasa. The players highlighted that in most cases containers are stored, maintained, and interchanged at two principal locations: the marine terminal container yards (CYs), and the off-dock container depots. The marine terminal CYs are part of the port terminal complex and operated by the marine terminal operators on behalf of the ocean carriers. Container depots are usually owned and operated by separate, specialized firms. Existing off-dock container depots already handle large numbers of empty containers. These depots handle both carrier-owned containers and leasing company containers, and have the capability of accepting containers from one trucker and releasing them to another. Thus, the existing depot network already has some of the critical capabilities of the off-dock empty depots for solving empty container logistics problems.

Through these interviews, it was discovered that the practice where consignees can hire containers directly without going through the shipping lines first is not well developed in the local scene. If a consignee, for instance wants to ship their cargo through Delmas lines, the consignee will contact Delmas to allocate them containers owned by the shipping line. The consignee/transporter would then be advised to pick the container at a designated point or depot using the documents given by the shipping line after paying the charges applicable. The empty container would then be released through the interchange of documents.

The industry players identified three types of empty container leases as; Long-Term leases, Short-Term leases, Lease and purchase agreements and purchase agreements. The lease or hire charges vary from one firm to another but averages at between \$7 to \$8 for 20 feet containers and \$14 and \$16 for a 40 feet container. It was further determined that the cost of leasing empty containers depends mostly on hire duration, special features and

the number of containers hired respectively. When the boxes are finally returned at the drop off points they may attract such charges as Cleaning charges, drop off costs and repair charges in case the containers are damaged. The drops off costs arise when the containers are not returned back to the designated drop off point or area according to the agreement.

Some of the challenges identified in regard to empty container leasing include the inability of the shipping lines to match demand and supply for empty boxes for both inbound and outbound cargo. The players confirmed that the shipping lines are more often than not involved in competitive rivalry, such that even if one shipping line is experiencing inadequacy in empty container supply in the local market, they would sometimes ship in empties rather than use the competitor's containers.

4.5 Container Insurance, Damages and Repairs

The insurance and damages on the containers depends on the party responsible for the container at the time. For containers on inland transit the consignee together with the transporter are responsible although from the shipping line point of view, the consignee is fully responsible when any anomaly or problem occurs with the container. For instance, if a container is damaged or not returned the consignee solely held liable. It is the responsibility of the consignee when this happens to follow the transporter/clearing agent to pass the liability to them if there was an agreement between them.

For the containers in the ship during shipment the shipper is fully responsible for the container. At the depot, the depot firm is fully responsible for the containers under their custody. When a container is fatally damaged it is returned back to the logistic center. Some shipping lines confirmed that they usually appoint an independent surveyor to assess the damage at the site to determine the extent of damage and assess and recommend whether the container can be repaired or the replacement price should be charged. If the consignee agrees to meet the replacement value, they will retain the container otherwise they are required to return the damaged container at the depot and pay the repair charge altogether.

The challenges facing the empty container logistics firm in regard to empty container handling and management were identified as the container turn around time. The players highlighted that the number of days a container take between the time it is offloaded at the ship or picked from the depot to the time when it is again available for reuse for exportation is quite long in Kenya. This is due to the state of road infrastructure and rail services which do not permit efficient flow. Lack of enough equipment at the pick up and drop off points were also identified as a major factor leading to the delays in movement of empty containers which eventually increases the chances of damages raising the insurance premiums.

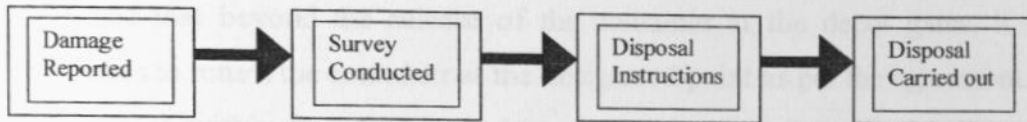
Lack of enough storage space at the container depots has resulted to placement of containers any how at the road reserve, estates, basically containers may be found placed anywhere within Mombasa island. The respondents noted that, this problem will not ease up since there is no land for the port expansion nor space to set up near or expand the existing depots. Empty container idle time is on the rise due to lack of exports to economically reposition containers elsewhere in the world where they are demanded. Container handling is an expensive venture that requires large capital investment at both ends of the logistics chain. Mombasa logistics industry is dominated by fairly small firms which mainly are unable to invest in modern efficient handling equipments. The greatest challenge is therefore on investment and this is not likely to change soon bearing in mind the growth of imports of containerized cargo.

4.6 Empty Container Disposal

Factors commonly considered when disposing containers include the age of the container. The life span of a container is between 12-15 years and when they reach this age they are considered unseaworthy or uncargoworthy. A few respondents confirmed that repositioning costs could also be remotely considered particularly when the empties require long distance transportation. Since each shipping line keeps records of their containers, once containers are due for disposal, specifications details on the containers

are submitted by the shipping line. Also a price opinion may be submitted during this time. Mostly during disposal there is no standard price although a physical assessment is carried out to determine the price by considering the extent of the damage and age. On the issue of disposal process the respondents agreed that that the disposal process may take four steps as shown below.

Figure 4.1: Empty Container Disposal Process



Management of empty container was cited as a big challenge in many empty container logistics firms by four of the seven respondents. Other challenges identified include; the turnaround for containers as earlier identified. An empty container generates no revenue when in storage or moving empty but rather it is a cost center at those instances. This is why the players would rather carry high volume cargo in the containers rather than move empty. When a container is in the storage yard it is subjected storage costs, handling costs and risk of damages resulting to repair costs.

4.7 Container Tracking and Security

Most container logistics firms use both manual and computer based information systems. Some of the systems identified are shown in the table below:

Table 4.3: Container Tracking & security by firms

FIRM	Type of System
Cargo Containers Limited	CTS-Container Tracking System
Delmas (K) Limited	Not Specified (Both)
GAC-Seaforth Shipping	Excel, Manual
Inchcape Shipping Lines	StarMet, EDI during shipping
Maersk Kenya Limited	Not Specified (Both), Internet
Ocean Freight (E.A) Limited (MSC)	Kensoft, Internet, Excel
PIL (K) Ltd	ASFS, Manual

Source: Research data

One of the amazing issue that was expressed by the Delmas shipping line Manager was that, there exist no ISO (International Standard Organisation) recognized system in the

world for tracking the container unlike other industries with even shorter history than shipping.

The respondent confirmed that the obligations of tracking containers is usually passed to the consignee through payment of container deposits before being allowed to use or access empty containers for use. Some of the shipping lines involved in this study confirmed that beyond the release of the container at the depot gates, it is upon the consignees to return the container at the designated point as per the agreement. When they fail to do so within the agreed number of days is when the shipping lines or shipping agents gets concerned and start following the consignee using the details provided in the documentation. Many of the respondents confirmed that the consignee is wholly responsible for tracking of the empty container because they stand to loose since they are the ones that signed the agreement of release of the container. Further, ocean carrier's main concern is getting the empties back on time for use in export business, for containerised exports would be impossible without containers.

Several measures directed towards tracking empty containers were identified. These measures include:

- Container deposits: Consignee is usually required to deposit money with the shipping lines before picking the container for use. This money is refunded once the container is dropped back at the designated logistics point.
- Demurrage charges: When the consignee leases or hires a container they are allowed a reasonably specific number of free days within which they should use and return the container at a designated depot. Beyond this duration the container will start accumulating demurrages. This is meant to indirectly force the consignees be responsible and take care of the boxes till they are returned. If damaged the consignee will meet repair costs.

- Inwards and outward interchange reports: This enables the shipping line and the depot companies monitor the movements (pick and drops) of the empty containers and effectively manage the demand and supply. Issuance of the guarantee forms and release letters by the shipping line enables the consignees allocation and pick ups of containers from the container depots or port.

Several challenges were identified as facing logistic firms in regard to tracking and security of empty container. These challenges include:

- Enormous changes in IT industry: This makes it necessary for logistic firms to keep abreast of the new software and technology trends.
- Lack of efficiency and poor workmanship by security firms who are to an extent responsible for general security at the depots. Corruption in the police force was also identified as a big blow to container security. This is because policemen are often compromised by the parties involved in the container thefts.
- Most of the times claims and court cases involving containers end up grounding containers for months which exposes them to threats of eventual loss or damage.
- Nature of yards and surrounding communities was also identified as a contributor to container insecurity. Since there is no computerized system to enable the shipping lines detect where their containers are automatically, manual tracking is both expensive and time consuming.
- In the developed world as identified in the literature review most of the advanced methods of empty container tracking are non-existent in the local environment.

4.8 Port Operations and Stacking of Empty Containers

This section comprised of five questions touching on the practices specific to the port of Mombasa as well as the challenges as far as empty container operations are concerned. The players involved in this study identified the obligations of the port as provision of container security and accessibility, provision of proper and efficient container handling equipments, notifying the shipping lines with all information regarding their empties at

the port and provision of temporary storage on short term basis for empty container, during and after offloading when need arises.

Kenya ports Authority discourages the stacking of the empties through high tariffs for both handling and storage. The storage charges per day for the containers at the port were identified as are as follows:-

Table 4.4: Container Handling Charges

Container size	Empty (\$)
20 feet	25
40 feet	25

Source: Research data

Table 4.5: Container Storage Charges

Container size	Empty (\$)	Laden (\$)
20 feet	20	25
40 feet	20	50

Source: Research data

The port allows two days free after which any container stacked at the port attract daily charges. Currently the port does not allow stacking of empties at the container logistics terminal. If they are being relocated they must be delivered as they are loaded without creating any buffer at the port. The demand and supply of the inbound containers is high where as the demand and supply of outbound containers is low and highly respectively.

The respondents in this study identified the following challenges in regard to empty containers handling and storage at the port of Mombasa:-

- i. Poor handling equipment: - Although the situation has been gradually improving, it is not yet at the required level of efficiency since still there are delays associated with lack of proper handling equipments.
- ii. Shortage of storage: - The port today is heavily congested with basically no room left for future expansion. This challenge is expected to be even greater for a foreseeable future as the demand for the containerized cargo and port services increases.
- iii. Long distance between the port and container depots:- Most of the empty container depots are located several kilometers off the port. During times of empty container operations at the port it is almost impossible to cope with the speed of loading and offloading of containers at the quay side which creates idle time of equipments at the port. This is sometimes very expensive and unacceptable. The resulting costs are borne by the involved parties and not the port.
- iv. Poor infrastructure: Poor infrastructure within the port and also between the port and the container depots is amazingly unjustifiable. The players cited this as one of the greatest challenges as far as port operations and trucking of empty containers is concerned.
- v. Tariffs and fees charged on empty container storage handling and delays are very high even when the failure is on the side of the port authority other government agencies like Kenya Revenue Authority.
- vi. Poor container stacking procedures at the port leads to both container damages and inaccessibility resulting in unnecessary double handling and eventual passing on of the cost to other parties. These poor practices explode the cost associated with container handling. An example of a poor stacking procedure includes stacking of both empty and laden containers together.
- vii. Lack of proper industry organization also creates more problems than solutions leaving the port as the moderator and also the regulator. This leaves the other players without a common voice to demand proper and efficient services. Some shipping lines are usually ready with their own equipments at the port thus leaving other parties helpless and at the mercy of the inefficient port systems.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMENDATIONS

5.1 Summary

This study has unfolded extent to which the Mombasa based empty container logistics firms exercise the practices elsewhere in the developed world. The practice in the local set up was found to alarmingly falling short of what is practiced else where. The challenges facing the logistics firms have also been identified, key among them the state of the road network within the city of Mombasa and along the transportation route. This study found that the policy makers and players at large need to something to improve the empty container logistical practices in Mombasa.

On the other hand, there are multiple parallel elements to the empty container logistics strategies and practices that have benefits and cost implications. The net public benefits of improved empty container logistics are significant reductions in regional truck VMT and emissions. Direct public-sector costs, if any, are likely to be minor. The net private sector benefits are likely to be significant as well, encompassing reduced drayage trips, better equipment supply and control, reduced terminal gate costs, etc. The measurable net benefits to any one party, however, may be slim, and hard to measure. As explained in earlier sections, the success of an empty container logistics practices depends on the balance of incentives.

The cost of transporting empties is very high in Mombasa and in the region in general and it was identified to be equivalent to the cost of shipping laden containers. Containers require special designed trucks or chassis as well as rail wagons which are not only expensive to acquire but also costly to maintain. Further, poor road infrastructure and traffic jams both within and outside the port and along the roads leading to the port were also identified as some of the factors hampering the free flow of empty containers.

Shipping lines are unable to match demand and supply for empty boxes for both inbound and outbound cargo. Competitive rivalry amongst shipping lines more often than not impede cross line utilization of the empty boxes.

Shortage of storage space at the container depots has resulted to placement of containers any how at the road reserve, estates, basically anywhere. This problem will not ease up since there is no land for the port expansion nor space to set up near or expand the existing depots.

Management of empty container was cited as a big challenge in many empty container logistics firms by four of the seven respondents. Other challenges identified include; the turnaround for containers as earlier identified.

An enormous change in IT industry makes it necessary for logistic firms to keep abreast of the new software and technology trends. Most of the times claims and court cases involving containers end up grounding containers for months which exposes them to threats of eventual loss or damage.

Nature of yards and surrounding communities was also identified as a contributor to container insecurity. Since there is no computerized system to enable the shipping lines detect where their containers are automatically, manual tracking is both expensive and time consuming.

5.2 Conclusions

Most of the advanced methods of empty container tracking using Information Systems are non-existent in the local environment. Poor handling equipment: - Although the situation has been gradually improving, it is not yet at the required level of efficiency since still there are delays associated with lack of proper handling equipments. Shortage of storage, Long distance between the port and container depots and all the resulting costs are borne by the involved parties and not the port.

Poor infrastructure within the port and also between the port and the container depots is amazingly unjustifiable. This is one of greatest challenges as far as port operations and trucking of empty containers is concerned. Tariffs and fees charged on empty container storage handling and delays are very high even when the failure is on the side of the port authority other government agencies like Kenya Revenue Authority.

The most evident phenomenon unfolded by this study is that amongst the four practices addressed by this study, there is none that extensively in use in the local logistics firms in Mombasa. Although some of the challenges can not wholesomely be addressed by single parties, a lot need to be done by policy makers to boost this industry towards international standards. Transportation is a nightmare because of the dilapidated state of the roads both within Mombasa and highways.

The liabilities and costs touching container leasing, insurance and repairs on the other hand are usually passed on the shoulders of the consignees because of the risk levels involved, mostly because of the infrastructural difficulties. It is also apparent that there are serious problems on the disposal of containers. This is witnessed through up hazard placement of containers any where in the city. Through this study it was discovered that there lacks an effective information systems as exists else where for tracking and managing the empty containers, not just in Mombasa, but in the region also. The port of Mombasa was also blamed as a factor contributing to inefficient empty containers handling at the same time charging exorbitant prices for the same.

5.3 Recommendations

This study brings out several recommendations that can help the empty container logistics industry players and the policy makers, particularly the government to enhance the industry for accelerated moves and cost savings.

- i. Improvement of the railway trucks and wagons and railway network should be embraced for increased efficiency. An efficient railway system would carry much of the traffic easing the pressure on the roads.
- ii. The shipping lines should find modalities of working together as partners and not as rivals. This will enable the shipping lines to cross use empty containers from the other shipping lines instead of shipping in the empties.
- iii. Development of many more dry ports is a way forward towards curbing shortage of the empty container storage. The plan to reclaim the land at Kibarani for this purpose should be highly prioritized.
- iv. The empty logistics container management should be enhanced and adoption of international management techniques be embraced by the players.
- v. This study revealed that there exist no standardized information systems for management and tracking of the empty containers in Mombasa and the region at large.
- vi. There is need for the industry layers; The port of Mombasa, The Rift Valley Railways (RVR), the Shipping lines, Trucking companies, Clearing and forwarding agents, and others to work together to enhance the operating standards in the industry.

5.3 Limitations of the Study

The study depended on interviews and discussions with respondents based in Mombasa. It would have improved the findings of this document if some of the logistics firms based in Nairobi would have also been involved in this study.

This study also focused on the ocean carrier's and empty container logistics firm's perspectives. The study would have generated better view of the practices and challenges if all the other players would have been given chance to fill the questionnaires.

The data used in this study was mostly collected from only one senior respondent in each of the targeted organization. Possibly, the results could have differed slightly if the representative of each management level was interviewed or maybe about five (5) questionnaires were dispensed for each organization.

5.4 Suggestion for Further Study

While the outlines of the empty container logistics challenge and a short-term logistics strategy are clear, there remain numerous unanswered detail questions and points where estimates have been made in the absence of solid data. As the marine intermodal industry in the world moves toward additional reuse flexibility, depot-direct off-hire, and the use of Internet-based systems, both private and public interests would be served by additional research into some of the issues below:

Off-dock container depot storage and land requirements: Container depots are supposed to typically located very close to the ports. Appropriate land for future development and expansion is simply unavailable and in cases where a piece is available, it is prohibitively expensive. Port growth and adjacent industrial/commercial growth have tightened the supply of land at the same time that community concerns have limited the ability of existing depots to expand. Research is needed into the long-term regional depot requirements and associated location issues to accommodate future demand of space for storage of containers in Mombasa.

Container Logistics and Pollution: Traffic jams are a common phenomenon in the city of Mombasa particularly on all roads leading to the port of Mombasa and depots. A study need to be carried out to unfold the extent to which empty container logistics contribute to this global challenge.

Studies to come up with Simulation models on the issues relating to handling and stacking of cargo, Quay transfers to and from ships need to be developed for the port and depots in Mombasa in order to solve problems related to empty container logistics operations.

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1. * Boston Starline Lines
2. * Eberhard Lines (Andrew Weir Shipping Limited)
3. * Transmar Shipping Company
4. * Coastal Efficiency Lines
5. * Suez Canal Shipping Company, Agents of:
 - 1. * Aguardo Messine and Company
6. * Ocean Freight (E.A) Limited, Agents of:
 - 1. * Mediterranean Shipping Company
7. * G&G-Breath Shipping, Agents of:
 - 1. * Du - Demanche Africa - Union
8. * Dooval, Agents of:
 - 1. * CHA CGM
9. * African River Agencies Limited, Agents of:
 - 1. * (China) Container Lines (C.C.L)
10. * P.I. (K) Ltd, Agents of:
 - 1. * P.I. (Pacific International Lines)
11. * W.E.C Lines (Kenya) Limited, Agents of:
 - 1. * W.E.C Lines
12. * Mitsui Shipping Agencies Ltd, Agents of:
 - 1. * Mitsui Overseas Lines
13. * Diamond Shipping Services Ltd, Agents of:
 - 1. * Euxine Car Carriers
 - 2. * Ethiopian Shipping Lines

APPENDICES

APPENDIX I: Ocean Carriers & Empty Container Logistic Firms in Kenya

1. Inchcape Shipping Lines, Agents of
 - Mitsui OSK Lines
 - Conti Lines
 - Rostock Harrison lines
 - Ellerman Lines (Andrew Weir Shipping Limited)
 - Transmar Shipping Company
 - Cunard Ellerman Lines
2. Sharaf Shipping Company, Agents of:
 - Ignazio Messina and Company
3. Ocean Freight (E.A) Limited, Agents of
 - Mediterranean Shipping Company
4. GAC-Seaforth Shipping, Agents of :
 - Da I- Deuetche Africa - Linien
5. Dodwell, Agents of
 - CMA CGM
6. African Liner Agencies Limited, Agents of
 - Global Container Lines (G.C.L)
7. PIL (K) Ltd, Agents of :
 - PIL (Pacific International Lines)
8. WEC Lines (Kenya) Limited, Agents of:
 - W.E.C Lines
9. Motaku Shipping Agencies Ltd, Agents of
 - Metis Overseas Lines
10. Diamond Shipping Services Ltd, Agents of:
 - Eukor Car Carriers
 - Ethiopian Shipping Lines

- APL (American President Lines)
11. Kenya National Shipping Lines, Agents of
 - Kenya National Shipping Lines
 12. East African Commercials Shipping, Agents of
 - H. Stinnes Linien (G.M.B.H)
 - NYK Line (Nippon Yusen Kaisha)
 13. Maersk Kenya Limited, Agents of:
 - Maersk Sealand
 - Safmarine
 14. Delmas (K) Limited, Agents of:
 - Delmas
 15. Sturrock Shipping Kenya Limited
 16. Kuehne & Nagel Limited
 17. Star East Africa, Agents of:
 - Laurel Navigation Incorporated
 18. Spanfreight Shipping Limited
 19. East African Commercials Shipping, Agents of
 - Deutsche Seereederei Rostock- DSR Company

Figure 6.1: Top 10 Container shipping companies in order of TEU capacity

COMPANY	TEU Capacity	Market Share	Number of ships
Maersk Group	1,665,272	18.2%	849
MSC	865,890	8.6%	299
CMA CGM	507,954	5.6%	256
Evergreen Marine Corporation	477,911	5.2%	153
Hapag-Lloyd	412,344	4.5%	140
China Shipping Container Lines	346,493	3.8%	111
American President Lines	331,437	3.6%	99
Hanjin-Senator	328,794	3.6%	145
COSCO	322,326	3.5%	118
NYK Line	302,213	3.3%	105

Source <http://en.wikipedia.org/wiki/containerization>, 2007

APPENDIX II: Questionnaires & Interview Guidelines

DECLARATION:

This research aims at understanding how your company and other empty containers logistics firms manage their fleet of empty containers. It also seeks to identify and document the challenges facing the empty container logistics players. There will be no wrong or right answers to the questions asked in this questionnaire. The result of this survey shall be kept confidential and will strictly be used for academic purpose only.

Your honest participation in this survey is highly appreciated in advance.

SECTION A: FIRM'S INFORMATION

1. Name of your company: _____
2. Year of establishment: _____
3. Ownership structure:
 - Local
 - International
 - Both
4. The type of business you are engaged in:
 - Transport
 - Container Leasing
 - Ocean Carrier
 - Port Services
 - Clearing agent
 - Cargo Consolidators
 - Others (specify): _____

SECTION B: PRACTICES

[1.] Transportation of Containers:

(a.) How many trucks do you own:

- Less than 10.
- 10 – 30
- 30 – 50
- 50 – 70
- Above 70 (specify): _____

(b.) How many of the trucks you own are involved in containerized cargo transportation (state).

(c.) Who organizes for container picks and returns?

- Consignee
- Shipper
- Transporter
- Clearing Agent
- Others (list): _____

(d.) Who is responsible for charges associated with container picks and drops at the logistic centers?

- Consignee
- Shipper
- Transporter
- Clearing Agent
- Others (list): _____

SECTION B: PRACTICES

[1.] Transportation of Containers:

(a.) How many trucks do you own:

Less than 10.

10 – 30

30 – 50

50 – 70

Above 70 (specify): _____

(b.) How many of the trucks you own are involved in containerized cargo transportation (state).

(c.) Who organizes for container picks and returns?

Consignee

Shipper

Transporter

Clearing Agent

Others (list):

(d.) Who is responsible for charges associated with container picks and drops at the logistic centers?

Consignee

Shipper

Transporter

Clearing Agent

Others (list): _____

(e.) What practices specific to your organization aim at reducing the 'street turns' of empty containers? (Explain).

(f.) What Challenges would you cite as worth special attention in regard to empty container transportation? (list)

- i. _____
- ii. _____
- iii. _____
- iv. _____

[2.] Container Leasing

(a.) Who arranges for the container hires or leases?

- Consignee
- Shipper
- Transporter
- Clearing Agent
- Other (Specify): _____

(b.) What types or modes of leases are provided for when leasing containers? (Explain)

(c.) What is the cost of hiring/leasing empty containers?

20Feet: Kshs. _____
40Feet: Kshs. _____

(d.) Apart from size, how else does this cost vary:

- According to the Mode of transportation
- According to the hire Duration
- According to special feature e.g. Refrigeration
- Others (state):

(e.) Are there other charges deducted by the empty container leasing firms when the boxes are finally returned?

- YES
- NO

(f.) If YES, what charges:

- YES (I.) _____
- YES (II.) _____
- YES (III.) _____

(g.) What would you cite as the greatest challenges in regard to empty container leasing? (Explain)

[3.] Insurance, Damages & Repairs

(a.) Who is responsible for the empty container insurance?

- Consignee
- Shipper
- Transporter/Trucking firm
- Clearing Agent
- Ocean Carrier

Others (specify): _____

(b.) In case containers are damaged, who pays for the repairs?

Consignee

Shipper

Transporter/Trucking firm

Ocean Carrier

Others (List): _____

(c.) If the containers are fatally damaged and paid for, is the party involved required still to drop them at the logistics center?

YES

NO

(d.) If YES, who pays for the container drop at the center? (explain)

(e.) What are the challenges facing the empty container logistic firms in regard to empty container handling and management, (Please List and Explain)

[4.] Container Disposal & Security

(a.) What are the factors considered when disposing off containers?

Age

Extent of Damage

Repositioning Costs

Others (Specify): _____

(b.) How is the disposal process carried out? (Explain)

(c.) Is there a standard price consideration for containers being disposed?

YES

NO

(d.) If NO briefly explain how the disposal price is assessed.

(e.) Do you consider empty container as a big problem in your organization? (explain)

[5.] Container Tracking & Security

(a.) How do you track the movement of containers?

Manually

Use of Computer Based Information systems

Both

None

(b.) If your organization uses Computer Based Information Systems, please list these systems and indicate their use.

SYSTEM NAME	TRACKING	OTHERS (Specify)
1.		
2.		
3.		
4.		

(c.) Who is responsible in the empty container tracking process?

Consignee

Shipper

Transporter/Trucking firm

Clearing Agent

Ocean Carrier

Others (List): _____

(d.) In case of loss, who takes up the responsibility?

Consignee

Shipper

Transporter/Trucking firm

Clearing Agent

Ocean Carrier

Others (List): _____

(e.) List any other security measures or practices in your organization directed towards tracking empty containers.

(i.) _____

(ii.) _____

(iii.) _____

(iv.) _____

(f.) In your view what would you cite as the greatest challenges facing logistics firms involved in empty container logistics in regard to Tracking and Security?

(i.) _____

(ii.) _____

(iii.) _____

(iv.) _____

[6.] Port Operations & Stacking

(a.) What is the obligation of the Kenya Ports Authority in regard to empty container logistics? (Explain)

(b.) Are there any policies and procedures in place at the port to discourage empty container pile up at the port? (Explain)

(i.) _____

(ii.) _____

(iii.) _____

(c.) What are the costs associated with empty container handling at the port of Mombasa?

(i.) _____

(ii.) _____

(iii.) _____

(d.) How can you describe the demand and the supply of empty container in Kenya today?

INBOUND:

- Low
- Medium
- High
- Very High

OUBOUND:

- Low
- Medium
- High
- Very High

(e.) What challenges can you cite as critical in regard to management of empty containers at the port today?

APPENDIX III: Definition of Terms

Average Annual Daily Truck Traffic (AADTT). The total volume of truck traffic on a highway segment for one year, divided by the number of days in the year.

Backhaul. The process of a transportation vehicle (typically a truck) returning from the original destination point to the point of origin. A backhaul can be with a full or partially loaded trailer.

Barge. The cargo-carrying vehicle that inland water carriers primarily use. Basic barges have open tops, but there are covered barges for both dry and liquid cargoes.

Bill of Lading. A transportation document (paper or electronic) that is the contract of carriage containing the terms and condition between shipper and carrier.

Bottleneck. A section of a highway or rail network that experiences operational problems such as congestion. Bottlenecks may result from factors such as reduced roadway width or steep freeway grades that can slow trucks.

Breakbulk Cargo. Cargo of non-uniform sizes, often transported on pallets, sacks, drums, or bags. These cargoes require labor-intensive loading and unloading processes. Examples of breakbulk cargo include coffee beans, logs, or pulp

Bulk Cargo. Cargo that is unbound as loaded; it is without count in a loose unpackaged form. Examples of bulk cargo include coal, grain, and petroleum products.

Capacity. The physical facilities, personnel and process available to meet the product of service needs of the customers. Capacity generally refers to the maximum output or producing ability of a machine, a person, a process, a factory, a product, or a service. In regards to the transportation system, this term references the ability of the transportation infrastructure to accommodate traffic flow.

Chassis. A trailer-type device with wheels constructed to accommodate containers, which are lifted on and off.

Consignee. The receiver of a freight shipment, usually the buyer.

Container. A "box", typically ten to forty feet long, which is used primarily for ocean freight shipment. For travel to and from ports, containers are loaded onto truck chassis' or on railroad flatcars.

Consignor. The sender of a freight shipment, usually the seller.

Container. A large, standard sized metal box into which cargo is packed for shipment; containers are designed to be moved with common handling equipment, functioning as the transfer unit between modes rather than the cargo itself.

Containerization. A shipment method in which commodities are placed in containers, and after initial loading, the commodities per se are not rehandled in shipment until they are unloaded at destination.

Containerized Cargo. Cargo that is transported in containers that can be transferred easily from one transportation mode to another.

Contract Carrier. Carrier engaged in interstate transportation of persons/property by motor vehicle on a for-hire basis, but under continuing contract with one or a limited number of customers to meet specific needs

Deadhead. The return of an empty transportation container/trailer back to a terminal or facility. Commonly-used description of an empty backhaul.

Demurrage. The carrier charges and fees applied when rail freight cars and ships are retained beyond a specific loading or unloading time.

Freight Forwarder. A person whose business is to act as an agent on behalf of a shipper. A freight forwarder frequently consolidates shipments from several shippers and coordinates booking reservations.

Gross Vehicle Weight (GVW). The combined total weight of a vehicle and its freight.

In-bond Shipment. A shipment status in which goods are permitted to enter a country and temporarily stored for transport to a final destination where the duty will be paid.

Inbound Logistics. The movement of materials from shippers and vendors into production processes or storage facilities.

Intermodal Transportation. Transporting freight by using two or more transportation modes such as by truck and rail or truck and oceangoing vessel. For example, a shipment moved over 1000 miles could travel by truck for one portion of the trip, and then transfer to rail at a designated terminal.

Intermodal Terminal. A location where links between different transportation modes and networks connect.

Lift-on/Lift-off (lo/lo) Cargo. Containerized cargo that must be lifted on and off vessels and other vehicles using handling equipment.

Line Haul. The movement of freight over the road/rail from origin terminal to destination terminal, usually over long distances.

Logistics. All activities involved in the management of product movement; delivering the right product from the right origin to the right destination, with the right quality and quantity, at the right schedule and price

Port Authority. State or local government that owns, operates, or otherwise provides wharf, dock, and other terminal investments at ports.

Pull Logistics System. "Just in time" logistics system driven by customer demand and enabled by telecommunications and information systems rather than by manufacturing process and inventory stockpiling.

Push Logistics System. Inventory-based logistics system characterized by regularly scheduled flows of products and high inventory levels.

Reverse logistics. A specialized segment of logistics focusing on the movement and management of products and resources after the sale and after delivery to the customer. Includes product returns and repair for credit.

Shipper. Party that tenders goods for transportation.

Shipping Manifest. A document that lists the pieces in a shipment.

TEU- Twenty-foot equivalent unit. A standard size intermodal container.

Third-party Logistics (3PL) Provider. A specialist in logistics who may provide a variety of transportation, warehousing, and logistics-related services to buyers or sellers. These tasks were previously performed in-house by the customer.

Throughput. A warehousing output measure that considers the volume (weight and number of units) of items stored during a given time period.

Ton-mile. A measure of output for freight transportation; reflects weight of shipment and the distance it is hauled; a multiplication of tons hauled by the distance traveled.

Transit time. The total time that elapses between a shipment's delivery and pickup.

Truckload (TL). Quantity of freight required to fill a truck, or at a minimum, the amount required to qualify for a truckload rate.