

**SUPPLY CHAIN LEAGILITY AND PERFORMANCE OF
HUMANITARIAN ORGANIZATIONS IN KENYA**

BY

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DECLARATION

I declare that this research project is my original work and has never been submitted to any other University for assessment or award of a degree.

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D61/67763/2011

This project has been submitted for examination with my approval as university supervisor.

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DEDICATION

To all humanitarians who dedicate their lives to serving humankind.

ABSTRACT

The world is facing an increase in humanitarian crises due to climate change and terrorism. This calls for new supply chain strategies in handling the volatile and changing demands that these humanitarian disasters present. The lean and agile supply chains have been studied separately over the years, but there is great need to study them as a hybrid leagile supply chain. This paper explores the concept of supply chain leagility and in particular its relationship to performance of humanitarian organizations in Kenya, in an effort to improve performance of humanitarian organizations particularly with the escalating number of humanitarian disasters and increasing demands from donors. The objectives of this study were to determine the extent of implementation of supply chain leagility in humanitarian organizations in Kenya, to determine the relationship between supply chain leagility and performance of humanitarian organizations in Kenya and to examine the challenges in the implementation of leagile supply chains in humanitarian organizations. In order to achieve the objectives of the study, the researcher used a descriptive research design which targeted 70 humanitarian organizations carrying out their operations in Kenya. Out of the 70 humanitarian organizations actively involved in humanitarian work in Kenya, the study selected 40 organizations which were considered a sufficient representation of the whole population. The researcher collected data from key supply chain personnel who included supply chain managers, officers or their equivalents in these forty organizations. Primary data was collected with the use of a self-administered, structured questionnaire. The study concluded that most humanitarian organizations in Kenya have to a large extent implemented supply chain leagility and there is a direct relationship between supply chain leagility and performance of humanitarian organizations in Kenya. The results of the regression analysis showed that there was a positive correlation of 78.8% between supply chain leagility and organizational performance. The study recommends that humanitarian organizations should invest in ICT, train their staff to better manage leagile supply chains, share information internally and with external partners, collaborate with other HA organizations and implement organization structures that support leagility. The researcher faced several limitations when conducting this study. One of the main limitations was getting responses on time from the respondents due to organizational polices and tight working schedules. It would also be useful for future researchers and academicians to conduct more research on supply chains in man-made disaster environments like terrorism sites and also supply chains of corporations as more of them continue to engage in humanitarian work. This will assist in designing more improved and efficient supply chains that can cope with the evolving humanitarian challenges.

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ABBREVIATIONS AND SYNONYMS

EDI	Electronic Data Interchange
HA	Humanitarian Aid
ICS	Information Communication System
ICT	Information Communication Technology
NGO	Non- Governmental Organization
OCHA	Office of the Coordination of Humanitarian Affairs
SCM	Supply Chain Management
UNEP	United Nations Environmental Programme
VMI	Vendor Managed Inventory

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Natural and man-made disasters have significantly increased in magnitude and frequency in recent years. This can be attributed to climate change and increase in terrorist activities in different parts of the world. According to the United Nations, natural disasters over the next years will become more severe, often and destructive (UN, 2006). Within a year there are approximately 150,000 deaths and 200 million people who are impaired by the devastating consequences of humanitarian crisis and natural disasters (Fritz, 2012). Kenya has had its fair share of natural disasters which include; drought, famine, floods, food insecurity, diseases and manmade disasters like war and conflict, particularly with the increase of terrorist activities in the country.

An extensive humanitarian relief community has developed since the Second World War (Therien & Lloyd, 2000). This includes multilateral agencies like the United Nations, World Food Programme, Oxfam, Care International, Medicins sans Frontieres and The International Committee of the Red Cross. These international humanitarian organizations are supported heavily by governments, multinational organizations, NGO's, corporates and individuals. Oloruntoba (2006) observes that humanitarian aid is prone to political and military convenience of both donor and recipient countries and often lacks a coordinated plan. With more funding due to increased frequency of disasters, donors are increasingly demanding accountability, transparency and value for money in return for their funding of humanitarian aid organizations.

Wassenhove (2006) concurs and states that donors are becoming more aware of expenses and humanitarian organizations are under greater scrutiny to monitor the impact of aid and not just the input and output but the whole operation. This requires humanitarian organizations to be more professional in managing their operations (Thomas & Kopczak, 2005).

Eighty per cent of humanitarian aid operations comprise logistics activities, making logistics and supply chain management the most important elements in any disaster relief effort, that make the difference between a successful and failed operation (Wassenhove, 2006). The humanitarian supply chain entails preparation, planning, procurement, transportation, storage, tracking and customs clearance of materials used in disaster relief operations. However, to date humanitarian aid organizations continue to rely on standards used in the profit sector (Fenton, 2003). They continue to ignore emerging trends in supply chain management, designed to enable organizations respond to an increasingly challenging and volatile environment. Supply chains are very instrumental in mitigating destruction caused by natural disasters, delivering items to those in need and ensuring that peacekeeping and military operations are carried out smoothly. Managing humanitarian supply chains in the most effective and efficient manner is crucial to donors as well as recipients of humanitarian aid.

1.1.1 The Leagile Concept

The leagile supply chain is a hybrid of the lean and agile supply chains, within a total supply chain strategy. Naylor et al. (1999) defines it as a way of exploiting the lean and agile paradigms with the selection and setting up of a material flow decoupling point. This is the point that separates part of the supply chain oriented towards

customer orders from that based on planning. He adds that this is because there is always need to respond to volatile demand downstream and provide a level schedule upstream from market place.

The lean concept was developed by the Toyota Company and in large part in the Toyota production systems. Lean is a systematic approach to developing a value stream to eliminate all waste, including time and to ensure a level schedule (Naylor et al., 1999). It aims at doing more with fewer resources. Agile systems evolved from flexible manufacturing systems focus on flexible and efficient response to unique customer demand. Christopher (2000) defines agility as achieving rapid response on a global scale to constantly changing markets. It is the ability of the supply chain as a whole and its members to rapidly align the network and its operations to dynamic and turbulent requirements of the demand network (Ismaili & Sharifi, 2006).

Though the lean and agile principles have been used within supply chains for some time, in practice leanness does not imply agility. When markets are volatile or uncertain like in the humanitarian context, leanness needs to be decoupled from part of the supply chain process and combined with agility into a hybrid leagile strategy to create a more responsive supply chain that will deliver aid in an effective and efficient manner.

1.1.2 Organizational Performance

Organizational performance refers to how well an organization achieves its market oriented goals as well as its financial goals (Gunasekruan et al., 1999). It comprises of the actual output or results of an organization as measured against its intended output

(Richard et al., 2009). Organizational performance of NGO's is evaluated on their ability to raise funds to fulfill their organizational goals and objectives. Defining organizational performance for non-profit organization is quite a task due to the vast diversity of organizational missions and objectives and the fact that these organizations have multiple stakeholders whose priorities differ significantly (Pavicic et al., 2014).

Ramalingam et al. (2009) define performance in the humanitarian perspective as the collective performance of a complex system of international, national and locally based organizations which works to save lives, alleviate suffering and maintain human dignity both during and in the aftermath of man-made crisis and natural disasters. As well as working to prevent and strengthen preparedness for the occurrence of such situations. Effective performance means undertaking work in ways that are consistent with humanitarian principles, mobilizing and deploying sufficient financial materials and human resources in ways that are relevant, well managed, accountable, impartial, and durable and ensure good quality.

There are cross organizational efforts to standardize aspects of performance management in humanitarian organizations, but there is still little consistent or collective working across the whole humanitarian sector. Most performance related initiatives are still taking place at the level of individual projects and programmes. The system is also reliant on information on performance from different sources including separate reports, disjointed research and very occasional joint evaluation (Ramalingam et al., 2009).

1.1.3 Humanitarian Organizations in Kenya

Kenya experiences a myriad of humanitarian catastrophes which include drought, famine, floods, disease outbreaks, food insecurity, conflict and war. The largest refugee population in the world of 600,000 people is found in Kenya. With 450,000 in Daadab, nearly 100,000 in Kakuma and over 50,000 in Nairobi (OCHA, 2014). This substantiates the range and magnitude of humanitarian activities in the country. There is a heavy presence of UN affiliated organizations as well as international NGO'S that engage in disaster, relief, health, reconstruction and development activities in various parts of the country.

With a majority of natural and manmade disasters occurring in developing countries, quite a number of humanitarian organizations have set up offices or have regional headquarters in developing countries. This facilitates quick response to disasters and enables coordination and monitoring of disaster relief operations. The European Union being the single largest donor of HA in the world has its regional headquarters in Nairobi, The European Commission Humanitarian Aid Department (ECHO). The United Nations Environmental Programme (UNEP) and United Nations Human Settlements Programme (UN-HABITAT) are also headquartered in Nairobi.

Humanitarian organizations in Kenya are either founded in Kenya or originate from foreign countries and set up autonomous offices in Kenya. These organizations provide humanitarian assistance according to their mandates and level of funding, in ways that alleviate suffering, are supportive to recovery and long-term development. Humanitarian organizations in Kenya rely on funding from donors and well wishers to finance their operations, hence the enormous accountability responsibility. Their

finance, procurement and supply chain operations are subject to audits whose findings are presented to donor organizations.

Humanitarian organizations in Kenya have been the first line of response when Kenyans are faced by various humanitarian challenges. They play a significant role when the country faces natural and man-made humanitarian crises. This is evident from the work they do in arid areas, during floods, disease outbreaks, and conflict and terrorist activities in the country.

1.2 Statement of the Problem

Colossal amounts of money from; governments, NGO's, corporates, multinational organizations and individuals go into funding humanitarian organizations every year. However, humanitarian supply chain management is a generally under researched area. In contrast, components encompassing commercial and corporate supply chains and the logistical activities that execute distribution transport, and supply efforts are well researched and have developed into a successful business industry (Wassenhove, 2006). He continues to argue that humanitarian organizations are about fifteen years behind their private sector counterparts who realized way back the importance of using efficient supply chains. The disparity between humanitarian SCM and commercial SCM has led many humanitarian logisticians to explore commercial logistics best practices and implement analytic structures derived from the commercial sector (Axelsen, 2013).

Supply chain leagility has been an area of interest for some researchers. Krishnamurthy and Yauch (2007) found out that it is possible for a corporation to

pursue both lean and agile manufacturing strategies by adopting a leagile infrastructure. Rahiminia and Moghadisan (2010), in their study concluded that that there is need for hospitals to be highly agile and at the same time they can benefit from lean strategies. Scholten et al. (2010) came to a conclusion that the commercial concept of leagility when responding to disaster relief holds strong potential for increasing efficiency and effectiveness.

A number of studies have been conducted on humanitarian supply chain management in Kenya and East Africa. Nyamu (2012) in his study established that the main challenges facing humanitarian supply chain management are; lack of recognition of the role of SCM in humanitarian operations, delays in humanitarian operations due to domestic barriers, demand uncertainty and high costs. Kinyua (2013) supported this by concluding that half of humanitarian organizations have non performing supply chains. Lisanza (2013) came to a conclusion that most of the international humanitarian organizations in East Africa have integrated their SCM functions.

There is need to study the leagile supply chain and more so in a humanitarian perspective. Therefore more research needs to be done on the humanitarian supply chain and more specifically on the relationship between supply chain leagility and performance of humanitarian organizations in Kenya. This research sought to bridge the gap by answering the following questions; What is the extent of implementation of leagile supply chains by humanitarian organizations in Kenya? What is the relationship between supply chain leagility and performance of humanitarian organizations in Kenya? What are the challenges in the implementation of leagile supply chains in humanitarian organizations in Kenya?

1.3 Research Objectives

This study consisted of three main objectives which were as follows;

- i. To determine the extent of implementation of supply chain leagility in humanitarian organizations in Kenya.
- ii. To determine the relationship between supply chain leagility and performance of humanitarian organizations in Kenya.
- iii. To determine the challenges in the implementation of leagile supply chains in humanitarian organizations in Kenya.

1.4 Value of the Study

This research project will offer useful findings and insights to humanitarian organizations, policy makers and donors. It will enable them understand the relationship between the leagile supply chain and humanitarian organizational performance. The results of this study will enable managers and other decision makers to implement supply chain leagility to enable their organizations to operate more effective and efficient supply chains that will enhance cost savings and respond to the unpredictable demands of unstable environments.

Researchers and scholars alike can also use this report to pave way for more research in humanitarian supply chain management. Supply chain managers may also use it as they endeavor to design more responsive supply chains. This report will help reduce the over reliance on commercial supply chain management principles in humanitarian supply chain management.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter explores existing relevant literature on the leagile supply chain and the role it plays in humanitarian relief efforts. It reviews literature from various researchers on various relevant aspects of the humanitarian supply chain and the application of the concept of supply chain leagility to improve the performance of HA organizations. Most importantly, based on the literature review the conceptual framework which will set the pace for this research will be developed and presented.

2.2 The Leagile Supply Chain

Volatile and unpredictable environments like humanitarian disasters demand supply chains that will minimize waste and ensure flexibility. They should meet market demand, minimize costs and reduce supply chain risks. The lean and agile paradigms have been researched on, developed and applied in supply chain management in an endeavor to make supply chains more efficient and effective.

Lean emphasizes on reduction of waste of resources by identifying non value adding activities and eliminating them. Lean supply chains ensure value by eliminating all waste in the form of buffer stocks, time and also ensure a level schedule (Aitken et al., 2005). Christopher (2005) observes that a lean supply chain functions best where demand is predictable, requirement for variety is low and volumes are high. Due to the nature of lean supply chains they tend to be more rigid and with respect to humanitarian supply chains they cannot easily adapt to the changing environmental

needs. Therefore, solely a lean supply chain cannot meet the needs of humanitarian aid recipients.

Agility is a business wide capability that embraces organizational structures, information systems, logistics processes and mindsets (Christopher, 2005). Agile supply chains aim at being more flexible and adaptive to changes in the environment and thus have the potential of using more resources (Harrison 1997; Christopher and Towill, 2000). They are more adaptable and responsive to changing environmental needs and allow for excess inventory to ensure flexibility and responsiveness to changing environmental needs.

The agile and lean supply chains may be very distinct and have totally different goals, but some researchers present them as strategies that are mutually supportive (Katayama and Bennet 1999; Naylor et al., 1999; Robertson and Jones, 1999). According to Christopher (2005), leanness may be an element of agility and he suggests that a combination of these concepts can enable an organization to precisely rapidly meet the needs of a volatile market. With more research and new developments in supply chain management, supply chains are adopting more than one strategy to make them more competitive and responsive to market demand. There will be occasions where a purely lean or agile supply chain may be appropriate. However, there will often be situations where a hybrid strategy may be more appropriate (Christopher, 2000).

Leagility is a hybrid of the lean and agile paradigms within a total supply chain strategy by positioning the decoupling point so as to best suit the need for responding to volatile demand downstream yet providing level scheduling upstream from the marketplace (Naylor et al., 1997). The material decoupling point separates the lean and agile supply chains and it is at this point where inventory is held in a generic or modular form and final assembly or configuration is completed when precise customer requirements are known (Christopher & Towill, 2000). The leagile concept also makes use of an information decoupling point which works in parallel with the material decoupling point (Jones & Towill, 1999). This is the furthest point upstream to which information on real demand flows. In a leagile strategy, the lean and agile paradigms operate at different times, but in the same place or at the same time in different places (Christopher & Towill, 2010)

Postponement is one of the key features of leagility, closely related to the decoupling point concept (Rahimnia et al., 2010). It is the delaying of operational activities in a system until customer orders are received rather than completing activities in advance and waiting for orders (Mason et al., 2000). It refers to the process by which the commitment of a product to its final form or location is delayed for as long as possible (Christopher, 2005). Postponement supports leagility through the use of common platforms, components or modules so that final assembly or customization of the product can take place when the final customer is identified (Christopher & Towill, 2000). In commercial supply chains postponement ensures that market demand is responded to in a more accurate and sensitive manner. This is achieved by facilitating customized and localized assembly, virtual integration by supply chain operations that

are linked to customer orders and process integration through cross functional links (Van Hoek, 2000).

2.3 Theory of constraints

The theory of constraints developed by Eliyahu Goldratt in the 1970's is a method for identifying the most important limiting factor or constraint that hinders the achievement of a goal by systematically improving the constraint until it is no longer a limiting factor (Goldratt, 1990). It takes a scientific approach to improvement and assumes that every complex system consists of multiple linked activities, one of which is a constraint to the whole system. To aid in achievement of system goals the theory of constraints provides a methodology for identifying and eliminating constraints, tools for analyzing and resolving problems and a method of measuring performance and guiding management decisions (Goldratt, 1990)

This theory treats a supply chain as a system which is a group of connected components that work together to transform input resources to output effects according to the goals of the system. It provides useful tools which can be easily applied to supply chains to make them more effective and efficient (Rudnicki, 2011). Lean supports capitalizing on available resources, which is the underlying concept of exploiting constraints such as time, capacity and inventory.

Leagile tools can be applied to the greatest advantage in humanitarian supply chains to eliminate waste, reduce costs shorten lead times, increase capacity, improve flexibility and responsiveness. This definitely will improve humanitarian organizational performance by ensuring optimum utilization of resources, time and

expenditure targets and needs of aid recipients are met, more lives are saved and enhanced impact of activities and projects.

2.4 Overview of the Humanitarian Supply Chain

With increase in humanitarian disasters both globally and locally, supply chain professionals now more than ever are faced with the challenge of designing and managing supply chains that will meet donor expectations and deliver value to those in need. They are in continuous pursuit of new and innovative ways of building efficient and effective supply chains that will adapt to rapid changes in disaster response environments.

A supply chain is a network of organizations that are involved through upstream and downstream linkages in the different processes and activities that produce value in the form of products or services in the hands of the ultimate consumer (Christopher, 2005). Supply chain management is the management across a network of upstream and downstream organizations of material, information and resource flows that lead to the creation of value in the form of products and services. There may be contextual differences in the private and humanitarian sectors, but supply chain management is the centre of any given logistical operation (Wassenhove, 2006).

Humanitarian supply chain management involves the planning and management of all activities related to material, information and financial flows in disaster relief operations, it also includes coordination and collaboration with supply chain members, third party service providers and other humanitarian organizations. It ensures the management and efficient flow of aid materials, services and aims at

alleviating human suffering (Lijo & Ramesh, 2012). Each of the phases of a humanitarian supply chain has its unique requirements and therefore collaboration and cooperation with supply chain partners as well as other humanitarian organizations is critical to humanitarian supply chain performance. Efficient and well managed humanitarian supply chains are crucial in disaster relief operations and ensure preparedness, immediate response, reconstruction and recovery.

The humanitarian supply chain is in many ways similar to a commercial supply chain though there are major differences between the two supply chains. Commercial supply chains are based on marketplace structures and customer demand while humanitarian supply chains are based on vulnerable populations and their needs rather than customer demand (Axelsen, 2013). The goal of the humanitarian supply chain is not reduced to delivering goods and services to the final consumer but delivering goods and services to alleviate human suffering.

The complex and uncertain nature of disasters makes it difficult to centralize distribution, manage costs, calculate needs in humanitarian supply chains as opposed to commercial supply chains where demand can be easily forecasted and costs can be easily managed. Both commercial and humanitarian supply chains aim at being more efficient by eliminating waste though the unpredictable nature of humanitarian supply chains makes it quite difficult to have zero waste along the supply chain. By constantly working in environments with high degrees of uncertainty humanitarian organizations end up becoming specialists in the implementation of agile systems (Charles et al., 2010).

2.5 Humanitarian Organizational Performance

Donors increasingly demand accountability, transparency and value for money in return for their sponsorship of humanitarian aid agencies (Scholten et al., 2010). They have great interest in knowing how successful an organization is in accomplishing its goals with the resources they have provided. According to a (2009) Oxfam report aid should be relevant, of good quality, well managed and should be accountable with mechanisms to challenge failure and abuse. It should also build durable solutions and be sufficiently resourced. This emphasizes why mechanisms for measuring performance of humanitarian organizations are of great importance. Though, NGO's may have multiple stakeholders whose priorities differ therefore making it difficult to define humanitarian organizational performance (Pavicic et al., 2014).

The overall performance of a non-profit organization is dependent on its ability to raise funds in order to fulfill the organization's mission and goals (Ritchie & Kolodinsky, 2003). Poister (2003) argues that humanitarian organizations should not concentrate solely on currently needed financial resources and an exclusive focus on fundraising and financial indicators since this shifts attention from other aspects of performance related to output, effectiveness, quality and customer satisfaction. He notes that measures mostly revolve around the outcome of organizational activities which are measured by assessing the overall impact of the activities performed as well as their efficiency and efficacy in relation to resources spent.

Different scholars have derived metrics to measure humanitarian performance Beamon (1999), outlines a three part performance measurement of resource, output and flexibility metrics which measure efficiency, effectiveness and ability to respond

to a changing environment respectively. Kumar et al., (2013) evaluated performance of leagile supply chains and categorized it as organizational performance that can be measured in terms of market share, return on investment, sales growth and green image; operational performance whose metrics are product cycle time, due date performance, cost and quality; customer service performance evaluated in terms of customer satisfaction, delivery dependability, responsiveness and order fill capacity; Flexibility, measured in terms of product development flexibility, sourcing flexibility and IT flexibility.

2.6 Supply Chain Leagility and Performance of Humanitarian Organizations

The leagile supply chain by virtue of being lean and agile is a more superior supply chain thus enhancing performance of humanitarian organizations by incorporating both lean and agile aspects into their supply chains. It ensures efficiency and effectiveness along humanitarian supply chains resulting to more efficient resource utilization, reduction in response time, improved impact of activities and projects and guarantees that time and expenditure targets are met.

Humanitarian supply chains characteristically hold volumes of a variety of items needed by aid recipients. These supply chains usually experience loss of product which is waste between donor and recipient due to theft, misappropriation, poor tracking and control as well as product deterioration (Taylor & Pettit, 2009). Supply chain leagility can avert this by integrating supply chains, use of ERP and JIT as well as increasing minimum quantities to reduce transportation costs and establishing a less dense network of facilities to minimize theft (Diaz et al., 2007). Humanitarian supply chains exhibit three dominating costs; cost of supplies, distribution costs and

inventory holding costs. Leagility can control these costs along the supply chain hence enhancing performance.

Efficiency of humanitarian supply chains can be achieved by incorporating leagile practices therefore capitalizing on personnel, equipment, facilities and available capacity. Smooth operations ensure that resources needed in humanitarian efforts flow smoothly by eliminating capacity bottlenecks and constraints to enhance performance. Flexibility is a key feature of leagile supply chains. In a humanitarian perspective it is the ability to respond to disasters of different magnitude, while providing a variety of items to the recipients of aid (Beamon & Balcik, 2008). There are diverse needs in humanitarian disasters requiring supply chains to be more flexible to meet the ever changing needs of recipients of humanitarian aid. Leagility enables a responsive supply chain that is able to meet stakeholder demands by reacting quickly and cost effectively to changing market requirements, its enablers include; a collaborative network of partners, information technology and knowledge management (Gunasekeran et al., 2008).

Supply chain leagility facilitates reliable and resilient supply chains to boost performance of humanitarian organizations. Reliable humanitarian supply chains ensure that inventory gets delivered on time and in sufficient amounts, while resilient supply chains are adaptable to different desired states depending on the type and magnitude of the disaster. Collaboration with other humanitarian partners and organizations, robust IT infrastructure and staff with the required expertise are key.

2.7 Challenges to the Implementation of Leagile Humanitarian Supply Chains

Humanitarian organizations face a myriad of challenges when it comes to the implementation of leagile supply chains. These include internal and external challenges that an organization may have no control over. These challenges may totally prevent or hinder the implementation of leagile supply chains.

There is inadequate funding from donor governments, corporations and individuals for ICT systems. They focus more on relief donations for immediate solutions to immediate situations and ICT systems are not considered fundamental (Reynolds et al., 2005). Humanitarian organizations therefore lack adequate funding for the implementation of ICT systems that drive supply chain leagility.

Government policies and regulations may impede the implementation leagile supply chains. This may range from the nature of the relationships they have with donor governments which may affect funding of HA organizations, the red tape involved in the importation and clearance of goods, to the taxes imposed on various items that may be critical in leagile supply chains. Government also has an oversight role in humanitarian affairs and may sometimes obstruct humanitarian efforts.

Non Governmental Organizations in the developing world typically have decentralized organizational structures in which field offices exhibit a high level of autonomy with minimal oversight by the headquarters. There are critical benefits of a decentralized structure, but it considerably complicates the implementation and

management of an organization wide ICS infrastructure (Reynolds et al., 2005). This definitely curtails the development and implementation of leagile supply chains.

Non Governmental organizations and other relief organizations face particularly complex issues and challenges in the establishment and management of effective ICS, that are not only connected to the technological capacity of an NGO, but also to its mission culture, structure, people, policies and administrative strategies (Reynolds et al., 2005). These systems determine how successfully humanitarian aid organizations are able to respond to complex humanitarian emergencies, and are also vital in the implementation of leagile supply chains.

A majority of NGO's express the willingness and desire to cooperate with each other, but competition for scarce resources presents challenges to joint communication and information sharing. This happens especially when information is considered proprietary or of significant value to organizations competing for funding from the same sources (Reynolds et al., 2005). It prevents the implementation of leagile supply chains because collaboration with other HA organizations cannot be achieved without information sharing.

Majority of disaster relief operations take place in underdeveloped regions. These regions have poor or non-existent physical and communication infrastructure, therefore impeding disaster relief operations. Leagile supply chains are not easy to implement in these regions because they thrive on good physical and communication infrastructure. This is one of the major challenges in the implementation of leagile supply chains in developing and underdeveloped countries.

2.8 Summary and Research Gap

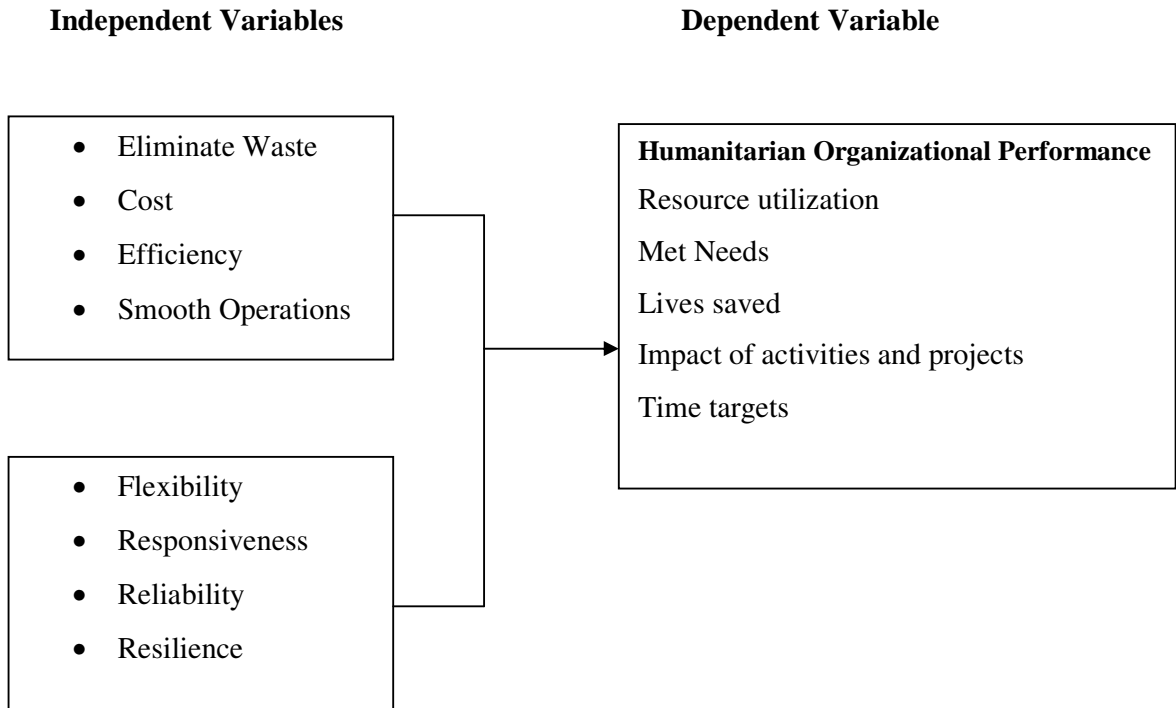
Humanitarian supply chain management plays a key role in disaster relief operations and humanitarian assistance. The way supply chains operate has a major impact on effectiveness and efficiency of humanitarian supply chains. This is of importance to donors and recipients of humanitarian aid.

Previously the lean and agile paradigms have been studied separately, but there is need to study them as a hybrid strategy and supportive of each other which brings into play the concept of supply chain leagility. There is need to determine if supply chain leagility can improve performance of humanitarian aid organizations in Kenya.

2.9 Conceptual Framework

The conceptual framework puts into perspective aspects of the leagile supply chain. The eight independent variables were investigated to determine their relationship with respect to humanitarian organizational performance in Kenya, as presented in figure 2.1

Figure 2.1 Conceptual Framework on supply chain leagility and humanitarian organizational performance



Source: Researcher (2014)

A leagile supply chain eliminates waste, ensures smooth operations, efficiency, cost savings, flexibility, responsiveness, reliability and resilience .This enhances organizational performance in humanitarian organizations in terms of resource utilization, meeting needs, saving lives, enhancing the impact of projects and activities and ensuring time targets are met.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology that was utilized for this research. It outlines how the collection, measurement and analysis of data was conducted. This section is an overall scheme, plan or structure conceived to aid in answering the research questions. The procedures and techniques that were used in the collection, processing and analysis of data are set out. Specifically the following subsections were included; research design, target population, data collection instruments, data collection procedures and finally data analysis.

3.2 Research Design

The research utilized a descriptive research design. A descriptive research design is used when a researcher wants to describe a situation or condition at hand (Kothari, 2005). It examines aspects such as opinions, abilities, behavior, knowledge and beliefs of individuals, groups or situations. This design was considered appropriate for this study.

3.3 Target Population

This research targeted humanitarian organizations carrying out their operations in Kenya. As derived from the NGO Coordination Board of Kenya, it was estimated there are 70 humanitarian organizations that are actively involved in humanitarian work in Kenya.

3.4 Sample Design

Out of 70 humanitarian organizations' in Kenya as derived from the NGO Coordination Board, the study chose 40 organizations which were considered a sufficient representation of the whole population. According to Mugenda & Mugenda (2003), a representative sample is one which is at least 10% of the population thus the choice of 40 organizations was considered as representative. Purposive sampling was used to select humanitarian organizations for the study.

3.5 Data Collection

The researcher collected data from key supply chain personnel who included supply chain managers, officers or their equivalents in these forty organizations. Primary data collection was done by the use of a self administered, structured questionnaire using the drop and pick method. The questionnaire was divided into four sections. Part A sought to collect general information data, part B collected data on the extent of supply chain leagility implementation and part C contained questions on supply chain leagility and performance and part D on the barriers of supply chain leagility implementation.

3.6 Data Analysis

After data collection, the filled in and returned questionnaires were edited for completeness, coded and entries made into a statistical package. This ensured that the data was accurate, consistent with other information, uniformly entered, complete and arranged to simplify coding and tabulation. The first objective was analyzed using descriptive statistics and for the second objective the following regression model was

employed to determine the relationship between supply chain leagility and performance of humanitarian organizations in Kenya.

$$P = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + e$$

Where P represented humanitarian supply chain performance; a was the constant; X1= waste elimination; X2= Cost; X3 =efficiency; X4= smooth operations; X5 is Flexibility; X6 is responsiveness; X7 is reliability and X8 is resilience b1 to b8 are the coefficients of the respective independent variables.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This section is a presentation of the findings from the primary data that was collected from respondents in organizations in the study sample. In order to check for accuracy, consistency and completeness, all questions were cross-checked for completeness, accuracy and consistency. The data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 22.0. In this section, the mean, standard deviation and regression are used for analysis.

4.2 Response Rate

The respondents of this research are supply chain professionals in humanitarian organizations who are experienced and greatly involved in managing supply chain operations. 30 out of 40 questionnaires were completed and returned by the respondents. This represents a 75% response rate which is considered a sufficient representation of the whole population.

4.3 General Information

This section seeks to gather general information from the sampled humanitarian organizations. This information includes the type of humanitarian organization, Mandate of the organization, duration of operation and funding of supply chain activities. Below are the results of the findings:

4.3.1 Type of Organization

The study seeks to determine the type of humanitarian organization in order to determine how many were local or international so as to examine the relationship between supply chain leagility and performance. Below are the findings of the study provided in Table 4.1:

Table 4.1 Type of Organization

	Frequency	Percent
Valid International	25	83
Local	5	17
Total	30	100

Source: Field Work (2014)

From the findings on Table 4.1, it is revealed that 83% of the humanitarian organizations are international, while 17% of the humanitarian organizations according to the respondents are local. This implies that most of the humanitarian organizations are international organizations.

4.3.2 Mandate in Humanitarian Aid

The researcher evaluated the mandate of the humanitarian organization to establish whether they are involved in relief, disaster response or what their mandate is. The results of the findings as provided in Table 4.2

Table 4.2 Mandate in Humanitarian Aid

	Frequency	Percent
Valid		
Relief	14	46
Disaster Response	8	27
other(Please Specify)	8	27
Total	30	100

Source: Field Work (2014)

According to the results on Table 4.2, it is observed that 46% of the humanitarian organizations are engaged in relief activities. However, there was tie of 27% between those humanitarian organizations that are mandated to carry out disaster response activities and other functions. This is a confirmation that most humanitarian organizations that engage in relief operations operate leagile supply chains to achieve efficiency and effectiveness in their operations.

4.3.3 Duration of Operation

The respondents were requested to indicate the duration the humanitarian organization has been in operation, to establish the extent to which these organizations have implemented supply chain leagility. Below are the results of the findings as presented on Table 4.3:

Table 4.3 Duration of Operation

	Frequency	Percent
Valid 10 Years and more	22	73
Valid 1-10 Years	8	27
Total	30	100

Source: Field Work (2014)

From the findings on Table 4.3, the results show that 73% of the humanitarian organizations have been in operation for a period of 10 years and more. While, according to the respondents 27% of the humanitarian organizations have been in operation between 1-10 years. This is an indication that most of the humanitarian organizations that are largely involved in implementation of supply chain leagility have adequate experience in handling relief and disaster operations efficiently.

4.3.4 Funding of Supply Chain Activities

The researcher has examined the extent to which humanitarian firms fund supply chain activities in Kenya with respect to relief and disaster response activities. The results of the findings as provided in the Table 4.4:

Table 4.4 Funding of Supply Chain Activities

	Frequency	Percent
Valid More than 50%	18	60
Valid Less than 50%	12	40
Total	30	100

Source: Field Work (2014)

The results show that 60% of the humanitarian organizations fund supply chain activities for disaster response and relief activities with more than 50% of their funding. According to the respondents, it has been confirmed that 40% use less than 50% of their funding in disaster response and relief activities. This implies that most humanitarian organizations fund their supply chain activities with more than 50% of their funding.

4.3 Extent of Supply Chain Leagility Implementation

The study has determined the extent to which humanitarian organizations have implemented supply chain leagility. Below are the results of the findings provided in Table 4.5 :

Table 4.5: Extent of Supply Chain Leagility Implementation

Extent of Supply Chain Leagility Implementation	N	Mean	S.D
We operate an efficient supply chain	30	4.83	.379
Costs are controlled along our supply chain	30	4.77	.430
Our IT infrastructure supports leagility	30	4.27	.450
Operations run smoothly	30	4.23	.430
We are able to deliver items on time and in sufficient amounts	30	4.00	.871
Our supply chain is able to react quickly and cost effectively	30	4.00	.871
Organization structure supports leagility	30	4.00	.871
Our staff are skilled in facilitating leagility	30	3.80	.407
It is incorporated into supply chain strategy	30	3.77	.728
We aim at locating facilities near aid recipients	30	3.77	.728
Our supply chain is adaptable to different situations	30	3.73	.691
Waste or loss of product is eliminated along our supply chain	30	3.73	.691
Our supply chain is integrated to facilitate leagility	30	3.63	.490
We are able to respond to disasters of different magnitudes	30	3.63	.490
Organizational culture supports leagility	30	3.13	.346

Source: Field Work (2014)

From the findings on Table 4.5, it is observed that Supply Chain Leagility is implemented to a large extent by humanitarian organizations in Kenya. The results are as follows; organizations operate efficient supply chains, costs are controlled along the supply chain, IT infrastructure supports leagility, operations run smoothly, achieved mean scores of 4.83, 4.77, 4.27 and 4.23. Further, the analysis has revealed that organizational culture does not support leagility with a mean score of 3.13 and a

standard deviation of .346. This is an indication that organization culture does not support supply chain leagility in humanitarian organizations. The results also reveal that most humanitarian organizations have a problem in responding to disasters of different magnitudes, supply chains are not fully integrated to support leagility, waste and loss of product is also not completely eliminated along these supply chains.

4.4 Supply Chain Leagility and Organizational Performance

To establish the relationship between the Supply Chain Leagility and Organizational Performance, the study has adopted a regression model. Below are the results of the findings:

4.4.1 Regression Analysis

This study tested the relationship between the Supply Chain Leagility and Organizational Performance using regression analysis.

4.4.2 Model Summary

The study has used the model summary to establish the coefficient of determination (R^2) and the correlation between the variables (R) in order to establish whether the model adopted was a good predictor in determining the relationship between the variables. Below are the results of the findings in table 4.6

Table 4.6 Model Summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788 ^a	.621	.545	.466

a. Predictors: (Constant), Resilience, Cost, Responsiveness, Eliminate Waste, Flexibility, Smooth Operations, Efficiency, Reliability

According to the results on Table 4.6, the coefficient of determination is 62%, this implies that the regression model used is a good predictor. Similarly, the correlation between the variables is $R=.788$ meaning that there is a positive correlation between Supply Chain Leagility and organizational performance in humanitarian organizations.

4.4.3 Analysis of Variance

The study has used analysis of variance to establish the impact of Supply Chain Leagility on organizational Performance. Results of the findings are indicated in Table 4.7:

Table 4.7 ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	3.115	8	.389	1.926	.010 ^b
Residual	4.252	21	.202		
Total	7.367	29			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Resilience, Responsiveness, Efficiency, Eliminate Waste, Cost, Flexibility, Smooth Operations, Reliability

From the results on Table 4.7, the p-value =0.01%. This means that the regression model is statistically significant in predicting the relationship between Supply Chain Leagility and organizational Performance since the level of significance is less than 5%.

4.4.4 Tests of Coefficients

The researcher conducted the statistical significance of the relationship between supply chain leagility and performance of humanitarian organizations in Kenya. The test of coefficients has been performed at 5% significance. Below are the results of the findings in Table 4.8:

Table 4.8 Test of Coefficients**Coefficients^a**

Model	Unstandardized		Standardized	T	Sig.
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	1.060	3.945		.269	.791
Eliminate Waste	.236	.126	.357	1.869	.046
Cost	.144	.138	.204	1.040	.010
Efficiency	.169	.235	.164	.717	.031
Smooth	.073	.147	.110	.498	.024
Operations					
Flexibility	.076	.171	.105	.446	.020
Responsiveness	.261	.159	.326	1.640	.016
Reliability	.200	.500	.150	.399	.034
Resilience	.465	.432	.397	1.075	.045

a. Dependent Variable: Organizational Performance

Source: Research Findings (2014)

Below is the regression model that was obtained from the results of the analysis

$$OP = 1.060 + .236X_1 + .144X_2 + .169X_3 + .073X_4 + .076X_5 + .261X_6 + .200X_7 + .465X_8$$

From the above regression model, there is a direct relationship between the independent variables; Eliminate waste, Cost, efficiency, Smooth operations, Flexibility, Responsiveness, Reliability, Resilience and organizational performance.

This implies that one unit increase in the independent variables results into a corresponding increase in organizational performance.

The above analysis is undertaken at 5% significance level. The criteria for comparing whether the predictor variables are significant in the model is done by comparing the corresponding probability which was obtained at $\alpha=0.05$. The probability values are less than 5% as follows: $p=0.046$, $p=0.010$, $p=0.031$, $p=0.024$, $p=0.02$, $p=0.016$, $p=0.034$, $p=0.045$. This means that predictor variable is significant. Therefore from the above analysis, all the predictor variables were statistically significant with p-values of less than 5%.

4.5 Challenges to Supply Chain Leagility Implementation

The study sought to determine the challenges in supply chain leagility implementation in humanitarian organizations in Kenya in the execution of their mandates. The findings are provided on Table 4.9:

Table 4.9 Challenges to Supply Chain Leagility Implementation

Challenges to Supply Chain Leagility Implementation	N	Mean	S.D
ICT systems are robust enough for the implementation of supply chain leagility	30	4.83	.379
Our staff are adequately trained and equipped to manage a leagile supply chain	30	4.77	.430
Data and information is shared within the organization	30	4.23	.430
Organization structure supports supply chain leagility	30	4.20	.714
Physical infrastructure impedes our implementation of a leagile supply chain	30	4.00	.871
High Level of collaboration with other humanitarian organizations	30	4.00	.871
Donors adequately fund our ICT needs	30	3.77	.728
Our ICS supports the implementation of a leagile supply chain	30	3.73	.691
High Level of collaboration with commercial supply chain partners	30	3.73	.691
Government policies and regulations support the implementation of a leagile supply chain	30	3.63	.490
Data and information is shared with external partners	30	3.63	.490
Policies and procedures support supply chain leagility	30	3.13	.346

Source: Field Work (2014)

According to the findings on Table 4.9, it is evident that the main challenges facing humanitarian organizations in Kenya is that there is lack of investment in ICT systems, employees are inadequately trained and equipped to properly manage agile supply chains. The other challenge is that information is not shared within humanitarian organizations, poor physical infrastructure, not collaborating with other humanitarian organizations, and organizational structures that do not support supply chain agility are some other challenges. These challenges attained mean scores of 4.83, 4.77, 4.23, 4.20 and 4.00 respectively.

Conversely, the least challenge that is faced by humanitarian organizations when carrying out their mandates is the implementation of policies and procedures that support supply chain agility. This challenge scored a mean of 3.13 with a standard deviation of .346. This implies that although most of the humanitarian organizations faced various challenges in implementation of supply chain agility, there was proper implementation of policies and procedure to support supply chain agility in humanitarian organizations.

4.6 Discussion

From the findings, it is observed that Supply Chain Agility is implemented to a large extent by humanitarian organizations in Kenya. These organizations operate efficient supply chains, costs are controlled along the supply chains, IT infrastructure supports agility and operations run smoothly in these humanitarian organizations. This is coherent with Lianza (2013) study which came to a conclusion that most of the international humanitarian organizations in East Africa have integrated their SCM

functions through adoption of modern technologies thus enabling more efficient and effective supply chains.

However, according to the results the greatest challenges for these organizations are; IT systems in these organizations are not robust enough, staff are not adequately trained, information is not shared within and outside the organization, poor physical infrastructure, organization structures that do not support leagility and not collaborating with other organizations. These findings are consistent with the study conducted by Kinyua (2013), who concluded that half of humanitarian organizations have non performing supply chains. This study puts more emphasis on the importance of investing in IT infrastructure to reduce costs and increase efficiency.

According to the findings most of these humanitarian organizations have ICT systems that are not robust enough to support supply chain leagility with a mean of 4.83. This is supported by the findings of Scholten et al. (2010) who came to a conclusion that the commercial concept of leagility when responding to disaster relief holds strong potential for increasing efficiency and effectiveness, but this application is restrained by the absence of supporting IT and the relegation of SCM to the back office.

The findings of this study are supported by those of Rahimnia and Moghadasian (2010) who came to a conclusion that hospitals need to be highly agile and can also benefit from lean strategies and that also leagility in professional services should emphasize the role that human resources play in operating more efficient and effective supply chains.

This study elucidates the role that supply chain leagility plays to create supply chains that respond to the diversity of demands of aid recipients. This is supported by the findings of Rahimnia et al. 2009 who in their study concluded that to respond to the changing demands of customers an organization can adopt new strategies to serve customers with short lead times, low costs and high variety.

CHAPTER FIVE

SUMMARY , CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This study has been carried out to establish the relationship between supply chain leagility and performance of humanitarian organizations in Kenya. The study has three objectives; to establish the extent to which supply chain leagility has been implemented by humanitarian organizations in Kenya, to determine the relationship between supply chain leagility and performance of humanitarian organizations in Kenya and to determine the challenges in the implementation of leagile supply chains by humanitarian organizations in Kenya. This chapter presents the summary of findings for the three objectives mentioned above, the conclusion and recommendations made based on findings and suggestions on areas that need to be researched on.

5.2 Summary of the Findings

The study has established that, supply chain personnel in humanitarian organizations are highly involved in implementation of supply chain leagility in humanitarian organizations in Kenya. The responses of the questionnaires that have been delivered and completed by the respondents are 30 out of 40. This represents 75% response which is considered a sufficient representation of the whole population.

According to the findings, it is revealed that 83% of the humanitarian organizations according to the respondents are international while 17% of the humanitarian organizations according to the respondents are local. This implies that most of the

humanitarian organizations are international. The results further reveal that 47% of humanitarian organizations are engaged in relief activities. However, there was tie between those humanitarian organizations that are mandated to carry out disaster response activities and other functions. This was represented by 27% of the respondents which is a confirmation that most humanitarian organizations implemented supply chain leagility in relief and disaster response activities to achieve efficiency and effectiveness in their operations.

According to the findings, 73% of the humanitarian organizations have been in operation for a period of 10 years and more. Only 8% of the humanitarian organizations have operated between 1-10 years. This is an indication that most of the humanitarian organizations that are largely involved in implementation of supply chain leagility have adequate experience in handling relief and disaster operations.

The findings discovered that 60% of the humanitarian organizations fund supply chain activities with more than 50% of their funding. According to the respondents 40% of the humanitarian organizations fund supply chain activities with less than 50% of their funding. This implies that most of the humanitarian organizations engaging in disaster and relief activities fund supply chain activities with more than 50% of their funds.

The results from descriptive statistics reveal that Supply Chain leagility was implemented to a large extent by the humanitarian organizations. The results establish that the organizations operate efficient supply chains, costs are controlled along these supply chains, IT infrastructure supports leagility, operations run smoothly in these

organizations and they are also able to react quickly and on time to supply chain demands.

The results further reveal that organizational culture does not support supply chain leagility, these organizations have a problem in responding to disasters of different magnitudes, supply chains are also not fully integrated to support supply chain leagility and waste and loss of product is not completely eliminated along these supply chains.

In trying to establish the relationship between supply chain leagility and organizational performance, the study adopted a regression model and the results of the regression analysis showed that the coefficient of determination is 62%, this implies that the regression model used is a good predictor. The correlation between the variables is $R=0.788$ meaning that there is a positive correlation between supply chain leagility and organizational performance.

The results from the analysis of variance establish that there is a significant difference between the two mean squares 0.389 and 0.202 resulting into a significance difference ($F=1.926$, $Sig.=0.010$). This means that the regression model is statistically significant in predicting the relationship between Supply Chain Leagility and organizational Performance since the level of significance is less than 5%. With reference to the tests of coefficients, it is further revealed that there is a direct relationship between the independent variables Eliminate waste, Cost, Efficiency, Smooth operations, Flexibility, Responsiveness, Reliability, Resilience and organizational performance.

With regard to the challenges facing humanitarian organizations in implementation of supply chain leagility, the main challenges facing humanitarian organizations are ; investing in ICT systems, inadequate training and equipping of employees to properly manage supply chain leagility, the other challenge is sharing of information within humanitarian organizations, restructuring organizations in to support supply chain leagility and poor physical infrastructure that impedes the implementation of leagile supply chains. These challenges negatively impact on the efficiency and effectiveness of humanitarian organizations in executing their mandates.

5.3 Conclusion

From the findings of the study it can be concluded that supply chain leagility has been implemented to a large extent by humanitarian organizations in Kenya. However, these organizations face a number of challenges in the implementation of supply chain leagility. There is a direct relationship between supply chain leagility and performance of humanitarian organizations in Kenya which is supported by the regression analysis.

5.4 Recommendations

There should be more investment in ICT infrastructure for robust systems that will facilitate leagile supply chains in humanitarian organizations. Donors should therefore give more funds for ICT systems to enhance efficiency and effectiveness of these organizations to improve organizational performance. Staff in humanitarian organizations should be adequately trained on implementation of leagile supply chains to enhance performance.

Information should be shared within organizations and with other organizations so as to facilitate supply chain leagility. Organizations should collaborate with other humanitarian organizations to enhance efficiency. Humanitarian organizations should also restructure to support supply chain leagility. Government and other stakeholders should be lobbied to improve physical and communication infrastructure which can enhance leagile supply chain activities.

5.4 Limitations of the Study

The researcher faced several limitations when conducting this study. One of the main limitations was getting responses on time from the respondents due to organizational polices and tight working schedules. The other limitation was that the researcher was restricted to collecting data from humanitarian organizations head offices rather than humanitarian aid sites.

5.5 Suggestions for Further Research

Future researchers and academicians should consider carrying out a comparative study on corporates that engage in humanitarian work, how their supply chains are configured, their efficiency and effectiveness, compared to those of humanitarian aid organizations.

Further research can be carried out on donors perspective on performance of humanitarian organizations. This will shed more light in making appropriate decisions on the humanitarian functions in relation to relief and disaster response.

It would also be useful for future researchers and academicians to conduct more research on supply chains in man-made disaster environments like terrorism sites. This will assist in designing more improved and efficient supply chains that can cope with evolving humanitarian challenges.

REFERENCES

- Aitken, J., Cristopher, M. & Towill, D. (2002). Understanding, Implementing and exploiting leagility and leanness. *International Journal of Logistics*, 5(1) 59-74
- Axelsen, L. A. (2013).The Issues Facing Modern Humanitarian Supply Chain. *Training to Go*. 1(1), 1-5
- Beamon, B.M, and Balcik, B. (2008).Performance Measurement in Humanitarian Relief Chains . *International Journal of Public Sector Management*.21(1), 4-25
- Beresford, A., Pettit S. and Knight ,D. (2012) Agility in Humanitarian Supply Chain, 2nd *International Humlog Workshop, Essen, September 2012*.
- Charles, A., Lauras, M. and Van Wassenhove, L. (2010).A model to define and assess the leagility of supply chains: Building on humanitarian experience. *International journal of physical distribution and logistics management*, 40 (8/9) 772-41
- Christopher, M (2010). Logistics and Supply Chain Management. *Prentice Hall 4th Edition*.
- Christopher,M. and Towill, D. R (2000). Supply Chain Migration from lean and functional to agile and customized". *Supply Chain Management: An International Journal*. 25
- Christopher, M. (2000) The Agile Supply Chain: Competing in Volatile Markets. *Industrial Marketing Management*. 29 (1) 37-44
- Fenton, G. (2003).Coordination in The Great Lakes. *Forced Migration Review*. 18,23-24

- Goldratt, E.M. (1990). *Theory of constraints: What is this thing called and how should it be implemented*. The North River, Press Croton on Hudson NY.
- Gunasekaran, A. Lai, K. and Cheng, E.T. (2008). Responsive supply chain: A competitive strategy in a networked economy. *International Journal of Management Science*. 36(549-564)
- Harrison, A. (1997). From Leanness to Leagility. *Manufacturing Engineer*, 76: 257-60.
- Ismaili, H. S. and Sharifi H. (2006). A Balanced Approach to Building Agile Supply Chains". *International Journal of Physical Distribution and Logistics Management*. 36: 431-444
- John, L. and Ramesh A. (2012). Humanitarian Supply Chain Management in India. *Journal of Advances in Management Research*.
- Katayama, H. and Bennet, D. (1999). Leagility adaptability leanness; a comparison of concepts and a study of practice. *International Journal of Production Economics*.
- Kinyua, K. (2013). Supply Chain Performance in Humanitarian Organizations in Kenya. *Project Research Presented to the University of Nairobi, School of Business*.
- Kothari, C. R. (2005). *Research methodology: Methods & techniques*. New Delhi: New Age International (P) Ltd.
- Krishnamurthy, R, and Yauch, C. (2007). Leagile Manufacturing a Proposed Corporate Infrastructure. *International Journal of Operations and Production Management*. 27 (6) 588-604
- Kumar, S.J., Rao N.K and Ramana, V.D. (2013). Evaluation of Performance metrics of leagile supply chain through Fuzzy MCDM". *Decision science letters*.

- Lijo J, and Ramesh, A (2012).Humanitarian Supply Chain Management in India”
Journal of Advances in Management Research, 9(2) 217-235
- Lisanza, S. Keller (2013).Supply Chain Management Integration and Performance of International Humanitarian Organizations in East Africa. *Project Research Presented to the University of Nairobi, School of Business.*
- Mason, R. M. and Towill R.D. (1999).Using The Information Decoupling Point To Improve Supply Chain Performance, *International Journal of Logistics Management. 10(2) 13-26*
- Mason, R., Naylor, J. B. and Towill, D. (2000). Lean, Agile or Leagile. Matching your supply chain to the marketplace. *International Journal of Production Research. 38(17) 4061-70*
- Mugenda, O. and Mugenda, A. (2003). *Research Methods: Quantitative and Qualitative Approaches*, Acts Press, Nairobi-Kenya.
- Naylor, J. B, Naim M.M., Berry. D, (1999). Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain”, *International Journal of Production Economics. 62(1/2) 107-18*
- Nyamu, K. Thomas (2012). Impact of Supply Chain Management Challenges on Humanitarian Organizations in Kenya. Project Research Presented to the University of Nairobi, School of Business.
- Oloruntoba, R., and Gray R.(2006). Humanitarian aid: an agile supply chain, *Supply Chain Management: An International Journal.11(2) 115-120*
- Oxfam (2009). *The Right to Survive*, Oxford: OXFAM
- Pavicic J., Alfirevic N. and Cacija N.L, (2014). Performance of Nonprofit Organizations: Empirical contrasts Between Privately and publicly funded Croatian Humanitarian organizations, *Economic Annals, volume LIX, No.200*

- Pettit, S. J. and Beresford A.K.C (2005). Emergency Relief Logistics. *International Journal of Physical Distribution and Logistics Management*.
- Poister, T. H. (2013) *Measuring Performance Public and Non-Profit Organization*. San Francisco: Jossey Bass.
- Rahimnia, F. and Moghadasian, M. (2010). Supply Chain Leagility in Professional Services, How to apply the decoupling point concept in healthcare delivery system. *Supply Chain Management, An International Journal*.15 (1) 80-91
- Ramalingham, B., Mitchell J., Borton J., Smart K (2010). Counting What Counts: Performance and Effectiveness in The Humanitarian Sector: *ANLAP Review of Humanitarian Action*
- Ramana, V. D., Rao N. K. and Kumar S. J. (2013) *Evaluation of Performance Metrics of Leagile Supply Chain through Fuzzy MCDM*: *Decision Science Letters*. 2: 211-222
- Reynolds, M., Maiens C. and Hoselkorn M. (2005) Challenges To Effective Information And Communication Systems In Humanitarian Relief Operations. *International Professional Communication Conference Proceedings*.
- Richard, P., Divines, T., Yip G. and Johnson, G. (2009), Measuring Organizational Performance: Towards Methodological Best Practice, *Journal of Management*, 35(3)
- Ritchie, W. J. and Kolodinsky, R. H. (2003). Non-Profit Organization Financial Performance Measurement: An Evaluation of New and Existing Financial Performance Measures. *Non- Profit Management and Leadership*. 13 (4) 367-381.

- Robertson, M. and Jones, C (1999) Application of Lean production and agile manufacturing concepts in a telecommunications environment. *International journal of Agile Management, systems*, 1(2):14-16
- Scholten, K., Scott P. S. and Fynes B (2010). Leagility in Humanitarian Aid Supply Chains. *Supply International Journal of Physical Distribution and Logistics Management*. 40: 8-9
- Sweeney, E. (2004). Lean and Agile Supply Chains: Jargon or Action. Logistics Solutions, *The Journal of the National Institute for Transport and Logistics*.7(1) 17- 19
- Therien J. P. and Lloyd, C. (2000). *Development Assistance on the Brink*. Third World Quartely. 21, 21-38
- Thomas A (2005). Humanitarian Logistics Enabling Disaster Responses. *Fritz Institute* 1: 1-5
- Thomas S. A. and Kopczak L. R. (2005).From Logistics to Supply Chain Management: *The Path Forward in the Humanitarian Sector*. Fritz Institute.
- UN (2006). Strengthening of the coordination of emergency humanitarian assistance of the united nation: <http://www.un.org>. Accessed 7/9/2014
- Van Hoek, R. I. (2001). The Rediscovery of Postponement: A Literature Review and Directions for Research, *Journal of Operations Management*: 1(2):1-5
- Van Wassenhove, N. (2006). Blackett Memorial Lecture. Humanitarian aid Logistics: Supply Chain Management in High Gear. *Journal of the Operational Research Society*.57:475-489
- Yamin S, Gunasekruan, & Mavondo, T (1999). Relationship between generic strategy, competitive advantage and firm performance: *an empirical analysis Technovation*: 19 (8) 507-18.

APPENDICES

APPENDIX I: QUESTIONNAIRE

Introduction

This research questionnaire is prepared to determine the relationship between supply chain leagility and performance of humanitarian organizations in Kenya. Your contribution is highly appreciated. All information gathered will be treated with utmost confidentiality.

Section A: General Information

1. Name of the organization? _____
2. Type of organization (Please tick as appropriate)
 - International
 - Local
3. Mandate in humanitarian aid(Tick as appropriate)
 - Disaster response
 - Relief
 - Other (please specify)
4. How long has your organization been in operation in Kenya?
 - 1-10 years
 - 10years and more
5. What percentage of your funding goes to supply chain activities?
 - Less than 50%
 - More than 50%

SECTION B: EXTENT OF SUPPLY CHAIN LELEAGILITY IMPLEMENTATION

Please indicate the extent to which you concur with the following statements concerning the relationship that exists between supply chain leleagility and extent of implementation in your organization. Using the following rating; 5 = to a very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small extent

		5	4	3	2	1
1.	It is incorporated into supply chain strategy					
2.	Organization structure supports leleagility					
3.	Organizational culture supports leleagility					
4.	Our supply chain is integrated to facilitate leleagility					
5.	Waste or loss of product is eliminated along our supply chain					
6.	Costs are controlled along our supply chain					
7.	We operate an efficient supply chain					
8.	Operations run smoothly					
9.	We are able to respond to disasters of different magnitudes					
10.	We are able to deliver items on time and in sufficient amounts					
11.	Our supply chain is able to react quickly and cost effectively					
12.	Our supply chain is adaptable to different situations					
13.	We aim at locating facilities near aid recipients					
14.	Our IT infrastructure supports leleagility					
15.	Our staff are skilled in facilitating leleagility					
16.	We collaborate with other humanitarian aid organizations					

Any other; (please specify)_____

SECTION C: SUPPLY CHAIN LELEAGILITY AND ORGANIZATIONAL PERFORMANCE

Please indicate the extent to which you concur with the following statements concerning the relationship that exists between supply chain leleagility and performance of your organization. Using the following rating; 5 = to a very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small extent

		5	4	3	2	1
1.	Minimizing waste or loss of product improves resource utilization					
2.	Controlling costs enhances utilization of financial resources					
3.	Efficiency has enabled us to better utilize resources, meet needs, save more lives and achieve time targets					
4.	We are able to capitalize on resources, meet needs, save lives and achieve time targets because our operations run smoothly.					
5.	Supply chain flexibility enables us to meet needs, save more lives, achieve time targets and improve the impact of our activities and projects					
6.	A responsive supply chain has assisted in meeting needs, saving lives, achieving time targets and enhanced the impact of projects and activities					
7.	Reliability of our supply chain has ensured that needs and time targets are met, more lives are saved and a better impact of our projects and activities.					

8.	A resilient or adaptable supply chain has enabled meeting of needs, saving of more lives, achievement of time targets and a better impact of projects and activities.					
9.	ICT systems enable us to have more timely responses					
10.	Data and information sharing within the organization enhances our performance					
11.	Data and information sharing with external partners enhances organizational performance					
12.	Collaboration with other humanitarian organization improves our performance					
13.	Collaboration with commercial supply chain partners enhances our performance					
14.	In general supply chain leaglity has enhanced performance of our organization					

Any other; (please specify)

SECTION D: CHALLENGES TO SUPPLY CHAIN LELEAGILITY

IMPLEMENTATION

Please indicate the barriers of supply chain leleagility implementation within your organization, rank by a tick in the appropriate box the nature and extent to which you consider these attributes significant using the following rating; 5 = to a very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small extent

		5	4	3	2	1
1.	Donors adequately fund our ICT needs					
2.	Organization structure supports supply chain leleagility					
3.	Policies and procedures support supply chain leleagility					
4.	Government policies and regulations support the implementation of a leagile supply chain					
5.	Our ICS supports the implementation of a leagile supply chain					
6.	Our staff are adequately trained and equipped to manage a leagile supply chain					
7.	ICT systems are robust enough for the implementation of supply chain leleagility					
8.	Data and information is shared within the organization					
9.	Data and information is shared with external partners					
10.	Physical infrastructure impedes our implementation of a leagile supply chain					
11.	Level of collaboration with other humanitarian organizations					
12.	Level of collaboration with commercial supply chain partners					

Any other; (please indicate)

Thank You for your cooperation

**APPENDIX II: LIST OF HUMANITARIAN ORGANISATIONS
FROM KENYA NGO COORDINATION BOARD**

1. Action Against Hunger
2. Action Aid
3. Adeso
4. Adventist Development and Relief Agency
5. African rescue Committee
6. Americares
7. Association for Aid and Relief (AAR) Japan
8. Care International
9. Caritas Switzerland
10. Catholic Relief Services
11. Centre for Health Solutions
12. Christian Aid
13. Concern Worldwide
14. Cooperazione Internazionale
15. Cordaid
16. Danchurchaid
17. Diakonie Emergency Aid
18. Diakonie Katastrophenhilfe
19. Finchurchaid
20. Food and Agriculture Organization
21. Food for The Hungry
22. German Agro Action
23. Goal Kenya

24. Hand in Hand Kenya
25. Help Age International
26. Hornaid
27. Intersos
28. International Rescue Committee
29. International Strategy for Disaster and Reduction in Africa
30. Islamic Relief worldwide
31. Kalonzo Musyoka Foundation
32. Kenya Red Cross Society
33. Lay Volunteers International Association
34. Lutheran World Relief
35. Medical Emergency Relief International
36. Mediciens Sans Frontiers-Belgium
37. Mediciens Sans Frontiers- France
38. Mediciens Sans Frontiers-Holland
39. Mediciens Sans Frontiers- Spain
40. Mediciens Sans Frontiers-Swiss
41. Mercy Corps
42. Mercy USA for Aid and Development
43. Methodist Relief and Development
44. Mubarak for Relief and Development
45. Muslim Aid
46. Northern Kenya Caucus
47. Norwegian Church Aid
48. Norwegian Refugee Council

49. Office for the Coordination of Humanitarian Affairs
50. Okoa Mtoto Initiative Kenya
51. Oxfam GB
52. Pastoralists Against Hunger
53. Plan International
54. RedR UK
55. Refugee Consortium of Kenya
56. Samaritans Purse
57. Save the Children
58. Solidarites International
59. Southern Aid
60. Tear Fund
61. Terre Des Hommes
62. Trocaire
63. United Nations Development Programme
64. United Nations High Commissioner for Refugees
65. World Cares Association
66. World Concern International
67. World food Programme
68. World health organization
69. World Relief International
70. World Vision

Source: NGO Coordination Board; Extracted 8th August 2014