

ROLE OF HUMANITARIAN LOGISTICS MANAGEMENT PRACTICES ON DROUGHT MANAGEMENT RESPONSE IN KENYA

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Abstract

Humanitarian Logistics is a critical set of actions that takes place during natural or man-made disasters to save lives and property. However, the subject is under-researched in comparison to business logistics in profit-making firms where profit is the primary motivation for existence. The main goal of this study was to examine the role of humanitarian logistics management practices on drought management response in Kenya, with the following specific objectives of the study: to examine the role of transport management drought management response in Kenya, to evaluate the role of inventory management drought management response in Kenya, to examine the role of order processing drought management response in Kenya, and to establish the influence of information flow on drought management response in Kenya. The study used a cross-sectional survey. The study's target population was 270 personnel from the National Drought Management Authority in 23 Arid and Semi-Arid Lands counties. A semi-structured questionnaire was distributed via e-mail survey and hand delivery. Secondary data was gathered from both public and unpublished records. The questionnaire's validity and reliability were assessed. The data was analyzed using both quantitative and qualitative methodologies with the help of the SPSS software program version 25. The study discovered that both transport management practices, inventory management practices, order processing, and information flow as humanitarian logistics management practices played a significant role in drought management response in Kenya; thus, the study recommended that managers in humanitarian organizations. Kenya should include humanitarian logistics management practices in their strategic plan, particularly investment in transport management practices, inventory management practices, order processing, and information flow, which may make it easier to bring about innovation in the organization and good information sharing to both suppliers and clients.

Key word

inventory management practices, Transport management practices, information flow practices order processing practices

I. INTRODUCTION

1.1 Background to the Study

Drought is a natural phenomenon that occurs when there is a prolonged lack of rainfall (e.g. a season or several years). It differs from aridity and seasonal aridity because it is a temporary deviation of rainfall and moisture conditions from the mean. It's a slow-moving hazard that, unlike other risks, can last months or even years in severe cases. Drought affects nearly all climatic regions, with droughts affecting more than half

of the planet each year. Rainfall and runoff patterns are more variable in vulnerable areas. Droughts can be classified as meteorological, hydrological, or agricultural, depending on the likely consequences. Drought has a much larger spatial scope than any other hazard, and it is not constrained by basins or political borders. Droughts that last for a long time degrade soil, plant, and animal habitats, as well as cause social upheaval.

Various natural disasters have struck Kenya. Droughts, floods, fires, terrorism, technological accidents, diseases, and epidemics are the most common natural disasters that disrupt people's lives, destroy infrastructure, divert planned resource use, disrupt economic activities, and slow development. Kenya is prone to drought due to its unique eco-climatic conditions, with only about 20% of the country receiving adequate and consistent rainfall. The rest of the country, about 80% of it, is arid and semi-arid, with annual rainfall ranging from 200 to 500 mm and periodic droughts. Droughts have a negative impact on Kenya's economy and population. This is because it: i) affects water supply in both rural and urban areas, ii) leads to reduced hydropower generation and power rationing, iii) causes crop failures and reduced food security, iv) causes human, livestock, and wildlife deaths, v) causes job losses as resources deplete, vi) causes human health to deteriorate due to malnutrition and poor access to quality water, and vii) causes conflicts between communities and wildlife. Droughts wreak havoc on the environment, causing desertification and the extinction of wildlife.

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1.2. Statement of the problem

Drought's effects on the economy as a disaster need not be underestimated. It may cause damage to local infrastructure and buildings, as well as indirect effects such as revenue loss and unemployment (ADSR, 2013). Every year, 250 million people are affected by drought as a disaster, according to the International Federation of Red Cross and Red Crescent Societies (IFRC 2021). Unfortunately, the impact of drought as a disaster on human life and several supply chains is expected to increase in the coming years due to population growth and other external factors. Drought as a disaster poses several challenges to the business environment, including inventory pre-positioning, fast response, efficient procurement, and efficient donation management, due to the high urgency and uncertainty. According to Altay and Green (2006), "a set of activities that are performed before, during, and after the disaster with the goal of preventing loss of human life, reducing the impact on the economy, and returning to a state of normalcy" are included in drought as disaster operations. Mitigation, preparedness, response, and recovery are the four major stages of disaster recovery (Altay & Green, 2006). Logistics Humanitarian activities are those that are related to these four stages (Van Wassenhove, 2006). "The process of planning, implementing, and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from point of origin to point of consumption for the purpose of meeting the end beneficiary's requirements," according to Thomas and Mizushima (2005). Humanitarian operations has been approached from various perspectives: Public administration, health administration, geology, and, more recently, operations and supply chain management are all fields where I've worked. The main studies in the latter are aimed at optimizing the distribution system in order to expedite relief to the affected community (Scarpin et al., 2013).

In the last two decades, there has been a surge in interest in the subject. Nonetheless, a review of recent studies on the subject revealed that the majority of the research was done by American researchers and was based on mathematical models (Leiras et al, 2014). It was also pointed out that studies on natural disasters tend to focus on one-time events, despite the fact that the damage and number of people affected can result in a long-term situation. Non-governmental organizations (NGOs), government, local NGOs, the United Nations, military organizations, and the private sector are among the key stakeholders identified in the studies (Leiras et al., 2014).

The commercial organization and its supply network are an agent that has received little attention in the context of natural disaster operations (Altay & Ramirez, 2010). According to Beamon (2008), in the face of large-scale climate change and growth, supply chain management presents both new challenges and opportunities for managers, particularly in the food and humanitarian sectors. Disasters cause infrastructure damage and logistical chain disruptions, affecting an organization's performance (Altay & Ramirez, 2010). As a result, the focus of this research was on the role of humanitarian logistics management on drought management response in Kenya.

1.3. Objectives of the Study

The objective of the study was categorized into general and specific objectives of the study

1.3.1 General objectives of the study

The general objective of the study was to determine the role of humanitarian logistics management practices on drought management response in Kenya

1.3.2 Specific objectives of the study

The specific objectives of the study was as follows

1. To determine the role of humanitarian inventory management practices in drought management in Kenya
2. To determine the role of humanitarian Transport management practices in drought management in Kenya
3. To determine the role of humanitarian Order Management Practices in drought management in Kenya
4. To determine the role of humanitarian logistics information flow management practices in drought management in Kenya

1.4 Research Questions of the study

The Research Questions of the study was as follows

1. What is the role of humanitarian inventory management practices in drought management in Kenya?
2. What is the role of humanitarian Transport management practices in drought management in Kenya?
3. What is the role of humanitarian Order Management Practices in drought management in Kenya?
4. What is the role of humanitarian logistics information flow management practices in drought management in Kenya?

1.5 Justification of the Study

The policy developers within the drought management sector may rely on the recommendations to come up with relevant policies and strategies for curbing and mitigating losses caused by drought disasters in the Country. The National Drought Management Authority and other relevant stakeholders can identify gaps in the Drought Early Warning System and improve it in future. It is hoped that future researchers may utilize the results of the research as a basis for auxiliary research. This can reduce unnecessary duplications and improve the quality of research being carried out in the country. It can also provide ready data for reference to various stakeholders and scholars. The study will also add value in academic research more specifically relating to Drought Early Warning System, drought mitigation and management.

1.6 Scope of the study

According to (Njoka, 2016) Kenya has 23 Arid and Semi-Arid Lands counties that make up around 88% of the country's land area. From the 23 of them, 9 are arid and the remaining 14 remain to be semi-arid lands. The degree of dryness in the Arid and Semi-Arid Lands counties and athwart counties is uneven. These arid counties are largely

pastoral, with partial yield cultivation. The semi-arid counties are typically agro-pastoral, and practice crop or livestock farming systems. In this study the research focused on determining the role of humanitarian logistics management on drought management in Kenya With focus on National drought management Authority in 23 Arid and Semi-Arid Lands counties.

LITERATURE REVIEW

2.1 Theoretical Framework

A theoretical framework refers to the theory that a researcher chooses to guide him/her in his/her research. In this study, the theoretical framework consisted of theories/models, which exhibit the role of humanitarian logistics management practices on performance using four theories namely: Social Network Theory, the Resource Based Theory, Contingency Theory as discussed here below.

2.1.1 Social Network Theory

Social Network Theory which is also called the Network theory, network analysis (Scott, 2001) has nodes and links as independent construct and node size, density, link strength as dependent constructs. Its proponents include Stanley Milgram (small worlds problem, six degrees of separation), Mark Granovetter (the strength of weak ties) and Barnes who was the first to study social networks. It is a theory social network theory that focuses on the many ways that people interrelate and communicate via the various social networking platforms (Scott, 2000).

According to Haythornthwaite (1996), social network theory understands social relationships in terms of nodes and ties. Nodes are the individual actors within the networks, and ties are the relationships between the actors. There can be many kinds of ties between the nodes. The fact that these kinds of ties can vary in intensity and importance is just one of the many variables that can factor into social network theory. Often the analysis of a network will involve dots of varying sizes and colours connected by lines of differing lengths and thicknesses. A social network analyst will try changing variables and looking at the connections in various ways to discover hidden correlations and trends in the network.

Layton (2006) argues that basically there are two elements in any social network, online or offline; nodes and ties. Nodes are the elements of the network that act - whether they are organizations, small groups, or individuals - and ties are the ways these nodes relate to each other. This could be as minor as an email correspondence or as intimate as a marriage. In its most simple form, a social network is a map of all of the relevant ties between the nodes being studied. The network can also be used to determine the social capital of individual actors. These concepts are often displayed in a social network diagram, where nodes are the points and ties are the lines. The power of social network theory stems from its difference from traditional sociological studies, which assume that it is the attributes of individual actors whether they are friendly or unfriendly, smart or dumb among others that matter. One of the defining elements of social network theory that differentiates it from other sociological sciences is the weight it gives to the relationships between the nodes, as opposed to the attributes of the nodes themselves.

Social networks have also been used to examine how Humanitarian Organizations interact with each other, characterizing the many informal connections that link executives together as well as associations and connections between individual employees at different Humanitarian Organizations (Layton, 2006). These networks provide ways for Humanitarian Organizations to gather information, deter competition, and even coordinate in setting operational policies (Layton, 2006).

2.1.2 Resource Based View Theory

According to Eisenhardt and Martin (2000), Resource-based theory holds that the firm can be considered as a bundle of resources that are heterogeneously distributed across it in this case, Humanitarian Organizations with enduring differences between them. This theory posits that a company must secure an efficient bundle and flow of the right type of resources from its operating environment to stay relevant and prop up its performance (Rungtusanatham et al., 2003). In this theory, resources refer to physical or tangible assets that include plants, equipment; as well as intangible assets such as knowledge, expertise, and other organizational assets. In lieu of this, competitive advantage can result from having a shared ownership of or access to, unique/expensive assets like transport, innovations, and barriers to resources. It is these resources that can enable Humanitarian Organizations to have leverage for competitiveness in the humanitarian operations through the combination of such resources and capabilities in a way that forms the core competencies of each individual humanitarian organization. According to Zacharia, Sanders, and Nix (2011), Research Based Theory (RBT) is critical to many firms due to its competency in logistics and that it can be expensive if a company opts to invest in it. This is because competency is a source of sustainable competitive advantage that Humanitarian Organizations can have over a period of time and whose realization is pegged on the practicability of taking advantage of the resources that a company has to achieve efficiency and effectiveness by utilizing even the resources it does not own. Humanitarian Organizations have therefore relied on outsourcing to gain access to other firm's valuable resources in the competitive market. With the growing need for such resources, Humanitarian Organizations searching and providing such services become reciprocally adapted towards one another and more value dependent. The theory thus suggests that coordination enables firms to be accessible to complementary resources and create much more competitive resource bundles, providing them with a competitive advantage (Zacharia, Sanders & Nix, 2011).

2.1.3 Contingency Theory

Contingency theory states that in diverse situations, different solutions may prove effective (Barney, 2012), rather than propagating universally applicable organization management principles, the theory attempts to demonstrate that different situations necessitate different organization structures (Odhiambo, 2013).

Organizations are affected by numerous contingencies including environment, size and technology. These contingencies are responsible for developing the specific structures and activities of an organization. When there is an incongruity between the contingent variables and the structure, the organization will achieve lower performance

(Akintoye, McIntosh & Fitzgerald, 2010). Kalakota and Robinson (2007) argued that in order to enhance supply chain performance for functional and innovative products, a corporation must change its organizational characteristics and organize its supply chain drivers such as management support and information sharing to create an efficient and responsive supply chain (Lee, 2001).

Effective supply chain integration will likely be tied to a range of strategic, environmental, human and operations variable. For efficiency and effectiveness, a fit must exist between specific supply chain integration and the strategic and environmental conditions (Christopher, 2011). This therefore opines to the essence of inventory management in the implementation of supply chain management practices.

2.1.4 Theory of Constraints

The theory of constraints (TOC) had been widely known as a management philosophy coined by Goldratt, (Cyplik, Hadaś, & Domański, 2009) that aimed to initiate and implement breakthrough improvement through focusing on a constraint that prevented a system from achieving a higher level of performance. The TOC paradigm essentially stated that every firm should have at least one constraint (Simatupang, Wright, & Sridharan, 2004).

As pointed by Simatupang, et al. (2004), collaborating firms shared responsibilities and benefits with their upstream and downstream partners in order to create competitive advantage. When all the supply chain's (SC's) partners were integrated and act as a homogenous entity, profit and performance was enhanced throughout the (SC), as a combination of supply and demand (Santos, Marins, Alves and Moellmann, 2010). Flores & Primo (2008) affirmed that, with the crescent requirement of the market, the logistic process became more and more complex and with much higher levels of demands, especially when related to achieving a competitive advantage (Santos, et al., 2010).

In this study, Theory of Constraints (TOC) used to help firms in inventory, transport management and order processing. By TOC methodology, a logistics was analyzed by means of a holistic view, in other words, it was defined as a group of dependent elements and, therefore, logistics performance was dependent on the efforts of these core elements (transportation, inventory, order processing and information flow). Every system must have had at least one constraint, and this was explained by the fact that if there were nothing to limit the system's performance, it would have been infinite (Santos, et al., 2010). Cyplik, et al., (2009) also recognized that the TOC approach could be used to guide a single firm to concentrate on exploiting resources based on different logistics cost along the supply chain. Simatupang, et al., (2004) applied the TOC thinking process to identify problems in the apparel logistics management and described the bringing together of managers from different firms to cooperate in improving the overall firm profit (Simatupang, et al., 2004; Cyplik, et al., 2009), proposed a conceptual model of locating the time buffer at different positions of participating members to protect actual sales from demand and supply uncertainty.

Goldratt, et al., (2000) conceptualized performance measures to maintain trust amongst the participating members. TOC was therefore useful in measuring the influence

of transport management, inventory management and order processing on performance of manufacturing firms in Kenya.

2.2 Conceptual Framework

2.3.1. Inventory Management

Stevenson (2009) defined an inventory as a stock or store of goods. It was also considered as stocks of anything necessary to do business (Mangarulkar, et al., 2012). Either way, any company that sold goods likely had the materials necessary to sell their products as well as finished products on-hand (Laird, 2012). These materials and finished products kept on-hand were the company's inventory. Stevenson (2009) referred to inventories as "a vital part of business," as they "were necessary for operations and they also contributed to customer satisfaction. Mangarulkar, et al., (2012) stated that "stocks...must be well managed in order to maximize profits" and "many small businesses could not absorb the types of losses arising from poor inventory management." Clearly inventory management is important to business and vital to logistics success (Laird, 2012). The inventory requirements of a firm were directly linked to the facility network and the desired level of customer service (Bowersox, et al., 2010). Theoretically, a firm could stock every item sold in every facility dedicated to servicing each customer, but very few business operations could afford such an expensive inventory deployment strategy because the risk and total cost is prohibitive (Bowersox, et al., 2010). In their book on supply chain logistics management, they stated that the objective of an inventory management was to achieve desired customer service with the minimum inventory commitment. Excessive inventories would compensate for deficiencies in basic design of a logistics system but ultimately resulted in higher than-necessary total logistics cost.

2.3.1.2 Transport Management

Transportation will be defined as the activities involved in shipping any goods or finished products from suppliers to a facility or to warehouses and sales locations (Kenyon & Meixell, 2011). It was included because it was a major part of the supply chain due to its power to add value to some goods by moving them from their current location to a more advantageous location (Laird, 2012). Through research, (Atos, 2012; Kenyon 2011; Xiande, 2008; Hausman, 2005; Gunasekaran, 2003) transportation had been found to be a major factor in logistics processes as it was the one which joined the separated activities. It was the most important economic activity among the components of business logistics systems (Tsen, Yue & Taylor, 2005).

According to Bowersox et al., (2010) speed of transportation was the time required to complete a specific movement. Speed and cost of transportation were related in two ways. First, transport firms capable of offering faster delivery typically charged higher rates for their services. Second, the faster the transportation service was, the shorter the time interval during which inventory were on transit and the higher the charges (Bowersox, et al., 2010). Thus, a critical aspect of selecting the most desirable method of transportation to a firm is to balance speed and cost of service. Transportation consistency referred to variations in time required to perform a specific movement over a

number of shipments. Consistency reflected the dependability of transportation. For years, logistics managers had identified consistency as the most important attribute of quality transportation (Kenyon & Meixell, 2011). When transportation lacked consistency, inventory safety stocks are required to protect against service failure, impacting both the sellers and buyers overall inventory commitment. With the advent of advanced information technology to control and report shipment status, logistics managers had begun to seek faster movement while maintaining consistency. Speed and consistency combined to create the quality aspect of transportation (Bowersox, et al., 2010). In designing a logistical system, a delicate balance had to be maintained between transportation cost and service quality. In some circumstances low-cost, slow transportation was satisfactory. In other situations, faster service was essential to achieving operating goals. Finding and managing the desired transportation mix across the supply chain was a primary responsibility of logistics management. Transport management efficiency was therefore dependent on how much value a firm was able to gain based on how much they were able or willing to spend on transportation. Lastly it was transport management that made firm goods and products move with lower cost, speed and consistency and provided timely and effective delivery of firm products.

2.3.1.3 Information Flow Practices

With the development of ICT, the flow of information offers a special benefit to connect one activity to the others and make available in the company as well as with external providers, channels and customers in real time data created by business. For the efficient and successful flow of information, the logistics processes of the organization need to be strengthened through planning, tracking, collaboration and tracking logistics processes. The successful operation of the logistics information technology system involves the use of hardware and technology transfer, according to Nowakowska and Grunt (2007), and the information system should be configured to best support a logistics system to improve the contact line (Wisner et al. 2007). Long and Wood (2005) indicated that knowledge management during a crisis is the single biggest success factor. IT helps integrate activities and provide proof of information to improve the functioning of the supply chain. The monitoring and management of relief operations includes complex decision support structures, communications and information structures. These programs enable the planning, response and management of crisis, disasters and emergency situations. Thomas and Kopczak (2005) argued that humanitarian supply chain practitioners need to find ways in which donors and the public can connect about how the effectiveness of the supply chain improves. Maspero & Ittmann, 2008, asserted that it was an opportunity for the humanitarian supply chain to increase its contribution to and for disaster relief by introducing information management, technology, measuring and positioning initiatives. While delivery of disaster relief items is an important role in the supply chain for humanitarian aid, it should be strategic to provide timely information and analyze information for improved information on how operations can be improved.

Information sharing was a key to success of logistics performance (Whipple et al., 2002). In their study, Wardaya, et al., (2013) confirmed that information flow had

become an important element that reflected collaboration within the logistics management and firm performance. Sharing of information on transfer; exchange of information indicating the level and position of inventory; sales data and information on the forecasting; information about the status of orders, production schedules and delivery capacity, and firm performance measures had become essential to all firms (Wardaya, et al., 2013).

As a result, Bowersox, et al., (2010) named four reasons why timely and accurate information flow had become more critical for effective logistics systems' design and operations: Customers perceived information about order status, product availability, delivery schedule, shipment tracking, and invoices as necessary elements of total customer service. With the goal of reducing total supply chain assets, managers realized that information could be used to reduce inventory and human resource requirements; Information flow increased flexibility with regard to how, when, and where resources may be utilized to gain strategic advantage; Enhanced information transfer and exchange capability utilizing the internet was changing between buyers and sellers and redefining the channel relationships (Somuyiwa & Adewoye, 2010).

2.3.1.4 Order Process Management

Order processing is the term used to identify the collective tasks associated with fulfilling an order for goods or services placed by a customer and it formed the basis for the information flow in a logistics system (Christopher, 2010). It had three principal functions that is create a flow of information that preceded the goods, accompanied them and followed them (Christopher, 2010). The importance of accurate information to achieving superior logistical performance had historically been underappreciated. While many aspects of information were critical to logistics operations, the processing of orders was of primary importance ((Bowersox, et al., 2010).). Failure to fully comprehend this importance resulted from not fully understanding how distortion and operational failures in order processing impact logistical operations ((Bowersox, et al., 2010).). Order processing is the term used to identify the collective tasks associated with fulfilling an order for goods or services placed by a customer (Stevenson, 2009).

2.4 Empirical Review of relevant literature

Most research has focused on trying to implement and introduce humanitarian logistics and supply chain management to Humanitarian organizations in trying to make their efforts quicker, efficient and cost effective such researchers include, Kyalo and Omwenga (2018) Clark and Culkin (2007), Thomas (2003), Van Wassenhove (2006), Kleindorfer and Van Wassenhove (2004), Thomas and Mizushima (2005), Tomasini and Van Wassenhove (2004), Qiang and Nagurney (2008), Thompson (2008). Some even further suggest Supply Chain Analytics for Humanitarian Logistics Transformation (Nyaguthie, 2008) focuses on the important role of humanitarian logistics, Networks for Africa in support for the implementation of the Millennium Development Goals.

2.5 Critique of literature review relevant to study

The literature review gives the overview of the available literature which frames or surrounds the problem being researched which is the role of humanitarian logistics on

supply chain performance. The literature review was broad but yet it focused on the previous studies on the role of humanitarian logistics on drought management response in Kenya. Also, there was historical as well as contemporary materials which was able to put the area of study into its context. In this review, the researcher was able to portray some convincing evidence to support its assertions in the empirical studies. On the other end, the researcher was able to cover opposing views in the literature review by indicating future trends in disasters likely to happen if not catered for by the role of humanitarian logistics on supply chain performance with reference to drought management response in Kenya. This research is also able to describe the theories that explain the role of humanitarian logistics drought management response in Kenya. Finally, the researcher is able to reveal the gaps in the knowledge which the research was filled.

2.6 Research gap

The project intended to fill the existing research gap since there have not been any studies conducted on the role of humanitarian logistics management practices on performance of National Drought Management in Kenya in term of inventory management practices, Transport management practices, information flow practices and order processing practices. There has been lack of a clear organizational relationship between the different stakeholders, perhaps giving a roadmap of guidance on what each should observe. This has ultimately led to compromised service delivery by these organizations (Tysseland, 2009). All these are very significant issues that call for their study.

RESEARCH METHODOLOGY

3.1 Research Design

The study adopted a cross-section survey research design. The survey may be qualitative or quantitative. Mugenda and Mugenda (2003) states the advantages of this design: First, it is an efficient way to collect information about a large group of people. It is flexible medium that is standardized, so less susceptible to error, easy to administer and finally it can be tailored exactly to the phenomena the researcher wish to study.

3.2 Target Population

In this study, the target population comprised 270 Programme officers Logistics and supply chain managers and operations managers which was derived from the departments of supply chain management and operations management functions of National Drought Management in Kenya.

3.3 Sampling Frame

The sample frame for this study consisted of a list of 270 employees working at National Drought Management in Kenya. The list was obtained from the National Drought Management in Kenya human resource department registries.

3.4. Sample size and Sampling Techniques

In this section, the study examined sampling technique, sampling procedures, as well as derivation of the sample size. Stratified random sampling was adopted in this study. A sample in this study referred to the respondents from which information was

obtained (Kinyanjui, 2014). This study defines sampling as the process of selecting these groups.

The sample size of the study was 73 Programme officers Logistics and supply chain officers and operations officers

3.5 Data Collection Instruments

The choice of instruments was dictated by the nature of the problem and both the availability of time and financial resources. There are two major sources of data that was used by researchers. These are the primary and secondary sources. In this study the researcher used both primary and secondary sources of data. Primary data was gathered using structured and semi-structured questionnaires. Questionnaires are regarded as effective data collection instruments that allowed respondents to give much of their opinions pertaining to the research problem.

Secondary information sources are data neither collected directly by the user nor specifically for the user. Secondary data means data that are already available (Kothari, 2006). It involves gathering data that already has been collected by someone else. This involves the collection and analysis of published material and information from internal sources. Secondary data collection may be conducted by collecting information from a diverse source of documents or electronically stored information. This is often referred to as desk research..

3.6 Pilot Test

Before the actual data collection, the pilot test was done. In accordance with (Kothari 2006) at least 10% of the sample consisted of the pilot test that is 7 respondents. In this study, the questionnaire was pre-tested using a representative sample identical to, but not those to be included in the actual study, before administering it to respondents in a field setting. Such pre-testing is important as it may uncover ambiguity, lack of clarity or biases in questions wording, which should be eliminated before administering to the intended sample. The pilot test helped in detecting potential problems in research design and instrumentation as well as helping to check whether the questions asked are intelligible to the targeted sample and ensure that the measurement instruments used in the study was reliable and valid measures of the constructs of interest (Orodho, 2008). The suitability of the questionnaires of this study was pre-tested by first administering it to about 7 respondents.

3.7 Data Analysis and Presentation

Data analysis refers to examining the coded data critically and making inferences. The presentation of data refers to ways of arranging data to make it clearly understood. Data will be analyzed using both descriptive and inferential statistics. This is because descriptive statistics helps to describe the data collected and aim to summarize a sample while inferential statistics was used to interpret the meaning of descriptive statistics besides making propositions about population and helped in drawing conclusions. The SPSS Version 25 was used because it is favored for it gave quantitative results.

In this study, the findings was presented using tables. Data presentation was made use of percentages, tabulations, means and other means of central tendencies. Tables was

used to summarize respondents for further analysis and was facilitated comparison. Percentages was used to determine the extent to which respondents view the contributions towards the role of humanitarian logistics management practices on performance of National Drought Management in Kenya. The role of humanitarian logistics management practices was X (independent variables) and performance of National Drought Management in Kenya was Y (dependent variables).

3.8.1 Statistical Models

The study was used multiple regression models to measure. There was four (4) independent variables in this study thus: the multiple regressions used was:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where Y was the dependent variable, (performance of National Drought Management in Kenya) and β_0 was the regression co-efficient while β_1 , β_2 , β_3 , and β_4 , was the slopes of the regression equation.

X1 is the independent variable (inventory management practices)

X2 is the independent variable (Transport management practices)

X3 is the independent variable (information flow practices)

X4 is the independent variable (order processing practices)

I. ϵ is an error term normally distributed about a mean of 0 and for purposes of computation, is assumed to be 0. Error term is the part of the statistical equation that indicates what remains unexplained by the independent variable.