LAST MILE LOGISTICS AND SERVICE DELIVERY IN DISASTER RESPONSE AMONG HUMANITARIAN ORGANIZATIONS IN KENYA

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D61/10438/2018

A Research Project Submitted In Partial Fulfilment of the Requirements for the Award of the Degree of Master of Business Administration, School Of Business, University of Nairobi

2020

DECLARATION

This research project is my original work and has not been submitted to any other university for academic award.

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This research project has been submitted with my approval as the appointed university supervisor.

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DEDICATION

I dedicate this project to my family who have being so supportive throughout the time I was doing my MBA. My children Angel and Ian for being so understanding when I was not able to give them personal attention. My dear James for encouragement and financial support during the entire program. May God richly bless

ACKNOWLEDGEMENTS

I wish to express my great gratitude to my supervisor Mr. Onserio Nyamwange for his constructive and valuable direction during the progress of this research work. His readiness to dedicate his valuable time is much cherished. I would also like to express my appreciation to Dr. Zipporah Kiruthi for moderating my research proposal work.

I do acknowledge the role played by my lecturers in procurement and supply chain management, for shaping the direction of this research. I do appreciate the encouragement given to me by my classmates and especially Christine Boore who constantly called to know my progress.

ABSTRACT

Response to disaster globally has been a challenge despite their upward trend. The study's general objective was to establish how the last mile logistics affect service delivery. The study's specific objectives were to determine the last mile logistic practices in disaster response among the humanitarian organizations in Kenya, and to determine the effects of last mile logistics on service delivery in humanitarian organizations in Kenya. The study was based on transactional cost theory and network theory. Cross-sectional research design was applied in the study on a population of 850 INGOs and 6500 NGOs operating in Kenya as at 30th June 2020. Stratified sampling was used to choose a sample of 99 humanitarian organizations that were a representation of the population. Primary data that was gathered using structured questionnaires addressed to the supply chain managers of the selected INGOs and NGOs was utilized in this study. The questionnaire was tested for validity and reliability before application in the study. Descriptive statistics and regression analysis were used to analyse the collected data. The study findings established that humanitarian organizations engaged in various last mile logistics practice including partnering with other organizations, outsourcing of key last mile logistics processes and adopting best practices. The last mile logistics services mostly outsourced include material handling services, warehouse management services, management of inventory, management of transportation and ordering of materials and services. While outsourcing these last mile logistics services, the humanitarian organizations considered various vendor factors which included financial strength, experience, range of services provided by the vendor, cost of the logistics services provided, reliability, security and safety, and convenience. The humanitarian organizations mostly partnered with government ministries, agencies or departments, donors, not for profit organizations, and private sector organizations. The study determined that last mile logistics had a significant positive effect on operational efficiency, reputation and timeliness in service provision by the humanitarian organizations in Kenya. The study concludes that the surveyed humanitarian organizations had attained operational efficiency, reputation, and timeliness in service provision. On the effect of last mile logistics on service delivery of humanitarian organizations, the study concludes that last mile logistics were essential for operational efficiency, reputation and timeliness in service provision by the humanitarian organizations in Kenya. The study made the following recommendations. First, the study recommends all parties in the last mile logistics supply chain to be engaged the planning stage to improve coordination. The study also recommends that humanitarian organizations should plan, communicate and orchestrate the supply chain at each node to benefit from cost savings and efficiency, particularly in regard to last mile delivery of humanitarian products and services.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Humans have been adversely affected by disasters from the prehistoric times. Man-made and natural disasters cause severe interference to a community, causing mass economic, social, environmental and financial losses beyond the community's powers and leaving mass casualties (Fisher, Hagon, Lattimer, O'Callaghan, Swithern, & Walmsley, 2018). Globally, disasters and emergencies have been increasing. According to Torani, Majd, Maroufi, Dowlati and Sheikhi (2019), this trend is as a result of various factors including population growth rate, continuous global warming, increased urbanization, residential densification, natural resources depletion and increase in conflicts (Fisher et al., 2018). However, despite this increase in disasters, responses to disasters remain a challenge. This is mostly due to lack of adequate disaster preparedness and underfunding (Bealt, Fernández, & Mansouri, 2016)

In Kenya, most disasters are initiated by environmental and hydro meteorological processes causing hazards such as drought and floods (Rono-Bett, 2018). Poor management of environmental and agricultural practices has increased the vulnerability of already fragile ecosystems. Moreover, man-made disasters such as acts of terrorism, conflicts, fires and civil unrest are also experienced (Mwinani, 2017). Despite the multi-sectoral mechanisms, systems and tools to guarantee timely response and disaster preparedness, Akali (2015) notes that the level of disaster preparedness in Kenya is still low. Rono (2017) reiterates the need to build capacity for disaster response and preparedness and promote disaster awareness culture in Kenya.

This study was anchored on network theory and transaction cost theory. The network theory assumes that organizational performance is dependent not just on efficiently it collaborates with its direct associates, but also on its collaboration with the associates of its partners (Haakansson, 1987). The transaction cost theory by North (1992), offers a conventional economic methodology to establish the organization's confines and applies efficiency as a main motivation that makes firms to enter into inter-firm logistic engagements. An organization can enhance its performance and decrease its total operational costs by collaborating with outside partners to provide logistical support (Halldorsson, Kotzab, Mikkola, & Skjøtt-Larsen, 2007).

The need to offer necessary and timely aid to disaster victims by utilizing an efficient humanitarian supply chain is a real challenge and last mile logistics play a strategic role (Coppola, 2015). Last mile logistics is the final receiving stage of relief supplies to the targeted beneficiaries who are the victims of disasters (Heaslip et al., 2018). This is the most critical stage and this is where most hurdles in logistics occur. Managing last last-mile humanitarian logistics entails making decisions regarding the operational details of the final links in the relief supply chain. The key differentiator between commercial logistics and humanitarian logistics is the 'last mile' which may entail use of unconventional transport mechanisms such as elephants, camels, donkeys and bicycles (Vega & Roussat, 2015). Last mile logistics also require an enhanced capacity of the logistic service provider to mobilize resources so that relief can reach the beneficiaries in a good condition and on time. Last mile logistics therefore, plays a vital role in the capacity of humanitarian organizations to provide relief services.

1.1.1 Last Mile Humanitarian Logistics

Last mile humanitarian logistics entails organization, control and execution of efficient procurement, warehousing and movement of information, goods as well as materials and services from origins to destinations, with the aim of meeting the needs of the beneficiaries affected by disasters (Thomas & Rock, 2005). Humanitarian logistics is a subset of logistics that focusses on planning, warehousing and delivery of supplies during emergencies or disasters to the affected communities. Bealt, Fernández and Mansouri (2016) note that last mile humanitarian logistics do not only focus on transportation of supplies to the affected communities, but it also encompasses information exchange, inventory management, resource optimization and forecasting.

There are various important aspects in humanitarian logistics which include communications, infrastructure, inventory management and transport (Agostinho, 2013). Last mile humanitarian logistics transpire in different time periods and phases to assist affected communities or areas after a disaster. The first phase, which is the definite disaster relief, involves responding immediately after a disaster (Ramalingam, Mitchell, Borton, & Smart, 2009). This period involves the preparations to react as fast and possible and respond to the occurrence of a disaster immediately it occurs. The second phase involves continuous relief efforts, like the restoration and improvement of a region, engaging affected persons in sustainable livelihoods or management of refugee camps (Coppola, 2015). In all these stages the objective is to ensure the affected persons resume their normal lives as fast as possible. Last mile humanitarian logistics therefore attempts to support disaster management and relief of the affected people, community or region.

1.1.2 Service Delivery in disaster situations

Humanitarian operations are aimed at providing services and support that meets the emergency needs of a population to sustainably reduce their vulnerability with minimal amount of resources at the shortest time possible (Bardhan & Dangi, 2016). The most vital activity during relief operations, after a disaster is to ensure and manage execution of all logistical activities efficiently to deliver the essential supplies to beneficiaries (Ramalingam et al., 2009). After a disaster, there are various individuals who need food and medical supplies. Service delivery by a humanitarian organization should be defined according to fundamental humanitarian principles and by its effects on the victims of disasters. Bardhan and Dangi (2016) argue that a more cohesive methodology to service delivery, relating different initiatives, functions and levels within the system, could enable firms surmount most of the perceived challenges of humanitarian efforts.

Toklu (2017) posits that the ability of a humanitarian organization to deliver services can be assessed using the extent of services delivered to disaster victims and the number of beneficiaries reached. Moreover, the extent of survivor satisfaction level and the satisfaction levels of the volunteers is critical in assessing service delivery by the humanitarian organization (Bealt et al., 2016). Key indicators include variety of services offered to victims, number of survivors saved during the critical period (the first 72 hours) efficiency of organization in reaching vulnerable populations and the timeliness of delivery of materials and supplies. Torabi, Aghabegloo and Meisami (2012) provide other indicators to be adequacy of aid materials (variety, number and quality), satisfaction

level of the organization's workers and volunteers and satisfaction rate of the donor organizations.

1.1.3 Humanitarian Organizations in Kenya

In Kenya, humanitarian organizations consist of women and youth groups, self-help groups, community-based organizations (CBOs), local nongovernmental organizations (NGOs), and International Non-Governmental Organizations (INGOs). Kenya is the base of operations for almost all donors and many international NGOs and UN agencies in East Africa (Council on Foundations, 2018). Most large INGOs serve as donors, leaving execution of programmes to local community-based organizations (CBOs) and NGOs. Since most NGOs, local or foreign, get large quantities of financing from external donors, their priorities and agendas affect CBO and NGO programs in substantial ways (Brunt & McCourt, 2015).

According to Council on Foundations (2018), there are over 220,000 humanitarian organizations that operate in a variety of sectors that include human rights, education, agriculture, children rights, water, disability, environment, small scale enterprises, poverty alleviation, gender and development, population, peace, counseling, training and health among others. These organizations also offer humanitarian aid in during disasters such as famines, fires, accidents such as collapsed buildings and dams, terrorist attacks and floods. The NGO Council in Kenya is mandated to provide overall governance to the NGO sector. It supports the key principles of good governance, accountability, transparency, probity and justice.

Humanitarian organizations engage in either relief or development activities (Bardhan & Dangi, 2016). Relief activities involve short-term provision of services and goods in emergency situations to alleviate suffering and minimize immediate risk to human survival and health after disasters (Brunt & McCourt, 2015). Disasters in Kenya have included fires, drought, floods, landslides, terrorist attacks, political clashes and traffic accidents. Humanitarian organizations provide supplies, shelter, medicine and water to disaster victims (Toklu, 2017). Humanitarian organizations are also engaged in development activities. These activities involve engaging in long-term initiatives that enhance community sustainability and self-sufficiency. Development activities comprise of creating reliable and permanent transportation networks, food sources, healthcare facilities and housing (Mwinani, 2017). This study will be conducted on humanitarian organizations that focus on relief activities.

1.2 Research Problem

Last mile logistics is the last phase of transport of a service or product to the final client or target beneficiary (Bealt et al., 2016). It entails organizing, control and execution of efficient storage, packaging and movement of materials, information, goods and services from origin to consumption destination. This is done with the sole aim of meeting beneficiaries' needs (Agostinho, 2013). Last mile logistics do not only focus on the movement of goods to their destinations, but it also encompasses inventory management, resource optimization, forecasting and information exchange (Bealt et al., 2016). There are various important aspects in last mile logistics which include communications,

infrastructure, inventory management and transport (Agostinho, 2013). If any of these aspects is not managed effectively, the products or services will not reach the targeted recipients on time (Coppola, 2015).

According to Brunt and McCourt (2015), common disasters that Kenya experiences are caused by environmental hydro meteorological processes that initiate catastrophes such as drought and floods. The ecosystems in the country are left fragile and vulnerable through poor management of environmental and agricultural practices. Furthermore, the hazards are exacerbated by climate change, which has increased their scale of impact and variability. Besides, the country experiences frequent human initiated disasters such as industrial accidents, fires, civil unrest, terrorism, conflicts, collapsed buildings and road accidents. However, despite the increasing likelihood of disasters in Kenya, service delivery and response by humanitarian organizations is always wanting. Humanitarian organizations in Kenya usually respond to disasters late and with limited human and material resources (Akali, 2015).

The role played by last mile logistics in service delivery by humanitarian organizations has been explored by various researchers. Heaslip et al. (2018) assessed the role of logistics in cash-based humanitarian response during disasters. The study found that logistics play a critical role in humanitarian transportation, assessment, procurement, distribution and pre-positioning. Therefore, humanitarian logistics significantly enhance service delivery and cost reduction for humanitarian aid delivery. Another study by Vega and Roussat (2015) assessed the influence of humanitarian logistics on efficiency of

humanitarian organizations in providing aid. The study established that LSPs contribute significantly towards humanitarian logistics by resource provision, design sharing, intelligence sharing, accomplishing logistics operations and coordinating and managing relief supply chain in partnership with humanitarian organizations. Agostinho (2013) assessed the role of humanitarian logistics in enabling NGOs to reach more people. The study established that although humanitarian organizations have developed their own supply chains, they still have a shortage of tools and resources required to empower them to distribute aid more efficiently.

There are few studies on the local context on the role of logistics on humanitarian organizations' service delivery. For instance, Magadi and Shale (2018) examined the effect of humanitarian logistics on performance of the supply chain in Kenyan NGOs. Further, Munovi (2015) assessed the influence of outsourcing of logistics on performance of humanitarian organizations in Kenya while Munguti (2013) assessed the influence of supply chain management on the response by international NGOs in Kenya towards disasters. None of these studies focused on the influence of last mile logistics on service delivery in humanitarian organizations. The purpose of this study was to bridge this knowledge gap by providing answers to the questions; what are the last mile logistic practices of the humanitarian organizations in Kenya? And what are the effects of last mile logistics on service delivery in humanitarian organizations in Kenya?

1.3 Research Objectives

The study's general objective was to establish how the last mile logistics affect service

delivery.

The study's specific objectives were;

1. To determine the last mile logistic practices in disaster response among the humanitarian organizations in Kenya
2. To determine the effects of last mile logistics on service delivery in humanitarian organizations in Kenya.

1.4 Value of the Study

This study is justified on the grounds that logistics accounts for between 60% and 80% of emergency program costs (Vega & Roussat, 2015). Over the years 'humanitarian logistics' has become a recognized term and an essential service in disaster response. With limited resources, logisticians must understand their role in enabling humanitarian organizations to provide effective service. The research will explore the last mile logistics problems that may affect service delivery by humanitarian organizations. The findings from this study will be significant to policy makers, logistic and supply chain practitioners and experts, scholars, and future researchers.

Policy makers such as directorate of special programs in the Ministry of Devolution and Planning and the NGO coordination board might use the findings to come up with policies that will streamline logistics in disaster response operations. These policy makers will understand the logistical issues that humanitarian organizations face during disaster response and hence could have policies to intervene.

The experts and practitioners in logistics and supply chains will understand the key logistical factors for humanitarian organizations and hence could devise effective policies and strategies to enhance them. Moreover, managers in these humanitarian organizations could use these findings to devise interventions to respond to the vital logistical aspects hat will be established in this study.

The study will also be valuable to academia. The study findings will indicate the vital logistical aspects for service delivery in humanitarian organizations. This will add to the existing literature on the contribution of logistics in emergency response by humanitarian organizations. The study will also provide recommendations for further research which future researchers could investigate.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The review of literature which comprises the empirical and theoretical literature is presented in this chapter. Theoretical review consists of a discussion of the theories (transaction cost theory and network theory) that were applied as a basis of the study. The empirical review includes studies on last mile logistics in humanitarian organizations, indicators of service delivery in humanitarian organizations and the influence of last mile logistics on service delivery in humanitarian organizations.

2.2 Theoretical Review

This section presents the two theories applied in the study which explains last mile logistics and the influence of logistics on service delivery in humanitarian organizations. The two theories are transaction cost theory and network theory.

2.2.1 Transaction Cost Theory

The transaction cost theory by North (1992), offers a conventional economic methodology to establish the organization's confines and applies efficiency as a main motivation that makes firms to enter into inter-firm logistic engagements. An organization can enhance its performance and decrease its total operational costs by collaborating with outside partners to provide logistical support (Halldorssonet al., 2007). Transaction costs are the main determinant whether firm undertakings will be inbound. With high transaction costs, it is appropriate to make the transactions internal. On the contrary, with low transaction costs, it is advisable to purchase the services or goods in

the market (Zylbersztajn, 2018). A three-dimensional framework was formulated to characterize transactions. These dimensions are frequency, uncertainty, and specificity. These dimensions determine how organizations plan their last mile logistics.

Putting emphasis on the benefits of capabilities, most scholars have opined that organizations tend to internalize those last mile logistic activities they can carry out with excellent capabilities compared to the external providers (Akbar & Tracogna, 2018). According to Peng and Associates (2016), humanitarian organizations would engage external providers of logistics services on those activities that the organization lacks enough capabilities or those activities that external providers could deliver at a reduced cost than if the firm performs the activities itself. This indicates that the capabilities of the outsourced firms may affect service delivery in humanitarian organization. On the contrary, the humanitarian organizations will carry out some last mile logistics that they feel they have the capabilities.

2.2.2 Network Theory

Network theory indicates that relationships among companies in the supply chain pools the resources form the different firms in the chain to accomplish more through collective efforts than through their separate efforts (Haakansson, 1987). According to Oliver (1990), network theory champions inter-organizational associations by underscoring the prominence of special associations between different firms, the improvement of trust through constructive long-lasting accommodating associations and reciprocal adaptation of systems and routines through interchange processes.

Network theory focuses mainly on connectivity, network density and transaction costs in the network (Schermann et al., 2016). A network with high connectivity and density usually has low transaction cost and vice versa. This theory will be used in the study to assess how last mile logistic practices are influenced by the connectivity, density and transaction costs in the last mile logistic network (Schermann et al., 2016). Transaction cost can be related to the ease of a last mile logistic network forming connections to serve humanitarian organizations (Emmert-Streib et al., 2017). When transaction cost is high, the connections are few (Huggins & Thomson, 2015).

By reducing the cost of transactions, a huge impact on the last mile logistic network can be felt (Lin, 2017). Moreover, globalization in a last mile logistic network tends to reduce average path length by increasing connectivity (Sedita & Apa, 2016). It brings last mile logistic partners closer and gives them the greater sense of interconnectedness. Additionally, connectivity changes the functioning of the last mile logistic system, and interferes with the way of management and designing these systems (Grandia & Meehan, 2017). According to Sedita and Apa (2015), the connectivity between the humanitarian organization and last mile logistic services providers can enhance the response time of the logistics providers and the humanitarian organization in responses to a disaster.

2.3 Last Mile Humanitarian Logistics

Humanitarian logistics are the aspects of acquisition, movement and delivery of food and relief materials and supplies, when disaster strikes. It is also the process of planning, controlling and execution of an efficient storage and movement of information, products

and services from the producers to victims during a disaster, in order to help those in need. Some of the aspects of humanitarian last mile logistics are extent of centralization, inventory management, communication, infrastructure and transport (Tofighi, Tomari &Mansouri, 2016). Centralization is the extent that formal authority regarding last mile logistics is concentrated in the top echelon of the firm. Decentralization entails having much of the decision-making authority at the lower levels of the company's hierarchy, and thereby providing personnel at lower levels of management with more power and responsibility to implement and make decisions relating to logistics.

Transport is a key aspect in ensuring humanitarian services are delivered to intended recipients. In humanitarian logistics, it is essential to define the viability of different types of transportation. Cost, earnestness, and geographical features of disaster-stricken zones form the basis of evaluation of transport (Tatham & Christopher, 2018). Humanitarian organizations apply strategic outsourcing in order to enhance operational costs and effectiveness. While determining the most suitable mode of transport, some factors must be considered. Nature of the supplies is one of the factors. Different goods need different temperatures and handling techniques. For instance, hazardous materials must be transported differently from consumable goods. Another factor is the weight and volume of the supplies. This factor determines number of vehicles to be used and the mode of transportation needed.

Destination and the how urgently the materials are needed are also some of the crucial factors to be considered. Destination means the distance of the good to the point of

delivery. Goods delivery most of the time is faced by obstacles such as bad weather, poor roads, and geographical factors. Transport mode is also chosen depending on how urgently the material is needed. In emergency situations, faster modes such as air should be taken (Gammelgaard, 2015). Lastly, it is always important to consider whether alternative methods, routes and means are available. Pros and cons of all these should be evaluated before choosing the most valid one.

Another key aspect in last mile logistics is logistic outsourcing. This the strategic use of external organizations to accomplish activities customarily accomplished by internal departments, resources and staff (Falagara Sigala & Wolkabinger, 2019). A humanitarian organization must effectively decide which logistics service to provide in-house and which ones to outsource to outside parties, based on benefits, risks and costs. Besides, partnership is another important last mile logistic practice that enables the humanitarian organization to have strategic logistic relationships with government or other not-for-profit organizations.

Human resource is also one of the logistics aspects of humanitarian organizations. Humanitarian organizations tend to outsource most of its staff. This process is important as it enhances formulation of HR strategies and principles, employees sourcing and selection, managing and leading employees, formulating incentives and rewarding initiatives, managing payroll and benefit and retirement programs administration (Kunz et al., 2017). End to end employee outsourcing prototype entails strategic processes like employee acquisition tasks, such as, recruitment, induction, and pre-employment testing.

These and many more factors enable the organization to enhance strategic measures and leverage employees.

There are varied models used in outsourcing human resource. Blecken suggested three models which are; HR Navigator, Administrative Service Outsourcing (ASO) and Professional Employer Organization (PEO). These models meet any organizational needs regardless of its size. HR expertise is also necessary in protecting and dealing with everything related to human resource, as the company grows. Outsourcing as stated by Falagara Sigala and Wakolbinger (2019), is a good way of enabling the company concentrate on factors that affect their processes, and hence improve their performance.

Storage too is a logistic aspect in humanitarian organizations. It is essential to come up with logistics of storage as it is important in planning a disaster response. Warehouses should be designed in such a way that contamination and waste of materials is minimized (Kunz et al., 2017). Authorities in charge too should work towards maximization of responsiveness, and minimizing total cost, number of distribution stations, and time of distribution. Storage process is aimed at keeping emergency materials safe till their time of delivery to the recipients.

There are different types of warehouses. One of them is general deliver warehouses in which products stay for long or at least till they are moved to secondary houses or relief areas. Slow rotation warehouses are a type of storage warehouse for reserve stocks that are not on high demand for example, spare parts. A quick rotation warehouse on the other

hand is a storage warehouse for quickly moving materials (Gammelgaard e al., 2015). Quick rotation warehouses are always situated near or in disaster prone areas. Lastly, are temporary collection sites which act as a storage for goods until a suitable storage is found.

Lastly is the inventory management that includes materials and service ordering. Inventory prepositioning enhances responsiveness of humanitarian organizations. The technique is used in determining number of items needed as per specific safety stock levels, as well as frequency of orders. It can also be used to search suitable warehouse locations through facility location (Falagara Sigala & Wolkabinger, 2019). According to logistics, inventory planning can be categorized into four. These categories are periodic review model, news vendor model, base stock model, and dynamic lot-size model. Every model has its pros and cons and this should be considered in determining which model best fits the situation.

2.4 Service Delivery in Humanitarian Organizations

Service delivery can be defined as the interaction among clients and service providers, where clients can either benefit or not benefit from the services they are provided. Excellent service delivery increases the value victims get after a disaster strikes. The timeliness of response, operational efficiency and the reputation of the humanitarian organization in both coverage and items delivered are the two measures of service delivery (Onyango, 2016). Service delivery can also be defined as an intangible type of economy, which can neither be stored nor owned.

Humanitarian organizations can improve their service delivery through enhancing cooperation in the service supply chain, and its outcome might be enhancement of productivity and service delivery. In humanitarian organizations, service delivery is gauged by determining response time as it is a crucial service delivery aspect. First, factors such as location of the supplier, transport preference, politics, security and delivery strategies are considered. Secondly, flexibility is used to evaluate the capability of any given organization to react to different magnitude and the speed of response to tragedies. How many lives are saved is also another factor, quantity of supply staff and qualification is also another factor (Baborikar & Shengata, 2018). Lastly how the organization utilizes its resources (operational efficiency) is also another factor of determining the service delivery as it helps in determining the exact needs of an organization.

There are also principles that humanitarian organizations are committed to in their service delivery. One of the principles is its reputation towards humanity. Humanitarian organizations always try to solve human suffering. This principle ensures the organizations preserve lives, and grant respect to human life. Neutrality is also another principle. Humanitarian organizations avoid favoritism at all costs and observe equality and equity in their dealings (Raysaback-Smith, 2015). Racial practices, political fanatism, religious bias and ideological nature is never part of humanitarian organizations. Lastly, is independence, organizations are self-governing. They do not depend on the military or political governance of that area to run their operations or to deliver services.

Another role of logistic providers is actively taking part in humanitarian activities. They take part in the decision-making process. Their decision-making aims at day to day management of operations. They do not only engage themselves in transport and storage (Von Shreeb, 2018). They also have the capability of reinforcing the efficiency of humanitarian emergency response. They also give a hand to the national government in making decisions regarding disaster management.

2.5 Empirical Review and Knowledge Gap

The main task of last mile logistics to service delivery is the acquiring and delivering of goods and services requested, to specific places at the time of need, while at the same time guaranteeing best value for money. Immediately after the effects of a disaster are felt, basic survival needs for example, water, food, medication and shelter are provided (Kunz et al., 2017). There is however, very little information on literature concerning logistics service delivery which justifies this study.

Juhász and Bányai (2018) noted that last mile service providers take part in humanitarian process for commercial or benevolent purposes. One of their contributions to humanitarian organizations is working hand in hand with these organizations popularly known as partnership. By doing so, the stakeholders needs will be satisfied, as well as have their public image improved. They can also act as customers in cases where their services are outsourced. Human relief organizations in most cases lack enough resources for their operations and thus are forced to outsource. This study was however, conducted

outside Kenya and hence its findings may not be generalizable to the country.

Logistic providers also act as facilitators by improving the functions of humanitarian organizations. They facilitate and customize products and services for the target recipients. Logistics providers assist humanitarian organizations in responding more swiftly towards specific response needs as well as providing ‘add on’ services on top of normal services. Ahmadi, Seifi and Tootooni (2015), indicated that third party logistic services are incorporated, for instance, ranging from packaging, inventory control to final delivery to target recipients. Through cross docking, they are also able to do away with undesired inventories hence, improving response services of humanitarian organizations.

The application of information technology permits organizations to increase coordination and communication of innumerable value adding activities with their associates and between utilities within their own set-ups. Additionally, progression of the internet technology system offers substantial opportunities for cost reduction, increasing response, increased flexibility and improving response services (Lu, Goh & De Souza, 2018). Information organization is vital in disaster control and the speed with which it is used can have serious effect on the usefulness of the response. It helps in incorporating activities and also providing statistics to sanction humanitarian supply chain to run more efficiently. The habit of using information system to track and trace relief matters can expressively increase efficiency of aid delivery and reduce waste.

Kunz et al. (2017) indicated that logistic costs for materials and supplies comprise of

approximately 80% of relief costs. Some scholars concur with this postulation by noting that logistic costs were the most significant solitary element for many humanitarian organizations. Besides, Baporikar and Shangheta (2018) posit that with the growing number of disasters, humanitarian organizations require cost effective and versatile logistic processes to link disaster beneficiaries and donors.

2.6 Conceptual Framework

Figure 2.1 provides the conceptual framework that the study was anchored on. Last mile logistics are the independent variables while service delivery by humanitarian organizations is the dependent variable. The hypothesized association is provided.

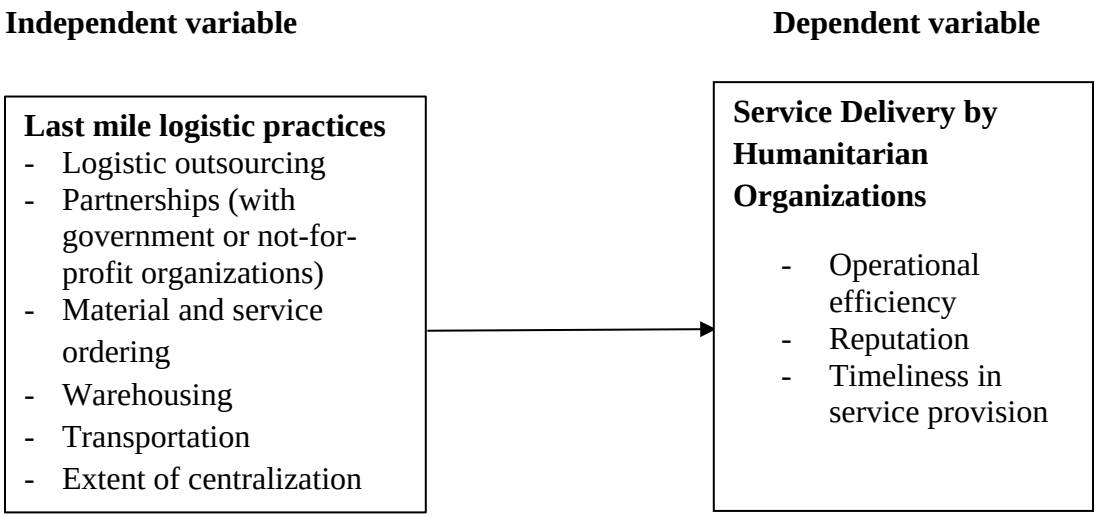

Figure 2.1: Conceptual Framework

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

The study's methodology is provided and discussed in this chapter. Provided in the chapter are the methods, instruments, processes and techniques that were adopted. Besides, the chapter provides the research design, study population, sampling technique and the sample size. Besides, the chapter provides the methods applied in data collection, the instruments for data collection and the process followed in data analysis.

3.2 Research Design

The study applied a cross-sectional research design that allowed for the examination of the operational indicators of service delivery in a humanitarian organization and establish the effects of last mile logistics on service delivery in humanitarian organizations in Kenya. The design was applied on a cross section of INGOs and NGOs operating in Kenya. Fisher (2017) observed that a cross sectional research design is an organization of methods for gathering data on attitudes, behavior, thoughts and characteristics by obtaining responses from research participants through a form with prepared questions.

Saunders, Lewis and Thornhill (2015) also indicated that a survey is an investigative process applied to gather information using a greatly structured tool. Since this study intended to collect information form managers in NGOs and INGOs, this approach was appropriate for this study.

3.3 Population of the study.

The study population was 850 INGOs and 6500 NGOs operating in Kenya as at 30th June 2020 (NGO Coordination Board, 2020). These are NGOs that provide various humanitarian services during disasters or as part of their regular activities. Table 3.1 provides the study population.

Table 3.1: Study Population

Target organizations	Population	Percent
NGOs	6500	88
INGOs	850	12
Total	**7350**	**100**

Source; Researcher 2020

3.4 Sample Design

Stratified sampling technique was applied to choose a sample that was representative of the study population. This ensured that a representative number of INGOs and NGOs was selected. Zikmund, Babin, Carr and Griffin (2013) indicate that stratified sampling is suitable when the population consists of distinct sub groups. The sample selected was calculated using the formula indicated hereunder.

In the formula:

n = Target sample size

N = Study population (7350)

e = Level of significance (10%)

Applying the formula led to selection of a sample of 99. The sampling from each group is

as indicated in Table 3.2.

Table 3.2: Sample Size

Target organizations	Population	Sample
NGOs	6500	87
INGOs	850	12
Total	**7350**	**99**

Source; Researcher 2020

3.5 Data Collection

The study made use of primary data that was gathered using structured questionnaires to the selected INGOs and NGOs was utilized in this study. The targeted respondent in each organization was the supply chain manager. The questionnaire, designed after a review of literature on last mile logistics and service delivery by humanitarian organizations, was self-administered. The questionnaire had four parts. The first section gathered general information on the organization and the respondents. The second part collected data on last mile logistics used by the humanitarian organizations. The third section sought information on indicators of service delivery. The last part had questions on the service delivery by the humanitarian organization. Questions on section A, B and C were structured on a five-point Likert scale.

The research questionnaire was pre-tested for content reliability and validity. Sample for the pilot testing was randomly selected from the NGOs and INGOs. Ten respondents (10% of the targeted sample) were selected to participate in the pilot testing. Validity means that the questionnaires are measuring what they are expected to measure. The

researcher relied on experts to determine face validity of the questionnaire. Content validity according to Bell (2015) assesses whether an instrument gauges what it was designed to gauge. Content validity of the questionnaire was determined by the comments and results of the pretest. Items that fail the validity test will be dropped or modified as appropriate. Collis and Hussey (2013) observe that an instrument is regarded as reliable if it is accurate and dependably produces similar results when administered repeatedly. Cronbach's alpha was applied to assess reliability. The results are provided in Table 3.3.

Table 3.3: Questionnaire Reliability Results

Constructs	Number of items	Alpha
Last mile logistic services' outsourcing considerations	10	0.881
Last mile logistic partnerships	9	0.816
Last mile logistic practices	13	0.893
Service delivery	3	0.725

The study results presented in Table 3.3 show that all the constructs satisfied the reliability test as all the Cronbach's alpha values were above 0.7. The constructs on last mile logistics practices had the highest reliability (a = 0.893) while constructs on service delivery had a lower reliability (a = 0.725) though all were above 0.7, and hence considered reliable.

3.6 Data Analysis

The data analysis process began with organization of the questionnaires to determine the

ones correctly filled that will be considered for analysis. After categorization, raw data was coded into Statistical package for social sciences (SPSS) which was applied in generating the essential statistics. Regression analysis and descriptive statistics were used to analyze the gathered data. Descriptive statistics was applied on the closed questions and were used to establish extent and types of last mile logistics use by humanitarian organizations and the indicators of service delivery. Descriptive statistics used included mean scores, frequency distributions and percentages. Regression analysis was used to establish the influence of last mile logistics on service delivery by humanitarian organizations. The regression models were of the form;

$$Y_1 = ß_0 + ß_1X + e$$

$$Y_2 = ß_0 + ß_2X + e$$

$$Y_3 = ß_0 + ß_3X + e$$

In the regression models, 'Y_1' represents operational efficiency in disaster response among humanitarian organizations, 'Y_2' represents reputation in disaster response among humanitarian organizations, 'Y_3' represents timeliness in service provision in disaster response among humanitarian organizations, 'X' represents last mile logistics, '$ß_0$' is the constant and 'e' is the error term. The study results were presented using bar graphs, pie charts and tables. The summary of the data gathered and analysis method is provided in Table 3.4.

Table 3.4: Summary of Data Collected and Analysis Method

Objective	Questions	Data analysis method
Background Information	Section A	Descriptive statistics – Frequencies and percentages
To establish the last mile logistic practices in disaster response among the humanitarian organizations in Kenya	Section B	Descriptive statistics – means, standard deviations, percentages and frequencies
To establish extent of service delivery in disaster response among humanitarian organizations in Kenya.	Section C	Descriptive statistics – means, standard deviations, percentages and frequencies
To establish the effects of last mile logistics on service delivery in humanitarian organizations in Kenya	Section B and C	Regression analysis Inferential statistics

CHAPTER FOUR: DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This analysis of the collected data, the study results and the discussion of the results are presented in this chapter. The analysis of the data is conducted based on the proposed analysis techniques that includes descriptive (means, standard deviations, percentages, and frequencies) and inferential (regression) analysis methods. The presentation of the results is hence provided in tables and figures. Lastly, the discussion of the findings is provided relative to the empirical and theoretical literature.

4.2 Response Rate

The study targeted 99 supply chain managers in 99 NGOs and INGOs in Kenya. These were targeted to respond to the study questionnaire. The study managed to issue questionnaires and receive responses from 68 respondents. The rate of response was 68.7%. Based on the specification by Zikmund et al. (2013) that a response rate of above 60% is adequate for surveys whose results can be published in reputable journals, this response rate was considered acceptable.

4.3 Demographic Characteristics

This section provides the results regarding the general and demographic features of the study participants and their organizations. The study enquired on the scope of the organization (whether local or international). The findings are provided in Figure 4.1

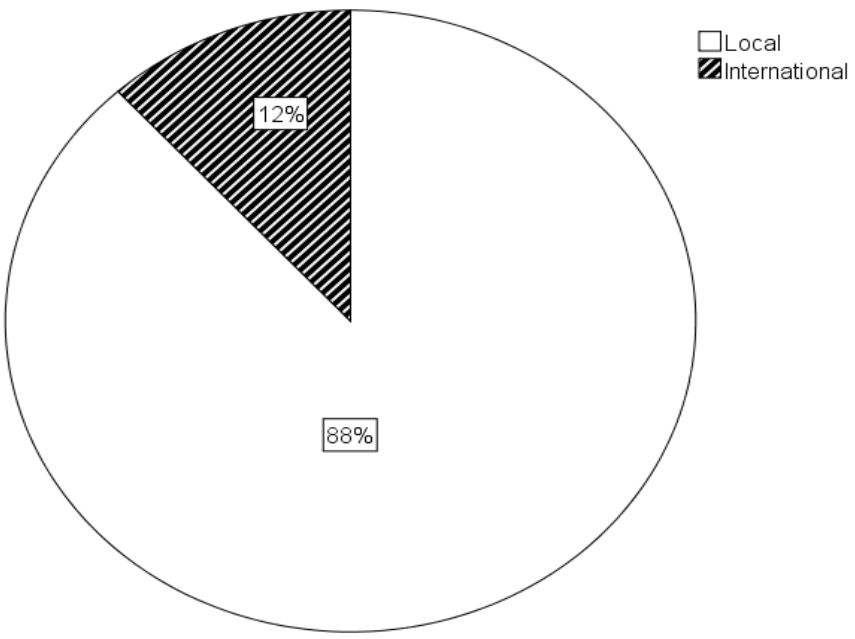

Figure 4.1: Geographical Focus of the Organization

The study results provided in Figure 4.1 show that NGOs with a local focus were 88% while those with an international presence were 12%. This was representative of the targeted population and hence the findings presented herein are expected to be representative of the NGOs in Kenya.

The study also investigated the service focus of the organizations that participated in the study. The study enquired whether the organization focused mostly on relief or disaster response. Study findings are provided in Figure 4.2.

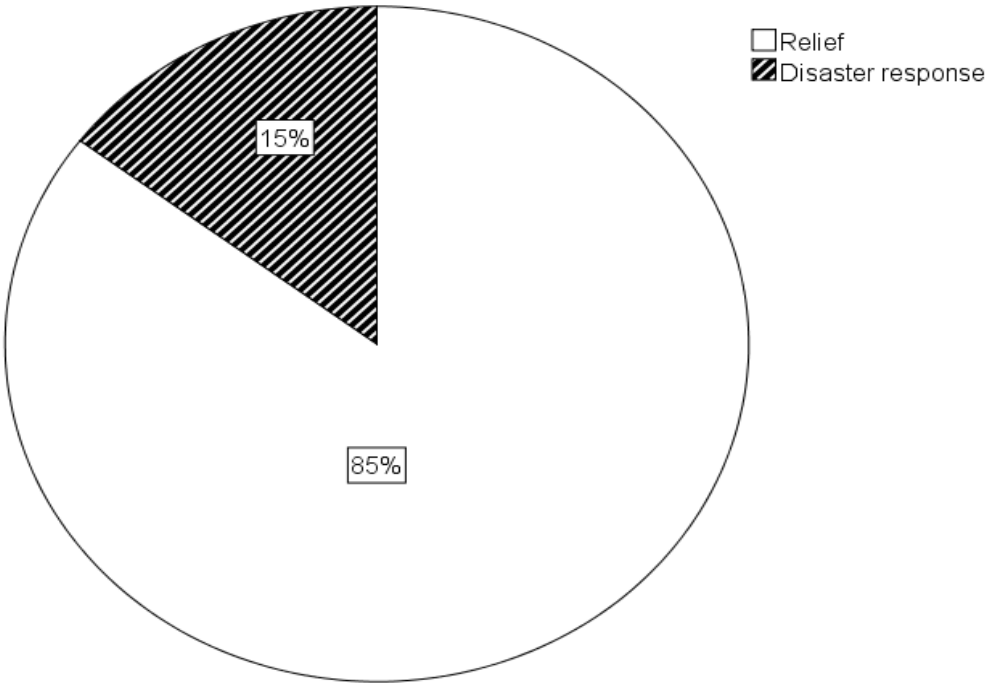

Figure 4.2: Service Focus of the Organization

The results presented in Figure 4.2 show that most of the organizations were focussed on relief (85%) while only 15% were mostly focussed on disaster response. This aligns with the disaster prevalence in the country which has experienced low prevalence of disasters. This makes the existing NGOs to focus much on relief but still have capacity for disaster response.

The study investigated the time period in years that the targeted NGOs had been operating in the country. The study findings are provided in Figure 4.3.

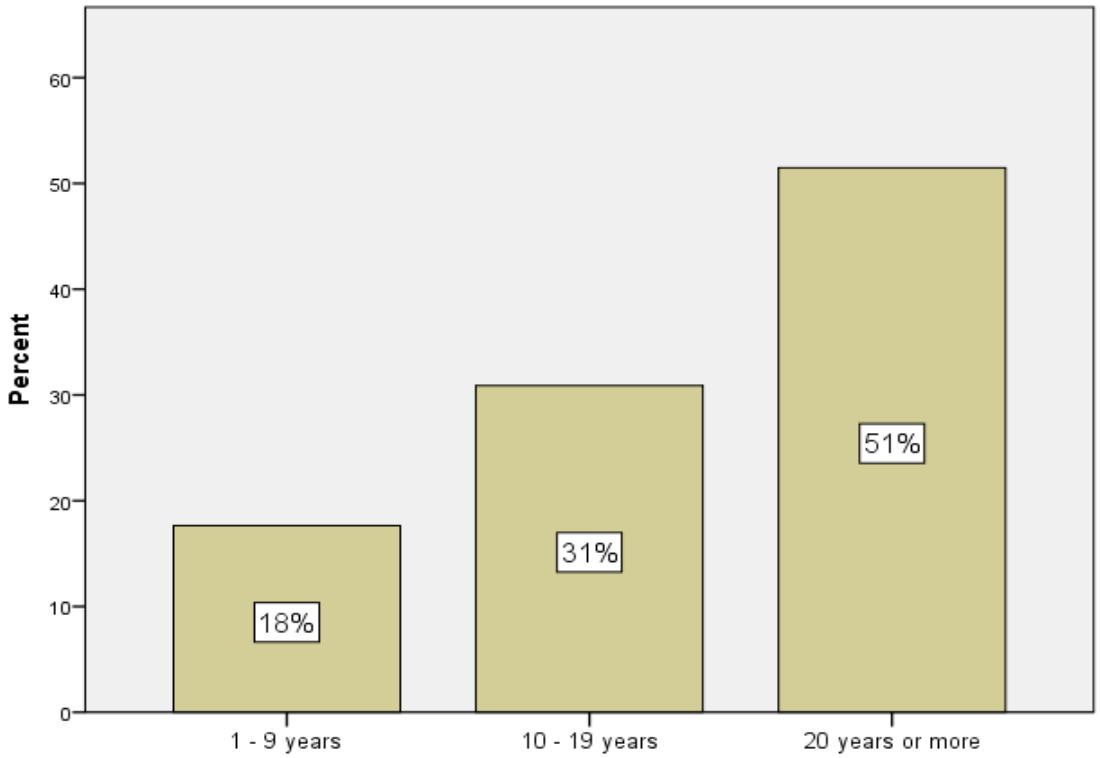

Figure 4.3: Number of Years in Operation

The study results provided in Figure 4.3 show that most of the organizations had been in operation in the country for over 20 years (51%). Besides, 31% of the organizations had operated in the country for between 10 and 19 years while only 18% had operated in the country for less than 10 years. These findings imply that the organizations targeted had vast experience on relief and disaster response in the country.

The study enquired on the time period in years that the respondents had served in their organizations. The findings are provided in Figure 4.4.

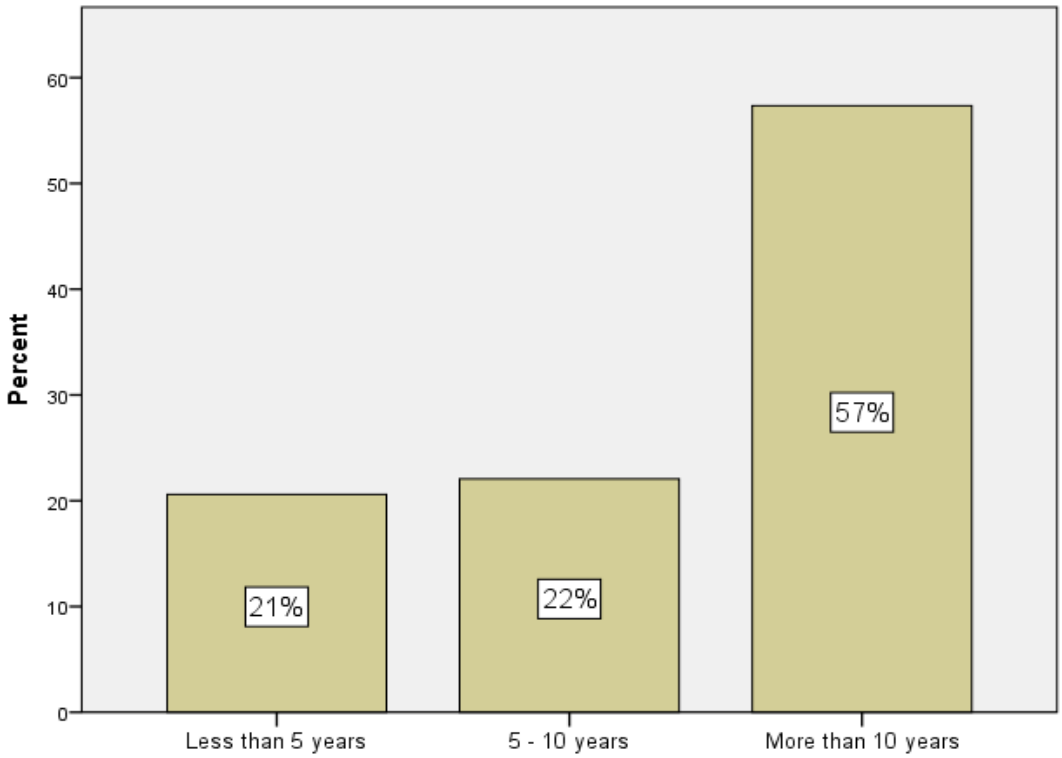

Figure 4.4: Number of Years in the Organization

Study findings provided in Figure 4.4 indicate that most of the study participants (57%) had worked in their organizations for more than 10 years. Those who had worked in the organizations for between 5 and 10 years were 22% while 21% had worked in their organizations for below five years. These study results indicate that the study participants had experience on supply chain and hence could provide critical and reliable information about last mile logistics and service delivery in the organizations.

The study investigated the amount of the organizations' funds are taken by logistics. The findings are provided in Figure 4.5.

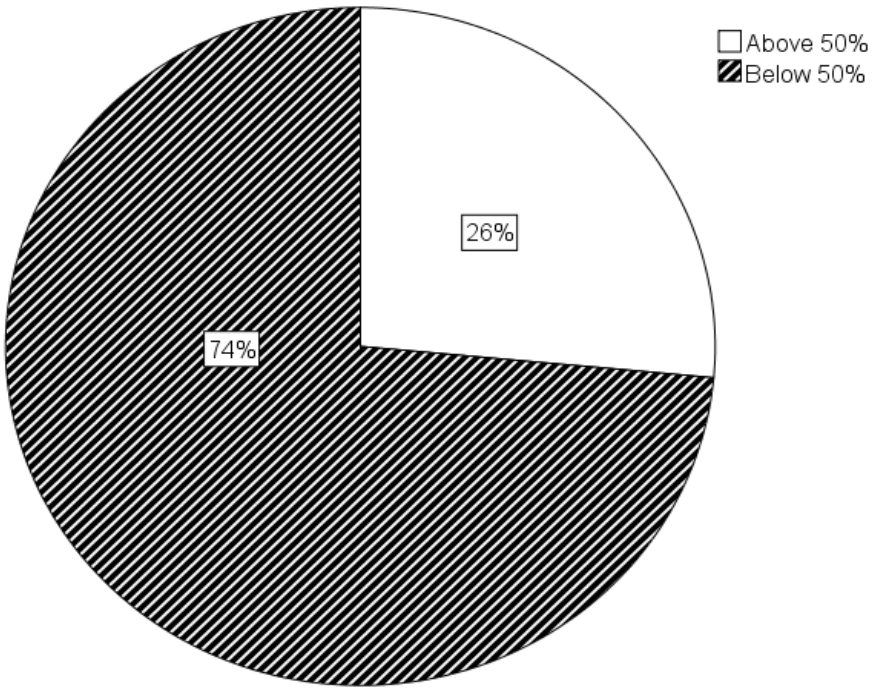

Figure 4.5: Percentage of the Organization Funds Taken by Logistics

The study results provided in Figure 4.5 determined that for 74% of the humanitarian organizations, logistics takes up less than 50% of the organization's funds while 26% of the humanitarian organizations indicated that logistics takes up more than 50% of their funds.

4.4 Last Mile Logistics Practices

The study sought to establish the last mile logistics processes, practices, considerations and partnerships that the humanitarian organizations engage in. First, the study sought to establish whether last mile logistics in the humanitarian organizations are outsourced or conducted in-house. The study findings are provided in Figure 4.6.

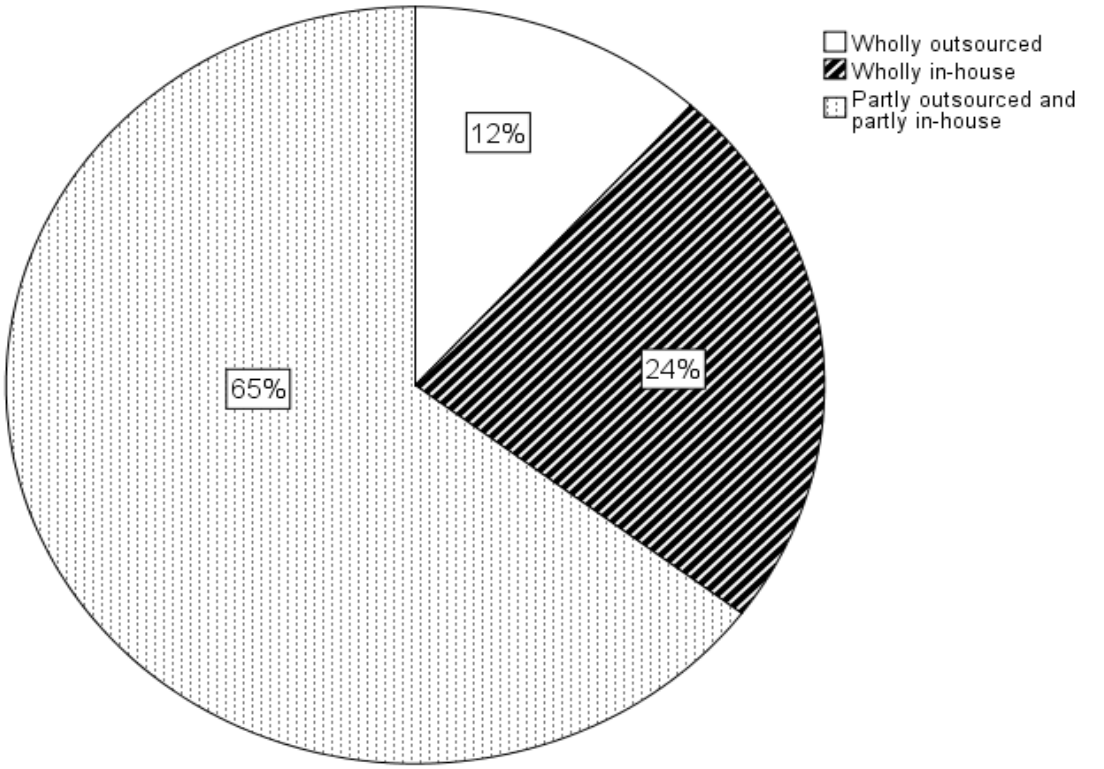

Figure 4.6: Logistics Outsourcing in the Organizations

The study results presented in Figure 4.6 show that 65% of the humanitarian organizations partly outsourced their logistics services and partly conducted them in-house. Those that wholly outsourced their last mile logistics were 12% while 24% wholly conducted their last mile logistics in-house.

4.4.1 Outsourcing of Last Mile Logistics

The study sought to determine the last mile logistic services that are outsourced by the humanitarian organizations. A list of last mile logistics services were provided to the study participants and they were required to indicate whether their indicate whether their

organizations outsourced or not. The study findings are provided in Table 4.1.

Table 4.1: Last Mile Logistic Services Outsourced

Last mile logistic services	**Yes**		**No**	
	F	**%**	**F**	**%**
Ordering of materials and services	49	72	19	28
Hiring of third-party service providers for logistics	41	60	27	40
Material handling services	56	82	12	18
Warehousing management services	56	82	12	18
Management of information flow	25	37	43	63
Management of inventory	54	79	14	21
Management of transportation	51	75	17	25

The findings presented in Table 4.1 show that material handling services (82%), warehouse management services (82%), management of inventory (79%), management of transportation (75%) and ordering of materials and services (72%) were the most outsourced services by the humanitarian organizations. The findings also determined that management of information flow was the least outsourced last mile logistic services (37%).

4.4.2 Factors Considered While Outsourcing of Last Mile Logistics Services

The study investigated the factors considered by the humanitarian organizations when outsourcing last mile logistic services. Various factors were provided and study participants were required to indicate the extent that those factors were considered in their organizations. The rating was on a five-point Likert scale, that assessed the extent that the organization considered the listed factors in selecting the last mile logistic service

provider. The rating was on a scale of 1 to 5 (Very low Extent - Very great extent). The study applied means sores and standard deviations to analyze the responses and the findings are provided in Table 4.2.

Table 4.2: Factors Considered While Outsourcing of Last Mile Logistics Services

Factor	Mean	Std. Deviation
Experience	4.35	.799
Convenience	4.06	.896
Cost of logistic services provided	4.29	.963
Financial strength	4.46	.502
Reliability / Dependability	4.28	.770
Flexibility in operations	3.44	1.410
Security and safety	4.13	1.064
Range of services	4.33	1.183
Geographical presence	3.16	1.141
Management expertise	3.28	.978

The study results provided in Table 4.2 indicate that to a great extent, humanitarian organizations considered financial strength (mean = 4.46, std deviation = 0.502), experience (mean = 4.35, std deviation = 0.799), range of services (mean = 4.33, std deviation = 1.183), cost of logistics services provided (mean = 4.29, std deviation = 0.963), reliability (mean = 4.28, std deviation = 0.770), security and safety (mean = 4.13, std deviation = 1.064) and convenience (mean = 4.06, std deviation = 0.896). The factors considered by the humanitarian organizations to a moderate extent while outsourcing last mile logistics services included flexibility in operations (mean = 3.44, std deviation = 1.410), management expertise (mean = 3.28, std deviation = 0.978) and geographical presence (mean = 3.16, std deviation = 1.141).

4.4.3 Partnerships in Last Mile Logistics

The study investigated the extent that the humanitarian organizations partnered with the various organizations to provide last mile logistic services. Study participants were provided with different partners and were required to rate the extent their organizations partnered with those partners on a scale of 1 to 5 (Very low Extent to Very great extent). Analysis was through means and standard deviations. The study findings are provided in Table 4.3.

Table 4.3: Partnerships in Last Mile Logistic Services

Partners	Mean	Std. Deviation
Government ministries, agencies or departments	4.16	1.016
Military	1.99	1.086
Police	2.34	.840
Donors	4.10	.964
Not for profit organizations (e.g. church)	3.79	1.153
Private sector organizations	3.79	.955
Aid agencies	3.91	.707
Private individuals	2.18	1.036

The study established that in last mile logistics, the humanitarian organizations partnered with government ministries, agencies or departments (mean = 4.16, std deviation = 1.016), donors (mean = 4.10, std deviation = 0.964), not for profit organizations (e.g. church) (mean = 3.79, std deviation = 1.153) and private sector organizations (mean = 3.79, std deviation = 0.955) to a great extent. The humanitarian organizations partners with police (mean = 2.34, std deviation = 0.840), private individuals (mean = 2.18, std deviation = 1.036), and the military (mean = 1.99, std deviation = 1.086) to a low extent.

4.4.4 Last Mile Logistics Practices

The last mile logistics practices adopted by the humanitarian organizations were investigated. Several practices were listed and the study participants were required to indicate the extent that their organizations adopted those practices. The rating used was on a scale of 1 to 5 (Very low extent to Very great extent). Analysis of the responses was though means and standard deviations and the study findings are provided in Table 4.4.

Table 4.4: Last Mile Logistic Practices by Humanitarian Organizations

Practices	Mean	Std. Deviation
Before seeking any logistic service, the organization conducts a needs assessment to establish whether it will serve the purpose	4.31	.605
The organization conducts logistic needs assessment for every disaster separately instead of have assessment for multi-sectoral needs	4.33	.690
Service and material ordering is conducted after analysis of supply and demand	3.91	.728
The organization has some humanitarian aid substances in its warehouses (e.g. food, blankets, tents, medicine) for rapid response during emergencies	2.29	.918
In case of emergencies, orders are placed rapidly and fast tracked by the organization	4.42	.929
The organization has a partnership with suppliers of materials and services to cater for rapid response during emergencies	3.91	.805
The organization uses logistic companies that provide subsidized and diverse transportation services	4.29	.793
The organization has strategically located warehouses that facilitate storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims	2.38	.939
The storage facilities used by the organization are well designed to prevent contamination, waste or spoilage of store materials and supplies	4.12	.923
The organization records and documents all materials and services received at its distribution centres and warehouses	4.51	.738
The organization has invested heavily in technology to track and enhance movement of materials, services and supplies to victims during disasters	3.88	.939

The organization uses different transport modes (road or air) to ensure that materials, supplies and services reach the victims as fast as possible	4.10	.964
Various transport optimization models are applied by the organization to ensure that materials, services and supplies reach the victims at the least cost possible	3.91	.876

The study findings (Table 4.4) indicate that the humanitarian organizations adopted most of the listed last mile logistic practices to a very great or great extent. Recording and documenting all materials and services received at the distribution centres and warehouses was practiced to a very great extent by the humanitarian organizations (mean = 4.51, std deviation = 0.738). The last mile logistic practices adopted to a great extent were placing orders rapidly and fast tracking them in case of emergencies (mean = 4.42, std deviation = 0.929), conducting logistic needs assessment for each disaster individually as opposed to multi-sectoral needs assessment (mean = 4.33, std deviation = 0.690), conducting needs assessment before seeking any logistic service to establish whether it will serve the purpose (mean = 4.31, std deviation = 0.738) and using logistic companies that provide subsidized and diverse transportation services (mean = 4.29, std deviation = 0.793).

Study results provided in Table 4.4 show that there were some last mile logistics practices adopted to a low extent. These included having strategically located warehouses that facilitate storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims (mean = 2.38, std deviation = 0.939), and having some humanitarian aid substances in the organization's warehouses (e.g. food, blankets, tents, medicine) for rapid response during emergencies (mean = 2.29, std deviation = 0.918). These findings

indicate that the humanitarian organizations rarely have their own warehouses and they rarely keep inventory of supplies on hand.

The study examined whether there were any differences in last mile logistics practices between local and International NGOs. This was assessed using analysis of variance (ANOVA). The study findings are provided in Table 4.5.

Table 4.5: Differences in Last Mile Logistics between Local and International NGOs

Last mile logistic practice		Sum of Squares	df	Mean Square	F	Sig.
Before seeking any logistic service, the organization conducts a needs assessment to establish whether it will serve the purpose	Between Groups	.040	1	.040	.107	.745
	Within Groups	24.475	66	.371		
	Total	24.515	67			
The organization conducts logistic needs assessment for each disaster separately instead of having assessments for multi-sectoral needs	Between Groups	3.708	1	3.708	8.664	.016
	Within Groups	28.233	66	.428		
	Total	31.941	67			
Material and service ordering is conducted after analysis of supply and demand	Between Groups	.012	1	.012	.023	.880
	Within Groups	35.458	66	.537		
	Total	35.471	67			
The organization has some humanitarian aid substances in its warehouses (e.g. food, blankets, tents, medicine) for rapid response during emergencies	Between Groups	.412	1	.412	.485	.488
	Within Groups	56.058	66	.849		
	Total	56.471	67			
In case of emergencies, orders are placed rapidly and fast tracked by the organization	Between Groups	.949	1	.949	1.100	.298
	Within Groups	56.933	66	.863		
	Total	57.882	67			
The organization has a partnership with suppliers of materials and services to cater for rapid response during emergencies	Between Groups	5.412	1	5.412	9.385	.009
	Within Groups	38.059	66	.577		
	Total	43.471	67			
The organization uses logistic companies that provide subsidized and diverse transportation services	Between Groups	.018	1	.018	.028	.868
	Within Groups	42.100	66	.638		
	Total	42.118	67			
The organization has strategically located warehouses that facilitate storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims	Between Groups	7.534	1	7.534	9.647	.007
	Within Groups	51.525	66	.781		
	Total	59.059	67			
The storage facilities used by the organization are well designed to prevent contamination, waste or spoilage	Between Groups	.159	1	.159	.184	.619
	Within Groups	56.900	66	.862		
	Total	57.059	67			

of store materials and supplies	Total	57.059	67			
The organization records and documents all materials and services received at its distribution centres and warehouses	Between Groups	.031	1	.031	.057	.812
	Within Groups	36.483	66	.553		
	Total	36.515	67			
The organization has invested heavily in technology to track and enhance movement of materials, services and supplies to victims during disasters	Between Groups	8.534	1	8.534	11.141	.004
	Within Groups	50.525	66	.766		
	Total	59.059	67			
The organization uses different transport modes (road or air) to ensure that materials, supplies and services reach the victims as fast as possible	Between Groups	9.196	1	9.196	11.434	.002
	Within Groups	53.083	66	.804		
	Total	62.279	67			
Various transport optimization models are applied by the organization to ensure that materials, services and supplies reach the victims at the least cost possible	Between Groups	1.037	1	1.037	1.357	.248
	Within Groups	50.433	66	.764		
	Total	51.471	67			

The results provided in Table 4.5 indicate that there were significant differences between local and international NGOs on assessment of logistic needs assessment for each disaster separately instead of having assessments for multi-sectoral needs (F =8.664, p = 0.016) and having partnership with suppliers of materials and services to cater for rapid response during emergencies (F = 9.385, p = 0.009). There were also differences in possession of strategically located warehouses that facilitated storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims (F = 9.647, p = 0.007) and also on heavy investment in technology to track and enhance movement of materials, services and supplies to victims during disasters (F = 11.141, p = 0.004). Moreover, the study findings showed that there were significant differences between the local and international NGOs in the use of different transport modes (road or air) to ensure that materials, supplies and services reach the victims as fast as possible (F = 11.434, p = 0.002).

The study further sought to examine the differences in adopted last mile logistic practices based on the time period in years that the NGOs had been operational. The ANOVA was applied and the findings are provided in Table 4.6.

Table 4.6: Differences in Last Mile Logistics Based on NGOs' Years of Operation

Last mile logistic practice		Sum of Squares	df	Mean Square	F	Sig.
Before seeking any logistic service, the organization conducts a needs assessment to establish whether it will serve the purpose	Between Groups	.353	2	.176	.475	.624
	Within Groups	24.162	65	.372		
	Total	24.515	67			
The organization conducts logistic needs assessment for each disaster separately instead of having assessments for multi-sectoral needs	Between Groups	12.179	2	6.090	20.031	.000
	Within Groups	19.762	65	.304		
	Total	31.941	67			
Material and service ordering is conducted after analysis of supply and demand	Between Groups	2.632	2	1.316	2.605	.082
	Within Groups	32.838	65	.505		
	Total	35.471	67			
The organization has some humanitarian aid substances in its warehouses (e.g. food, blankets, tents, medicine) for rapid response during emergencies	Between Groups	4.202	2	2.101	2.612	.081
	Within Groups	52.269	65	.804		
	Total	56.471	67			
In case of emergencies, orders are placed rapidly and fast tracked by the organization	Between Groups	.930	2	.465	.531	.591
	Within Groups	56.952	65	.876		
	Total	57.882	67			
The organization has a partnership with suppliers of materials and services to cater for rapid response during emergencies	Between Groups	2.630	2	1.315	2.093	.132
	Within Groups	40.840	65	.628		
	Total	43.471	67			
The organization uses logistic companies that provide subsidized and diverse transportation services	Between Groups	.099	2	.049	.076	.927
	Within Groups	42.019	65	.646		
	Total	42.118	67			
The organization has strategically located warehouses that facilitate storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims	Between Groups	11.114	2	5.557	7.530	.017
	Within Groups	47.945	65	.738		
	Total	59.059	67			
The storage facilities used by the organization are well designed to prevent contamination, waste or spoilage of store materials and supplies	Between Groups	4.161	2	2.081	2.557	.085
	Within Groups	52.898	65	.814		
	Total	57.059	67			
The organization records and documents all materials and services received at its distribution centres and warehouses	Between Groups	.153	2	.076	.137	.873
	Within Groups	36.362	65	.559		
	Total	36.515	67			
The organization has invested heavily in technology to track and enhance movement of	Between Groups	11.458	2	5.729	7.872	.015
	Within Groups	47.305	65	.728		
	Total	58.763	67			

materials, services and supplies to victims during disasters						
The organization uses different transport modes (road or air) to ensure that materials, supplies and services reach the victims as fast as possible	Between Groups	13.953	2	6.977	9.390	.006
	Within Groups	48.326	65	.743		
	Total	62.279	67			
Various transport optimization models are applied by the organization to ensure that materials, services and supplies reach the victims at the least cost possible	Between Groups	1.252	2	.626	.810	.449
	Within Groups	50.219	65	.773		
	Total	51.471	67			

The study results provided in Table 4.6 indicate that there were significant differences regarding how the NGOs assessed logistic needs for each disaster separately instead of having assessments for multi-sectoral needs ($F = 20.031$, $p < 0.05$). Besides, based on their years of operation, the NGOs had significant differences regarding having strategically located warehouses that facilitate storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims ($F = 7.53$, $p = 0.017$), their investment in technology to track and enhance movement of materials, services and supplies to victims during disasters ($F = 7.872$, $p = 0.015$) and use of different transport modes (road or air) to ensure that materials, supplies and services reach the victims as fast as possible ($F = 9.39$, $p = 0.006$).

4.4.5 Service Delivery

The study had service delivery by humanitarian organizations as the dependent variable. The study therefore, sought to assess the service delivery levels of the humanitarian organizations that participated in the study. Service delivery was assessed using three aspects; operational efficiency, reputation and timeliness in service provision. Study participants were required to the extent that the organization had achieved the service delivery aspects on a scale of 1 to 5 (Very low Extent to Very great extent). Mean scores

and standard deviations were applied in analyzing the responses. Table 4.7 provides the study results.

Table 4.7: Service Delivery among Humanitarian Organizations

Service delivery aspect	Mean	Std. Deviation
Operational efficiency – Costs in response and disaster relief as reduced	3.99	.702
Reputation - The organization has a reputation as a fast responder in cases of disasters and humanitarian situations	4.00	.829
Timeliness in service provision - The organization has consistently achieved timely delivery of material support and services to disaster victims	3.98	.589

Results provided in Table 4.7 show that the surveyed humanitarian organizations had attained operational efficiency (mean = 3.99, std deviation = 0.702), reputation (mean = 4.00, std deviation = 0.829), and timeliness in service provision (mean = 3.98, std deviation = 0.589) to a great extent. These study results indicate that the surveyed organization had attained high levels of service delivery as indicated by their reputation, timeliness and efficiency.

4.5 Effect of Last Mile Logistics on Service Delivery of Humanitarian Organizations

The study had an aim of determining the influence of last mile logistics on service delivery in humanitarian organizations in Kenya. To attain this objective, the study applied simple linear regression. Collis and Hussey (2013) indicate that simple linear regression allows the estimation of how a dependent variable varies based on the variance in the independent variable. This can hence indicate whether the independent variable has a significant effect on the dependent variable. The study fitted three simple linear regression model of last mile logistics against the three indicators of service delivery

(operational efficiency, reputation and timeliness in service provision). The ratings on the last mile logistic practices were summed for this purpose. The findings are provided in this section.

Table 4.8 presents study results on the effect of last mile logistics on operational efficiency.

Table 4.8: Effects of Last Mile Logistics on Operational Efficiency

R	R Square	Adjusted R Square	Std. Error of the Estimate
.955	.913	.912	.246

	Sum of Squares	df	Mean Square	F	Sig.
Regression	41.992	1	41.992	691.477	.000
Residual	4.008	66	.061		
Total	46.000	67			

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	.462	.138		3.353	.001
Last mile logistics	.875	.033	.955	26.296	.000

The model from the analysis in Table 4.8 is;

$Y_1 = .462 + .875X$

Where Y_1 is operational efficiency of humanitarian organizations and X is last mile logistic practices.

The results provided in Table 4.8 show that last mile logistics explained 91.3% of the operational efficiency of humanitarian organizations in Kenya (r squared = 0.913). This indicates that there was 8.7% of operational efficiency which was described by other aspects that were not considered in the model. these findings indicate that the model had a high explanatory power. Besides, the results indicate that the model was statistically significant ($F = 691.477$, $p < 0.05$). These results indicate that the model was a good fit.

Moreover, the results of the t test indicate that last mile logistics had a statistically significant effect on operational efficiency of humanitarian organizations in Kenya (ß = 0.875, t = 26.296, p < 0.05). These results show that improvement of last mile logistics practices by one unit would lead to improvement in operational efficiency by 0.875.

The results of the effect of last mile logistics on reputation of the humanitarian organizations towards disaster response are presented in Table 4.9.

Table 4.9: Effects of Last Mile Logistics on Reputation

R	R Square	Adjusted R Square	Std. Error of the Estimate
.717	.514	.506	.582

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	23.627	1	23.627	69.697	.000
Residual	22.373	66	.339		
Total	46.000	67			

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.641	.291		5.634	.000
Last mile logistics	.622	.074	.717	8.348	.000

The model from the analysis in Table 4.9 is;

$Y_2 = 1.641 + .622X$

Where Y_2 reputation of the humanitarian organizations towards disaster response and X is last mile logistic practices.

The results presented in Table 4.9 indicate that last mile logistics explained 51.4% of the reputation of humanitarian organizations in Kenya towards disaster response and relief (r squared = 0.514). This indicates that there was 48.6% of reputation of the humanitarian organizations which was explicated by other aspects that were not included in the model.

These study findings indicate that the model had a moderate explanatory power. Besides, the results indicate that the model was statistically significant ($F = 69.697$, $p < 0.05$). These findings show that the model was a good fit. Moreover, the results of the t test indicate that last mile logistics had a statistically significant effect on reputation of humanitarian organizations in Kenya towards relief and disaster response ($ß = 0.622$, $t = 8.348$, $p < 0.05$). These results show that improvement of last mile logistics practices by one unit would lead to improvement in reputation of the humanitarian organizations by 0.622.

The results on the effect of last mile logistic practices on timeliness in service delivery by the humanitarian organizations are provided in Table 4.10.

Table 4.10: Effects of Last Mile Logistics on Timeliness of Service Provision

R	R Square	Adjusted R Square	Std. Error of the Estimate
.852	.726	.722	.437

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	33.402	1	33.402	174.987	.000
Residual	12.598	66	.191		
Total	46.000	67			

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	1.484	.124		44.208	.000
Last mile logistics	.682	.052	.852	13.228	.000

The model from the analysis in Table 4.9 is;

$Y_3 = 1.484 + .682X$

Where Y_3 timeliness of service provision by the humanitarian organizations and X is last

mile logistic practices.

The results provided in Table 4.10 show that last mile logistics explained 72.6% of the timeliness in service provision by humanitarian organizations in Kenya (r squared = 0.726). This indicates that there was 27.4% of timeliness in service provision by the humanitarian organizations that was described by other aspects that were not considered in the model. These findings indicate that the model had a high explanatory power. Besides, the findings indicate that the model was statistically significant ($F = 174.987$, $p < 0.05$). These results show that the model was a good fit. Moreover, the results of the t test indicate that last mile logistics had a statistically significant effect on timeliness in service provision by the humanitarian organizations in Kenya ($ß = 0.682$, $t = 13.228$, $p < 0.05$). These results show that improvement of last mile logistics practices by one unit would lead to improvement in timeliness in service provision by the humanitarian organizations in Kenya by 0.682.

4.6 Discussion of Findings

The study findings determined that last mile logistics practices had a statistically significant effect on operational efficiency of humanitarian organizations in Kenya ($ß = 0.875$, $t = 26.296$, $p < 0.05$). These findings support the transaction cost theory by North (1992), which posits that engagement into inter-firm logistic engagements and adoption of best practices in last mile logistics enable firms to attain operational efficiency. Moreover, the results indicated that last mile logistics had a statistically significant effect on reputation of humanitarian organizations ($ß = 0.622$, $t = 8.348$, $p < 0.05$) and on

timeliness in service provision by the humanitarian organizations in Kenya (ß = 0.682, t = 13.228, $p < 0.05$). These results concur with the results by Juhász and Bányai (2018) that last mile logistics enables the humanitarian organization to enhance its reputation as a timely and fast responder.

On outsourcing of last mile logistics, the study determined that material handling services (82%), warehouse management services (82%), management of inventory (79%), management of transportation (75%) and ordering of materials and services (72%) were the most outsourced services by the humanitarian organizations. These study results agree with the results by Peng et al. that (2016) that humanitarian organizations would engage external providers of logistics services on those activities that the organization lacks enough capabilities or those activities that external providers could deliver at a lesser cost than if the firm performs the activities itself.

The study findings also indicated that to a great extent, humanitarian organizations considered financial strength (mean = 4.46, std deviation = 0.502), experience (mean = 4.35, std deviation = 0.799), range of services (mean = 4.33, std deviation = 1.183), cost of logistics services provided (mean = 4.29, std deviation = 0.963), reliability (mean = 4.28, std deviation = 0.770), security and safety (mean = 4.13, std deviation = 1.064) and convenience (mean = 4.06, std deviation = 0.896). These support the network theory by Haakansson (1987) which indicates that organizations seek different competencies in their networks to strengthen their position and reduce costs. Besides, the findings agree with Oliver (1990) that inter-organizational associations underscore the prominence of

special associations between different firms, the improvement of trust through constructive long-lasting accommodating associations and reciprocal adaptation of systems and routines through interchange processes.

The study findings indicate that recording and documenting all materials and services received at the distribution centres and warehouses was practiced to a very great extent by the humanitarian organizations (mean = 4.51, std deviation = 0.738). The last mile logistic practices adopted to a great extent were placing orders rapidly and fast tracking them in case of emergencies (mean = 4.42, std deviation = 0.929), assessing logistic needs for every disaster separately rather than conducting assessments for multi-sectors together (mean = 4.33, std deviation = 0.690), conducting needs assessment before seeking any logistic service to establish whether it will serve the purpose (mean = 4.31, std deviation = 0.738) and using logistic companies that provide subsidized and diverse transportation services (mean = 4.29, std deviation = 0.793). These findings support the findings by Kunz et al. (2017) that adopting effective last mile logistic practices was key for humanitarian organizations to deliver on disaster response and relief. Besides, the findings agree with the findings by Baporikar and Shangheta (2018) that with the growing number of disasters, humanitarian organizations require cost effective and versatile last mile logistic practices to link disaster beneficiaries and donors.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The summary of the study findings regarding last mile logistics and service delivery in disaster response among humanitarian organizations in Kenya is provided in this chapter. Besides, this section provides the conclusions and the recommendations.

5.2 Summary of Findings

The study determined that for most of the humanitarian organizations, logistics takes up less than 50% of the organization's funds while few of the humanitarian organizations indicated that logistics takes up more than 50% of their funds. On outsourcing of last mile logistics processes, the study established that most of the humanitarian organizations partly outsourced their logistics services and partly conducted them in-house. Those that wholly outsourced their last mile logistics and those that wholly conducted their last mile logistics in-house were few. The last mile logistic services that were mostly outsourced by the humanitarian organizations were material handling services, warehouse management services, management of inventory, management of transportation and ordering of materials.

While outsourcing last mile logistics services, the humanitarian organizations considered various vendor factors which included financial strength, experience, range of services, cost of logistics services provided, reliability, security and safety and convenience. The factors considered by the humanitarian organizations to a moderate extent while

outsourcing last mile logistics services form vendors included flexibility in operations, management expertise and geographical presence.

The study determined that the humanitarian organizations adopted various last mile logistic practices that included recording and documenting all materials and services received at the distribution centres and warehouses, placing orders rapidly and fast tracking them in case of emergencies, and conducting assessment of logistic needs for each disaster separately instead of conducting assessment for different disasters or sectors together. Besides, most of the humanitarian organizations mostly conducted needs assessment before seeking any logistic service to establish whether it will serve the purpose and used logistic companies that provided subsidized and diverse transportation services.

On the influence of last mile logistics on service delivery of humanitarian organizations, the study determined that last mile logistics had a statistically significant influence on operational efficiency of humanitarian organizations in Kenya. Moreover, the findings established that last mile logistics had a statistically significant influence on reputation of humanitarian organizations in Kenya towards relief and disaster response. Furthermore, study findings determined that last mile logistics had a statistically significant effect on timeliness in service provision by the humanitarian organizations in Kenya.

5.3 Conclusion

The study concludes that the last mile logistic practices adopted in disaster response

among the humanitarian organizations in Kenya include outsourcing some essential last mile logistics services, partnering with various organizations, and engaging in best practices that could enhance their ability to respond to disasters and provide relief services. The last mile logistics service mostly outsourced include material handling services, warehouse management services, management of inventory, management of transportation and ordering of materials and services. While outsourcing these last mile logistics services, the humanitarian organizations considered various vendor factors which included financial strength, experience, range of services provided by the vendor, cost of the logistics services provided, reliability, security and safety, and convenience.

The study also concludes that humanitarian organizations in Kenya engaged in various forms of partnerships in last mile logistics. The humanitarian organizations mostly partnered with government ministries, agencies or departments, donors, not for profit organizations, and private sector organizations. Moreover, the humanitarian organizations adopted various last mile logistic practices that included recording and documenting all materials and services received at the distribution centres and warehouses, placing orders rapidly and fast tracking them in case of emergencies, and conducting assessment for logistic needs for each disaster separately instead of conducting assessment for many sectors or disasters together. Besides, most of the humanitarian organizations mostly conducted needs assessment before seeking any logistic service to establish whether it will serve the purpose, and used logistic companies that provided subsidized and diverse transportation services.

The study, further, concludes that the surveyed humanitarian organizations had attained operational efficiency, reputation, and timeliness in service provision. On the influence of last mile logistics on service delivery of humanitarian organizations, the study concludes that last mile logistics were essential for operational efficiency, reputation and timeliness in service provision by the humanitarian organizations in Kenya.

5.4 Recommendations

Based on the study conclusions, the study makes the following recommendations. First, the study recommends early involvement of all parties in the last mile supply chain planning process to enhance coordination. Besides, the study recommends to humanitarian organizations to coordinate closely with logistics service providers early in every program to permit them to undertake essential measures to outline and analyze the program effectively. Further, the study recommends effective upstream planning that considers the originating locations of the goods so that last mile delivery is smoother and efficient.

The study also recommends that there should be effective orchestrating, communications and planning of the supply chain at every node to deliver cost savings and efficiency, particularly when considering last mile delivery. This would enable the humanitarian organizations to ensure timeliness in delivery and at the same time reducing costs and hence ensuring operational efficiency.

5.5 Limitations of the Study

This study focused on the last mile logistics and service delivery in disaster response among humanitarian organizations in Kenya. The study provided critical evidence on the last mile logistics practices by NGOs in Kenya and how these practices relate to service delivery during disaster response by these humanitarian organizations. The study however, was only focused on humanitarian organization with offices in Nairobi City and this may therefore not reflect on the situation in other parts of the country. Though most large NGOs have offices in Nairobi, there are many small and medium NGOs that do not have offices in Nairobi. When generalizing the findings from this study to other NGOs in the county, these limitations should be considered. Besides, the study only focused on humanitarian organizations and left out last mile logistics providers. Inclusion of these would have provided the study with in-depth findings on the role played by last mile logistics in service delivery in humanitarian organizations.

5.6 Suggestions for Further Study

This study recommends other further studies to address the limitations inherent in the current study. First, the study recommends to include NGOs that have no offices in Nairobi. This would provide insights into the last mile logistics challenges encountered by NGOs that operate in remote locations of the country. Secondly, the study recommends a further study to include last mile logistics providers to have a deeper insight into the role they play in influencing service delivery of humanitarian organizations.

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APPENDICES

Appendix I: Questionnaire to Humanitarian Organizations in Kenya

SECTION A: GENERAL INFORMATION

1. Type of humanitarian organization

   Local [ ] International [ ]

2. Focus of the organization in humanitarian aid

   Relief [ ] Disaster response [ ]

3. Number of years the organization has been in operations in Kenya

   1- 9 years [ ] 10 – 19 years [ ]

   20 years or more [ ]

4. How many years have you worked in this organization?

   Less than 5 years [ ] 5 - 10 years [ ] More than 10 years [ ]

5. How much of the organization's funds are taken by logistics?

   Above 50% [ ] Below 50% [ ]

SECTION B: LAST MILE LOGISTICS PRACTICES

1. Are last mile logistics in this organization outsourced or conducted in-house?

   Wholly outsourced [ ] Wholly in-house [ ]

   Partly outsourced and partly in-house [ ]

2. In this organization indicate whether the below listed last mile logistics services are outsourced or not.

Last mile logistic practices	**Yes**	**No**
Ordering of materials and services		
Hiring of third-party service providers for		

logistics		
Material handling services		
Warehousing management services		
Management of information flow		
Management of inventory		
Management of transportation		

3. If this organization engages in outsourcing of last mile logistic services, to what extent does it consider the below listed factors in selecting the last mile logistic service provider. Rate using the following scale; 1= Very low Extent; 2= Low extent; 3=Moderate extent; 4=Great extent; 5=very great extent).

Partner	**1**	**2**	**3**	**4**	**5**
Experience					
Convenience					
Cost of logistic services provided					
Financial strength					
Reliability / Dependability					
Flexibility in operations					
Security and safety					
Range of services					
Geographical presence					
Management expertise					
Other:					

4. To what extent has the organization partnered with the following organizations to provide last mile logistic services. Rate using the following scale; 1= Very low Extent; 2= Low extent; 3=Moderate extent; 4=Great extent; 5=very great extent).

Partner	**1**	**2**	**3**	**4**	**5**
Government ministries, agencies or departments					
Military					
Police					
Donors					
Not for profit organizations (e.g. church)					
Private sector organizations					
Aid agencies					
Donors					
Private individuals					

5. To what extent has this organization adopted the following practices in its last mile logistics. Rate using the following scale; 1= Very low Extent; 2= Low extent; 3=Moderate extent; 4=Great extent; 5=very great extent).

Last mile logistic practices	**1**	**2**	**3**	**4**	**5**
Before seeking any logistic service, the organization conducts a needs assessment to establish whether it will serve the purpose					
The organization conducts logistic needs assessment for each disaster individually as opposed to multi-sectoral needs assessment					
Material and service ordering is conducted after analysis of supply and demand					
The organization has some humanitarian aid substances in its warehouses (e.g. food, blankets, tents, medicine) for rapid response during emergencies					
In case of emergencies, orders are placed rapidly and fast tracked by the organization					
The organization has a partnership with suppliers of materials and services to cater for rapid response during emergencies					
The organization uses logistic companies that provide subsidized and diverse transportation services					
The organization has strategically located warehouses that facilitate storage, sorting, coordination and packaging of materials for fast delivery to the disaster victims					
The storage facilities used by the organization are well designed to prevent contamination, waste or spoilage of store materials and supplies					

The organization records and documents all materials and services received at its distribution centres and warehouses					
The organization has invested heavily in technology to track and enhance movement of materials, services and supplies to victims during disasters					
The organization uses different transport modes (road or air) to ensure that materials, supplies and services reach the victims as fast as possible					
Various transport optimization models are applied by the organization to ensure that materials, services and supplies reach the victims at the least cost possible					

SECTION C: SERVICE DELIVERY

1. Indicate the extent that the organization has achieved the following service delivery aspects. Rate using the following scale; 1= Very low Extent; 2= Low extent; 3=Moderate extent; 4=Great extent; 5=very great extent).

Service delivery aspect	**1**	**2**	**3**	**4**	**5**
Operational efficiency – Costs in response and disaster relief as reduced					
Reputation - The organization has a reputation as a fast responder in cases of disasters and humanitarian situations					
Timeliness in service provision - The organization has consistently achieved timely delivery of material support and services to disaster victims					

Thank you for your participation