
Supply Chain Integration and Performance of Humanitarian Aid Organizations in Kenya

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Abstract

Humanitarian organizations are struggling to obtain the highest possible performance from their supply chains by utilizing and adopting various supply chain designs. This is upon realization that despite the huge chunks of money pumped into humanitarian sector, stringent oversight by donors and expectations from vulnerable populations, humanitarian supply chains still respond in a sluggish, inefficient and poorly coordinated manner to emergencies. The purpose of this study was to establish the influence of supply chain integration on performance of humanitarian aid organizations in Kenya. The study was anchored on the Relational View Theory and the Theory of Performance. Survey research design was employed for this study as it enabled the combination of both qualitative and quantitative research approaches. The study entailed a census survey of all the 330 humanitarian aid organizations carrying out their operations in Kenya with supply chain managers as the unit of observation. Objectively developed questionnaires were used to collect primary data. Descriptive statistics and inferential statistics was used aided by SPSS version 24 to facilitate data analysis. The data was presented using a combination of statistical and graphical techniques. The study findings revealed that supply chain integration was positively associated with performance of humanitarian aid organizations. The study recommends that humanitarian aid organizations should improve the use of information technology and computerized structures to integrate supply chain processes and ensure distinguishability of internal activities and procedures.

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Additionally, humanitarian aid organizations are recommended to boost their supply chain integration by exploring and embracing advanced and emerging technologies such as big data analytics, internet of things, cloud computing, machine learning, artificial intelligence and block chain. A multi-stakeholder approach that involves representatives from public sector, private sector, humanitarian sector, academia, military, beneficiaries and the media should be involved in drafting disaster management legislations and push for disaster preparedness to be enshrined in it. Further, humanitarian aid organizations have and will always play a crucial part in complex emergencies. This study proposed that all humanitarian supply chain actors come together and formulate a common response to complex emergencies, making use of the different competences of different players.

Keywords: Supply Chain Integration; Humanitarian Supply Chains.

1. Introduction

Organizations are making all efforts to obtain the highest possible performance from their supply chains by utilizing varied assorted means in the contemporary period [1]. Competitive edge can be achieved with no doubt when a company has adopted an effective supply chain strategy and design by utilizing its capabilities on supply chain to realize flexibility, rapid response and efficient cost. In relation to the rising relevance of the supply chain, the competitive focus deviates from rivalry among organizations to contest in supply chain supremacy in the 21st century. Author [2] emphasized that an effective supply chain design could guarantee a secure spot in competition. An organization has the ability to consolidate all its resources to enhance the movement of the products over stream value to achieve needs of consumers if at all its supply chain design is appropriate [3]. According to the United Nations, natural calamities in the coming years will increase in severity, frequency as well as damaging effect [4]. Humanitarian supply chains are responsible for provision of services in emergencies during disasters by availing food, shelter, medicine, water and sanitation [4]. When disaster containment is involved, time is an important factor as time saved means lives saved [5]. Failure to achieve effectiveness and efficiency after the strike of a disaster can lead to lose of lives, undesirable media coverage as well as loss of important donor funding required for future operations [6] Humanitarian supply chain professionals all over the world are faced with the challenge of designing proper supply chains that meet the objective of delivering value and aid to vulnerable people at the same time satisfying donors and funders expectations. This is because of the increase in humanitarian disasters worldwide [7]. There is need to manage and oversee calamity supply chains to guarantee humanitarian aid organizations benefit from having a supply chain framework set up. Humanitarian supply chain is designed to see to it that the humanitarian aid organizations are not exploited even when acquiring goods and services in times of emergencies. Worldwide, supply chain experts are in persistent quest for new and inventive methods for building productive and successful supply chains designs that will adjust to quick changes in catastrophic situations. [8]. According to authors in [9], supply chain management is critical to humanitarian organizations operating in Nigeria. According to the study, there has been constant flooding in Lagos due low coastal location leading increased number of humanitarian organizations. Neighbors, religious homes and relatives offer aid directly to the

victims. This is evidence of a miserable inference on sustainability of disaster management, humanitarian service and supply chains. Authors in [10] reviewed disaster relief logistics in Ghana and how lean and agile practices can be used. The study established that coordination of logistics during relief operations is always an overwhelming task and can endanger lives and properties if quick and practicable actions are not taken. The research demonstrated an effective assessment time but there was delay in delivery of relief commodities. Further, there was revelation on issues relating to availability of resources, coordination of relief actors as well as inventory management, that led to sluggish response to the impacted populous. This ineffective response can be addressed by utilizing leagile supply chain practices. According to authors in [11], there are several complex humanitarian challenges facing East Saharan Africa arising from famines, civil wars as well as natural disasters. The population is highly prone to humanitarian calamities in comparison with the rest of the world. It also suffers from lack of national resources available to support people in times of humanitarian crisis, commonly known as coping capacity. In such circumstances, the international communities chip in to support, manage, procure and distribute most important aids. Nonetheless, since many humanitarian aid organizations are always deployed during the crisis phenomenon, challenges of coordination of the efforts become a big issue. Poor coordination of relief efforts amounts to network congestion and the aftermath could pose a risk to the victims. Hence, the adoption of leagile systems helps solve such challenges in the supply chain [11]. Author [12] examined the extent of implementation of supply chain leagility in humanitarian organizations in Kenya and how it improved their performance. The study noted the numerous humanitarian catastrophes experienced in Kenya including drought, famine, floods, disease outbreaks, food insecurity, conflict and war substantiating the intensity and significance of humanitarian activities in the country. Author [13] on the other side found out the challenges faced by humanitarian supply chains in Kenya as failed comprehension of the important role of supply chains in humanitarian operations, delays in humanitarian tasks, request vulnerability and high expenses. Author [13] further established that half of humanitarian organizations have non-performing supply chains resulting to movement towards leagile supply chain by humanitarian organizations operating in Kenya. Collaboration with other humanitarian partners and organizations, robust information technology infrastructure and staff with the required expertise are key [14]. All this is to meet the primarily objective of the humanitarian aid organizations, which is to save lives, mitigate affliction and maintaining human decency in times of and after crisis while at the same time formulate proficiency in case of similar occurrences [15]. Humanitarian organizations that have effective SCM system gain from precise, accountable, fair and accurately documented procurement process. Generally, the performance of not-for-profit entities is dependent on their capability of raising funds with a view to fulfilling their goals and objectives [16]. As per the findings of author [13], humanitarian organizations need to focus solely on presently required monetary resources and have an exclusive concentration on fundraising as well as financial indicators as this has the ability of shifting the attention from other facets of performance associated with output, effectiveness, quality in addition to client satisfaction. The authors make the observation that measures often are concerned with the outcome of organization activities, measured through assessment of the general impact of the activities carried out in addition to efficiency and efficacy as pertains to resources expended. Variety of researchers have come up with metrics that can be utilized in the assessment of humanitarian performance. According to authors in [17], resources, output and flexibility metrics can be utilized to assess the efficiency, effectiveness as well as ability for responding to a varying environment. Conversely,

author [18] developed a framework for examining the financial performance of humanitarian entities. The framework is composed of fundraising efficiency, public support and expenses as well as cost efficiency. In Kenya, humanitarian entities have huge reliance on donor funding to roll out their operations, leading to responsibility to be accountable [19]. The procurement processes for such entities is subject of periodic audits as they aim at obtaining internal and external assurance of observance of value for money and accountability principles [19]. Consequently, with increased funding attribute to rising number of disasters, accountability, transparency and value for money are becoming critical principles to donors. The primary role of humanitarian supply chain encompass getting value for money, attainment of competence and potency, fostering fair competition among the vendors, as well as enhancement of answerability, openness and ethics. Over the past decade, the humanitarian entities have experienced increased pressure from donors who requires them to provide proof of meeting their objectives in both efficient and effective manner. As donors develop more increased involvement with regard to expenses, humanitarian organizations find themselves in increased scrutiny with regard to monitoring impact of aid, not merely the input and output but the entire operation [20]. Consequently, the organizations have to develop a more result orientation, accountability and transparency in their operations. International Humanitarian entities are collaborating in provision of relief aid to numerous people suffering globally [21]. World Health Organization (WHO) and UN (FAO) make sure that food is availed to those at risk of starving. In the same way, UNHCR and IOM set up camps in addition to other facilities for people forced to vacate their homes. In the event of disasters, WHO further offers protection to the affected people against ensuing diseases, UNICEF on the other hand collaborate with other NGOs including Save the Children to provide education to children affected by calamity. As explained by [22], categorization of humanitarian entities is manifold; government-sponsored humanitarian entities, privately sponsored and registered as NGO's, faith-based humanitarian organizations established by churches and mosques and organizations affiliated to the United Nations Organization (UNO). According to [23], there are many humanitarian organization operations in developing world and every humanitarian organization has the supply chain included. These organizations can be broadly divided into those that are purely originated and are managed by Kenyans and those that are foreign in origin and control [12]. According to author [24], these humanitarian supply chains avail support to fasten readjustment and adaptation, to help create viable living conditions and create the possibility of development. A practical example on the important role played by humanitarian organization in Kenya was the assistance of the 2008 Post-Election Violence (PEV) victims. Kenya has had its fair share of natural disasters, which include; drought, famine, invasions, floods, food insecurity, diseases and manmade disasters like war and conflicts, particularly with the increase of terrorist activities in the country. A comprehensive humanitarian relief establishment has been growing since the Second World War [25]. Humanitarian organizations in Kenya have been the first line of response when Kenyans are faced by various humanitarian challenges. They play a significant role when the country faces natural and manmade humanitarian crises. This is evident from the work they do in arid areas, during floods, disease outbreaks and conflict and terrorist activities in the country. The environment in which humanitarian aid organizations operates in Kenya is highly unstable, with high probability of effect from political and military influences. The operation is further inefficient due to absence of joint planning and inter-organizational collaboration [26]. The entities handles insufficient logistics infrastructure in addition to shifting origins and destinations for relief supplies devoid of warning. Complications further results when disasters are experienced

in remote areas as it happens in most cases. Whichever the case, emergencies demand clear coordination and communication. Humanitarian entities have to ensure there is adequate and timely communication and response to emergencies as well as required supplies and personnel for remedying the situation and making sure of maximum impact of their operations to vulnerable populations [27]. The preparedness and the capability of humanitarian aid organizations in Kenya to act in the face of disasters and have proper supply chain coordination is moot [28]. This concern arises due the increasing number of emergencies putting pressure on humanitarian aid organizations to deliver aid in an appropriate way [29]. The ASALs (vulnerable to hazards) of Kenya make up more than 80% of Kenya's landmass supporting nearly 30% of the total human population [30]. About 70% of the disasters in Kenya are hydro-meteorological in nature particularly droughts, floods and disease outbreaks among others. This calls for responsive and robust humanitarian supply chains to deliver aid in a timely manner to vulnerable populations upon colossal donor funding [30].

1.1 Objectives of the Study

The objective of this study was to establish the influence of supply chain integration on the performance of humanitarian aid organizations in Kenya.

1.2 Research Hypotheses

H₀: Supply chain integration does not significantly influence the performance of humanitarian aid organizations in Kenya.

1.3 Significance of the study

The study was essential as it sought to shed light on the influence of supply chain integration on performance of humanitarian aid organizations, with the understanding that performance is very critical in the functioning of humanitarian aid organizations. This is because ultimate beneficiaries rely on the humanitarian supply chains to provide emergency assistance in times of disasters. The research focus of this study is expected to be significant as it relates to humanity and societal welfare. Since, the study aimed at establishing the influence of supply chain integration covering coordination and collaborations among actors, the results of the study would benefit the entire humanitarian community to have a more precise comprehension about the coordination mechanisms during emergency assistance in the event of a disaster. The study would boost the responsive ability of humanitarians in disaster containment. This would potentially save many lives.

2. Literature review

The underpinning theories in this study included Relational View Theory and the Theory of Performance.

2.1 Relational View Theory

Relational view theory is considered relevant in understanding the influence of supply chain integration on performance of humanitarian aid organizations in Kenya and hence provides the theoretical background for this

study. Authors in [31] advocating for development of transaction exchange relationships into collaborative integrations advanced the relational view theory. The main assumption of this theory is that, a relational rent and competitive advantage can be generated through value-adding initiatives enabled by inter-firm resources and routine. A relational rent is described as a superior profit mutually generated in an exchange relationship that otherwise cannot be obtained by a firm who operates in isolation, but could only be obtained through the mutual contributions of collaborative partners [31]. Simply put, it is when the sum of a relationship's parts create something much greater and more valuable than what individual organizations can achieve on their own. The relational view, introduced by authors in [31] explain that a firm cannot only achieve competitive advantage through its internal resources and the structure of the industry in which it operates but equally could be based on the network and dyads of relationship within the industry in which the firm operates. The authors argued that relational rents are realizable when collaborative collaborates exchange and combine idiosyncratic assets, complementary resource endowments, knowledge and competence through relation defined investments, effective governance mechanisms and inter-firm knowledge-sharing routines [32]. The relational view theory considers networks and dyads of firms as the unit of analysis to explain relational rents generated within that network/dyad. Drawing upon the work of [33] on collaborative inter-organizational relationships as well as the relational view of the firm, conceptualized how supply chain integration function to develop rents. Flow of strategic information between players means the exchange of critical resources and this exchange is defined by time compression diseconomies and made possible by asset partners, and that these correlative vital resources bring about relational rents. Therefore, this theory advocates for collaborative integration within the supply chain brought about through exchange of strategic information that is important to all parties involved. This cooperation can lead to a more integrated supply chain within or outside the organizations. In the humanitarian supply chain, there exists relations of different interactions between different humanitarian supply chain actors. Supply chain players need to interact simultaneously in order to achieve the general objective of the humanitarian aid organization, which is to save lives and rescue the suffering of vulnerable populations. Supply chains should be able to identify the scope of different players in the supply chain in order to allow for seamless interactions of the supply chain activities to have harmonized results due to the contribution of different players in the humanitarian supply chain. In addition, supply chain managers of the humanitarian associations ought to have the option to build up a decent association with service providers and relate well with other humanitarian actors. Supply chain integration entails linking of business operations and procedures within and across organizations to obtain a cohesive and high performing business model. Hence, the relational view theory provides a comprehensive framework through which supply chain integration concept can be understood.

2.2 Theory of Performance

The Theory of Performance traces its origin in a variety of fields but authors in [34] are the theorists most associated with the theory. The authors in [34] considered the performance nature of societies globally and linked events, rituals and daily life to the code of performance. With the application of ethnographic research in different societies and contexts, these theorists underscored the importance of performance on human understanding. The theory of performance is considered relevant in understanding the influence of supply chain integration on performance of humanitarian aid organizations and consequently providing the theoretical background for this study. Author [35] argued that the Theory of Performance (ToP) makes and portrays six

foundational approaches used to explain performance and performance improvements. To perform is to produce valued results. This theory is anchored on performance of humanitarian aid organizations, which is the dependent variable in this study. Authors in [36] observed that, as performance theory insists on alertness and consideration to formal elements of textual representation (structural concerns); it also recommends greater emphasis on context. Performance theory establishes stories to a particular scenario and rewards a narrator who claims the responsibility for the performance. Each performance relies on a player’s claim of responsibility for the emergent event. The basic tenet of the theory of performance is that to perform, is to produce valued or desired results. Performance is perceived as a journey, with a specific point in time denoting the level of performance. The extent of performance is based on six factors: level of knowledge, context, levels of skills, level of identity, personal factors and fixed factors [35]. Authors in [37] further contributed to the theory of performance by linking it to organizational performance. The theory of performance can be applied to the performance of humanitarian aid organizations. As explained, the theory of performance perceives performance as the ability to produce the desired results. In the context of humanitarian aid organizations, the desired results can be measured with the use of different metrics. Generally, the performance of not-for-profit entities is dependent on their capability of raising funds with a view to fulfilling their goals and objectives [16]. According to [38], aid should be reasonable, considerate of human dignity, responsibly overseen and rationally obligated to avoid failure and abuse. The primary role of humanitarian supply chains is getting value for money, attainment of efficiency and effectiveness, fostering fair competition among the vendors, as well as enhancement of accountability, transparency and ethics [19]. Donors who fund humanitarian aid organizations in Kenya demand accountability, transparency and value for money, and hence these can be considered as the desired results for humanitarian aid organizations.

2.3 Conceptual Framework

A conceptual framework denotes a model of presentation in which the researcher conceptualizes or provide a presentation or association among variables in the research and depict this association graphically or figuratively [39]. Consequently, this study aimed to establish the influence of supply chain integration on the performance of humanitarian aid organizations in Kenya.

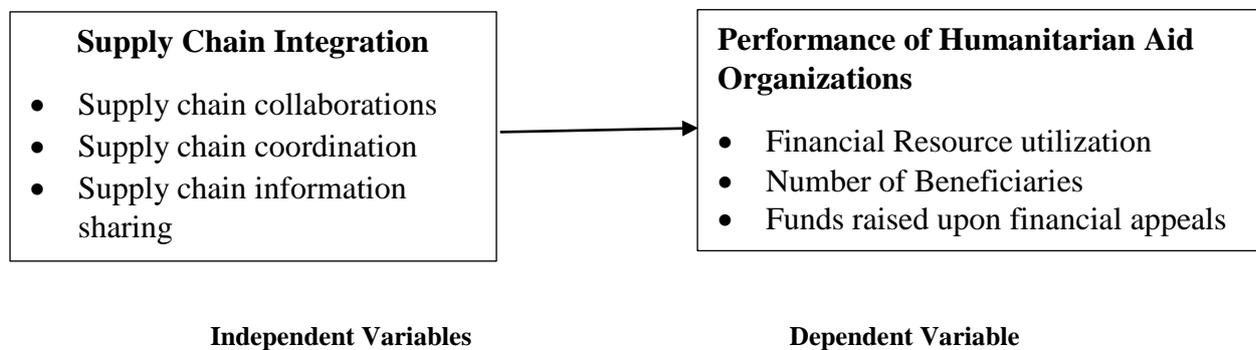


Figure 1: Conceptual Framework

2.4 Supply Chain Integration

The degree to which a range of activities and parties of an entity are conjoined and unified together, including effective communication and information flow among all the actors in the supply chain is termed as supply chain integration [29]. Integration is the term used in describing the various associations existing among departments within a single company or the association among different firms. For instance, internally and externally, firms are able to integrate varied actions as per their operations. Integration not only provides knowledge but further lead to varied problems. Managers have the ability of designing the form of integration to be focused on and the actions to be taken, when different forms of overlapping of integration and procedures to be followed [29]. The level of supply chain integration have the ability of enhancing the performance of the entity [40]. Supply chain integration is a combination of exercises responsible for the coordination of product movement among supply chain partners with respect to the elemental information flows [41]. Author [42] also defined supply chain integration as the strategic collaboration of both intra-organizational and inter-organizational processes. The significance of supply chain integration is evidently crucial [43]. Supply chain integration involves laying out coordinated flows of information and materials that facilitate the assimilation of reliable processes across the extended supply chain. It entails exchange processes and coordination tactics between supply chain partners [41]. Reliable information and material flows eradicate boundaries between supply chain partners, and help reduce uncertainty in the supply chain hence improving supply chain performance [44]. Supply chain integration is multidimensional, and a single construct might not represent all what it entails. While some researchers view it from the activity perspective as customer integration, supply integration and internal integration [45], others view it from the behavioral and relational perspective of firms [46]. Through information systems, business networks could be built to ensure the seamless flow of information, financial, and material resources for the delivery of value to stakeholders within supply chains. The inability of firms to integrate their supply chains could results in the missing out of benefits that emanates from the integration of supply chains. Collaboration is an important concept in the supply chain integration, which implies working together during disasters. Collaborations or cohesiveness in humanitarian organizations is not an end by itself, rather it assist organizations in attaining tangible benefits [47]. For instance, through collaboration, increased coverage can be attained. In an atmosphere with demand for humanitarian work, analysis is important in determining humanitarian response performance. Majority of crisis experienced in the contemporary environment are too big to be handled by one organization, which creates the need for collaboration. Collaboration and cohesiveness also fosters the effectiveness of humanitarian logistics [47]. Effectiveness denote the degree by which an activity attain what it aimed at achieving [48]. Coordination (operational integration) is another important component of the supply chain integration. Response to the humanitarian needs through operations led by humanitarian organizations need to be based on principles of humanity, neutrality as well as impartiality. The three factors forms the primary principles of by which humanitarian entities need to be based on, with humanity implying that people need to be protected and their dignity preserved [49]. On the other hand, impartiality encompass the view that aid need to be provided to those requiring it without any discrimination. Conversely, neutrality entails provision of relief without any bias to all groups of people. The primary goals of coordination in the humanitarian relief content is therefore to react to disaster of manmade or natural kind in the most effective and efficient way. Coordination entails logistics and transportation, which are essential for humanitarian organizations as better coordination of these components reduce cost related to operations and foster services [49]. During disasters, numerous organizations come

together to respond to disaster and without proper coordination, therefore efforts cannot be effective. Therefore, coordination of organization and agencies is critically important to respond better to the needs and wants of affected people. Another critical facet of supply chain integration is information sharing which denotes the degree by which important and definitive information is passed in a particular supply chain. The nature of information could be strategic or tactic, about logistics activities, about affected populations, availability of products, levels of inventory and status of production requirements [40]. Extensive research shows that information exchange between supply chain partners has considerable impact on organizational fulfillment and proficiency of the supply chains. Through information exchange, organizations are able to decide on placement of orders, capacity allocations, production and material planning due to better visibility of demand, supply and inventory. In particular, author [50] indicated that information exchange between partners in a supply chain creates an advantage on the performance of an organization, due to the eradication of uncertainty of the obtained information thereby amounting to the achievement of a platform for sharing systemized information. Today, firms that seek to streamline their operations across different actors rely on information systems to support their internal and external functions. Information systems utilization in supply chains enhances the exchange of information by connecting people, materials, and processes. Internal functions of a firm and its external relationship with partners is coordinated where information systems are used in a shared architecture. Information systems are the virtual ingredients that knit supply chain partners towards effective and efficient supply chain performance [51].

2.5 Empirical Review

Various studies have been carried on supply chain information sharing, integration and collaborations among supply chain members. A study by author [52] indicated that upholding a good supplier relationship, effective and efficient internal operations, constant advancement, adoption of technology to hasten humanitarian activities, inter-organization integrations and simplicity in internal operations are among the practices rampant within the humanitarian circle. Authors in [53] established the supply chain management obstacles encountered by humanitarian organizations as delayed delivery of the needed products, faulty information integration, and unpredictability in demand among others. At the basic level, supply chain integration refers to companies and/or organizations operating together to find solutions to their problems and to accomplish common goals [54]. The difficulty in running supply chain integration sets in when deciding with whom and when to collaborate, why it is necessary and how to implement integration [55]. It is hence important to comprehend the context and the type of collaborative relationship between partners in order to obtain suitable results. The success of integration in a way relies on cultural and strategic factors such as trust, corporate focus, intra-organizational support, communication. Author [56] examined inter-organizational factors, coordination mechanism initiatives and performance. The study used a sample of 101 respondents from humanitarian organizations across six countries in Southeast Asia. The findings showed that supply chain visibility and complementarity are the main inter-organizational factors for effective coordination mechanism in a humanitarian set-up, while total perceived interdependence was disclosed to be insignificant pooling of effort among humanitarian organizations. Resource allocation and standardization reflects a great deal of impact on the performance of humanitarian supply chains on basis of resource, output, flexibility and accountability. Authors in [57] researched the determinants of effective logistics coordination among humanitarian organizations in Kenya. The study was based on a sample

of 92 logistics coordinators and heads of operation drawn from the Kenya Red Cross Society; Concern worldwide, Danish Refugee Council, Oxfam Kenya and world Vision-Kenya all identified as the major inter-related humanitarian actors with analogous obligations. The general results of the research showed that logistics coordination is poorly embraced among relief giving organizations in Nairobi. Authors in [58] probed the internal integration in humanitarian supply chain management. Underpinned by services supply chain management (SSCM) theory, a particular case study of a top global non-governmental organization was presented according to a web-based survey of the organization's global operations staff, reinforced by semi-structured interviews carried out within high-ranking personnel. The findings implied a significant divergence between the views of these two cohorts, along with a generalized absence of precision/clarity in the concept of SCM, its relationship with logistics and the cross-functional nature of SCM. Authors in [59] noted that an integrated supply chain help organizations to design the supply chains as either lean or agile supply chains. When a supply chain is designed towards the lean approach, the integration is geared towards achieving efficiency in the supply chain as opposed to quality, cost and reduced delivery time. However, the authors also asserted that agile supply chains help firms to maintain a flexible relationship with their supply chain partners. A study by [60] on the effect of supply chain integration on supply chain performance suggest that the effectiveness of supply chains based on the extent of integration between the actors along a supply chain is predicted by the level of information and operational interaction between the various actors along the supply chain.

3. Research Methodology

A survey research design was employed for this study. This research design is appropriate where large population geographically spread is involved which was the case in this study. The design enabled the study to apply both qualitative and quantitative research approaches as observed by [61] that the two approaches reinforces each other. This study was guided by a positivism research philosophy, which is part of epistemological viewpoint. The target population of this study was 330 humanitarian aid organizations carrying out their operations in Kenya as derived from the NGO Coordination Board of Kenya. This study was a census examining the entire population [62], supply chain managers in this case, which have a particular set of characteristics such as specific experience, knowledge, skills or exposure to an event. Questionnaires were used to obtain primary data for the study. The questionnaires contained structured and semi-structured questions that captured the various variables of the study. The questionnaires were hand delivered by research assistants to the respondents using drop and pick technique. Concerning the qualitative aspects of the study (open-ended questions), the authenticity of the findings was considered primal thus the researcher hoped that respondents would be truthful by avoiding giving distorted accounts of events surrounding supply chain integration. Descriptive statistics and inferential statistics was employed. The study adopted inferential data analysis in order to enable it make suppositions that extend beyond the immediate data alone to infer from the sample data about the whole population [63]. The study used SPSS version 24 to facilitate the analysis of data. Inferential data analysis was done using Pearson correlation coefficient and regression analysis. Data was also analyzed using descriptive statistics; measures of central tendency, measures of dispersion and measures of symmetry and inferential statistics. Analysis of Variance also sought to test the goodness of fit of the regression models and finally to test the hypothesis of the regression models. Data collected from open-ended questions was analyzed

qualitatively through content analysis. The information was presented using a combination of statistical techniques and graphical techniques. The hypothesis was tested by running an Ordinary Least Square regression model for the combined sub-constructs of the independent variable against the combined measures of the dependent variable. The acceptance/rejection criteria was that, if the P-value is greater than 0.05, the study fails to reject the H_0 but if P-value is less than 0.05, the H_0 is rejected.

4. Research Findings and Discussions

The target population in this study was 330 supply chain managers in humanitarian aid organizations operating in Kenya as derived from the NGO Coordination Board of Kenya. Authors in [64] describes response rate as the degree at which the final data sets incorporates all sample members and is calculated as the number of respondents with whom questionnaires are completed divided by the total number of respondents in the entire sample including non -respondents. The researcher distributed 330 questionnaires from which, 290 were filled and returned, an 87.88% response rate as indicated on Table 1. This was a perfect representation and enough to make generalizations of the study findings. This response rate conforms to [65] affirmation that a 50% response rate is sufficient for analysis; a rate of 60% is good and that of above 70% is exceptional. The outstanding response rate was attributed to the method of data collection used, whereby the researcher, with assistance from research assistants administered questionnaires to the respondents who filled them after which they were then collected. The rate of response rate demonstrated willingness to respond to the study. This praiseworthy degree of response was achieved with efforts by the researcher, who made constant visits and followed up to get the questionnaires filled. The unsuccessful response rate was 12.12%.

Table 1: Response Rate

Category	Frequency	Percentage
Response	290	87.88
Non response	40	12.12
Total	330	100.0

4.1 Descriptive Analysis of the Study Variables

Descriptive statistics is the examination of data to explain, illustrate or summarize data in a meaningful way. Descriptive analysis was used to describe the basic features of the data in the study providing a summary about the sample and the measure thus helping in simplifying massive amounts of data in a sensible and convenient style. It expressed the variables in frequencies, percentages, means and standard deviation. The study sought to establish the influence of supply chain integration on performance of humanitarian aid organizations in Kenya. This objective was measured using the following indicators: supply chain cohesiveness, supply chain coordination and supply chain information sharing in the opinion statements given. Respondents were required to indicate the extent to which supply chain integration influenced performance of humanitarian aid organizations in Kenya. This was on a likert scale of not at all, small extent, moderate, large extent and very large extent. Therefore, in this study the scale of not at all and small extent meant disagree while large and very large extent meant agreed. The results were expressed as percentages, as shown in Table 2 below.

Table 2: Descriptive Analysis of Supply Chain Integration

Statement of Supply Chain Integration	1	2	3	4	5	Mean	Std Dev
	%	%	%	%	%		
Leagility fostered various forms of integration including virtual integration, process integration, collaborative planning and information sharing	0	3.4	31	44.8	20.7	3.83	.792
Our supply chain has effective communication among all supply chain members enhancing the various relationships that exist between departments within one organization or the relationship between various organizations.	0	3.4	13.8	55.2	27.6	4.07	.741
Shipments of the items needed by the firm can be simply organized through the internet or a networked computer system.	0	0	20.7	37.9	41.4	4.21	.762
Information exchange between partners in the humanitarian supply chain has definitive impact on organization performance and efficiency of their supply chains.	0	0	0	55.2	44.8	4.45	.498
Sharing of information makes it possible for humanitarian organizations to make better-informed decisions on basis of making orders, capacity allocations, and material planning, following the better visibility of demand, supply and inventory.	0	0	6.9	51.7	41.4	4.34	.604
Humanitarian organizations have strategic suppliers for various critical products and services especially for catering for emergencies	0	0	27.6	51.7	20.7	3.93	.693
Leagility has enabled partners' input to be considered as pertains to product or services attributes considered during emergencies	0	0	6.9	51.7	41.4	4.34	.604

Key: 1-Not at all; 2-Small Extent; 3-Moderate Extent, 4-Large Extent and 5- Very Large Extent

Majority of the respondents (65.5%) agreed that leagility design fostered various forms of integration ranging from virtual integration, process integration, collaborative planning and information sharing. On the contrary, 31% indicated moderate as 3.4% disagreed that leagility fosters integration. A large number of respondents (82.8%) agreed that their humanitarian supply chains had effective communication among all supply chain members enhancing the various relationships that exist between departments within one organization or the relationship between various organizations involved in humanitarian operations. Of the respondents, 13.8% indicated moderate while 3.4% disagreed that there was effective communications among humanitarian supply chain members. Shipments of the components that humanitarian aid organizations need can be easily arranged through the internet or a networked computer system as indicated by 79.3% of the respondents while 20.7% indicated moderate. Indeed, [66] agrees that substantial developments have been made to the information technology and communication infrastructure to foster enhanced coordination and cooperation between humanitarian actors. All the same, gaps remain concerning the generation, analysis and transmission of proper information before, during and after disasters accredited to the nature of humanitarian response, which can be ideally conceptualized as a complex system. Respondents (100%) upheld that the exchange of information among actors in the humanitarian supply chain has a huge impact on organizational performance and efficiency of their supply chains. Informational exchange by humanitarian organizations facilitates informed decision

making in respect to ordering, capacity allocations and material planning, due to better visibility of demand, supply and inventory as indicated by 93.1% of the respondents. From the response, 6.9% indicated moderate indicating the role of information sharing in humanitarian supply chains. Majority of the respondents (72.4%) indicated that humanitarian aid organizations have strategic suppliers for various critical products and services especially for catering for emergencies. 27.6% moderately agreed to this idea of framework contracting. Lastly, majority of the humanitarian aid organizations (93.1%) enabled partners' input to be considered as pertains to product or services attributes considered during emergencies courtesy of supply chain leagility. Of the respondents, 6.9% indicated moderate. In general, supply chain leagility is fostered in various forms in humanitarian aid organizations ranging from virtual integration, process integration, collaborative planning and information sharing. The findings of this study indicate that humanitarian aid organizations have effective communication among all the supply chain partners. Sharing of this information among supply chain members has a significant impact on the performance of humanitarian aid organizations and efficiency of their supply chains. This is because sharing information allows humanitarian aid organizations to make informed decisions in the event of emergencies or disasters. The findings confirm [67] argument that sharing information among supply chain partners has a leveraging power on organizational performance. This results from elimination of possible inconsistencies arising from the exchanged information ultimately leading to the attainment of a standardized platform for information sharing. Authors in [68] arrived at a similar conclusion that information is one of the elements that connect all humanitarian supply chain actors. In addition, having quality information by supply chain actors amounts to better planning and judgment thereby enhancing the response to beneficiaries. The findings also indicate that humanitarian organizations embrace framework contracting where they have standby strategic suppliers for various critical products and services to cater for emergencies. Embracing leagility design enables humanitarian aid organizations to consider the partners' input as pertains to the attributes of products and services needed in case of emergencies. This aligns with the findings of [69] that preserving a good liaison with suppliers, practical and competent internal affairs, constant progress and keeping up with technology to facilitate swiftness in executing humanitarian duties, inter-organizational integrations and effortlessness in internal processes are some of the practices rampant among humanitarian organizations in Kenya. Further, [70] identified poor information integration as one of the supply chain management challenges encountered by relief organizations in Kenya.

4.2 Qualitative Analysis of Supply Chain Integration

Thematically, recurrent themes were drawn from qualitative responses received from the supply chain managers. As many potential themes as possible were manually coded for purposes of establishing patterns. Examination of supply chain managers' views on supply chain integration was sought using three items in the research instrument. The first question sought to identify the various actors involved in the flow of goods, services and information to alleviate suffering people. The second question sought to identify the connections existing between humanitarian aid organizations and various supply chain members in the effort of delivering emergency assistance. The third question sought at the complexities posted by the several partners in humanitarian supply chains. Six actors involved in the process of alleviating suffering of vulnerable people emerged. From the views of supply chain managers of humanitarian aid organizations in Kenya, the commonly identified included donors, logistics providers, military and police, governments, media and public opinions.

Respondents identified the important role and connections of the various supply chain actors in the flow of goods, services and information as indicated. All the participants identified logistics providers to be imperative and that their responsibilities in humanitarian aid included activities such as assembly of goods, transport, warehousing and distribution of the supplies. Host logistics or regional logistics providers could affect the operational effectiveness of the humanitarian logistics operations. Therefore, the logistics providers have a crucial responsibility in delivery of aid to the victims in a disaster. Donors emerged important actors since it is essential to raise enough financial resources for major crisis containment, which makes financing a significant field for humanitarian organizations. Donors can be specific countries or individuals, foundations and the private sector play part by funding humanitarian operations. Furthermore, national and local governments usually in terms of coordination often influence the activities of the humanitarian aid organizations. Host government influences the participation of other nations. Author [71] asserted that national and county governments hold a primary role in keeping their citizens safe from avoidable disasters and taking charge of disaster response activities. However, while some act in apt commitment and disaster containment, others lack the necessary capacity or use their efforts in a partisan way. Inspired by this, [72] added that governments hold the main power with the control they have over political and economic conditions and directly affect supply chain processes with their decisions. The media has a key role in disaster relief operations and their function is mainly related to donations. The media creates widespread knowledge of the status of the disaster hence resulting in humanitarian organizations getting donations. Humanitarian aid organizations therefore rely on the media to reach out to donors and receive donations to fund the relief operations. Humanitarian aid organizations also use their connection to the media to bring to the light the things they believe need more attention. They are also able to appeal to donors to provide more support. Lastly, the military and police involvement can lead to controversy on basis of practical, political and ethical issues. Nevertheless, the military and police can be helpful in complicated relief circumstances as they can provide support in terms of communication, logistics and planning. Concisely, the findings of this study indicate that humanitarian aid is not a one-man show and all the parties involved are potential influencers of the humanitarian supply chain activities. The participation of many different actors leads to complexity of relief activities thus calling for supply chain integration and proper coordination of humanitarian activities. In addition, the findings of this study indicated that there is poor coordination and poor information sharing among the humanitarian actors during inter-agency disaster response thus negatively influencing collective decision-making and actions. The vitality of coordination in crisis response is unquestioned and lack of it could lead to many deficiencies such as wrongful distributions of first responder resources; counter-productive ordering of sequential relief processes and slow evacuations, which lead to escalation of the emergency and surges in numbers of victims. The findings of this study corroborates with author [73] that humanitarian actions mostly involve large numbers of domestic and global actors, who for many times work in the same topographical settings targeting the same objectives. Nevertheless, coordination and collaboration among them has never reached the desired limits. Authors in [74] confirmed that failure of humanitarian supply chain actors to coordinate could result to gaps in coverage and to duplications and inefficiencies in any given emergency response. The increase in number and diversity of humanitarian actors contributes in making coordination appear complicated. The findings of this study go hand in hand with [75] that humanitarian activities are criticized due to their failure to coordinate and collaborate during humanitarian operations. The authors in [76] noted that coordination and cohesiveness is difficult to achieve because of

variations in structures and systems among humanitarian aid players. Author [77] calls for more coordination among humanitarian aid organizations in the wake of increased complexity of disasters. The old adage that a supply chain is as strong as its weakest link as espoused by [78, 79, 80] is clearly manifested by the findings of this study strengthening the need for supply chain integration. Thus, in the humanitarian context, the humanitarian supply chain is as leagile as its least responsive, resilient, efficient and cooperative chain actor.

4.3 Test of Hypothesis: Supply Chain Integration and Performance of HAOs

A correlation analysis for the construct supply chain integration was conducted to find out how Supply chain integration correlated with performance of HAOs. Table 3 shows that the Pearson correlation coefficient was 0.639. These findings indicate that there is a positive linear relationship between supply chain integration and performance of HAOs

Table 3: Correlation Analysis for Construct Supply Chain Integration

Variable		Performance of HAOs	Supply Chain Integration
Performance of HAOs	Pearson Correlation	1	.639*
	Sig. (2-tailed)		.000
	N	290	290
Supply chain integration	Pearson Correlation	.639**	1
	Sig. (2-tailed)	.000	
	N	290	290

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The researcher conducted regressed performance of HAOs on supply chain integration to establish the influence of supply chain integration on the performance of HAOs. The hypothesis to test for this specific objective was:

H₀: Supply chain integration does not significantly influence the performance of humanitarian aid organizations in Kenya.

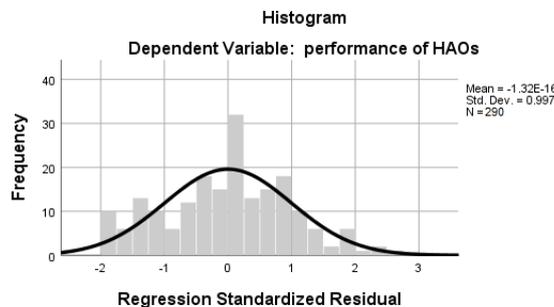


Figure 4. 1: Histogram Supply chain integration on performance of HAOs

The histogram in figure 4.10 indicates that the data was normally distributed. The residual describes the error in

the fit of the model to the i^{th} observation y_i and are used to provide information about the adequacy of the fitted model. According to [81], analysis of the residual is frequently helpful in checking the assumption that errors are normally distributed with constant variance, and in determining whether additional terms in the model would be useful. The linear regression model shows $R^2=0.409$ which means that about 40.9 percent of the change in the performance of HAOs in Kenya can be explained by supply chain integration. The result is shown in Table 4.

Table 4: Model Summary of Supply Chain Integration

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.639 ^a	.409	.398	.73092

a. Predictors: (Constant), Supply Chain Integration

b. Dependent Variable: Performance of Humanitarian Aid Organizations

Table 5: ANOVA of Supply Chain Integration

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.990	1	7.990	13.080	.000 ^b
	Residual	175.929	288	.611		
	Total	183.919	289			

a. Dependent Variable: Performance of Humanitarian Aid Organizations

b. Predictors: (Constant), Supply Chain Integration

The ANOVA result in Table 5 indicates that the significance of the F-statistic ($p < 0.05$) is less than 0.05. This implies that supply chain integration has a significant influence on performance of HAOs in Kenya. The result in Table 6 gives the coefficients and t-statistic of the obtained from the model. The constant term $\beta_0 = 5.597$, indicates that if supply chain integration is held constant, then there will be a positive performance of HAOs in Kenya by 5.597. The regression coefficient for supply chain integration was positive and significant ($\beta_1 = 0.268$, $p < 0.05$), with a t-value of 2.424. This implies that a unit increase in supply chain integration is predicted to lead to 0.268 increase in the performance of HAOs.

Table 6: Coefficients of Supply Chain Integration

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	5.597	.464		12.069	.000
	Supply Chain Integration	.268	.071	.639	2.424	.000

a. Dependent Variable: Performance of Humanitarian Aid Organizations

Performance of Humanitarian Aid Organizations = 5.597 + 0.268 Supply Chain Integration

From the results in Table 3 to Table 6 above, the null hypothesis that supply chain integration does not significantly influence the performance of humanitarian aid organizations in Kenya, is rejected. This result revealed that supply chain integration had significant positive influence on the performance of HAOs in Kenya.

The study mirrors the findings by [60] that the effectiveness of supply chains based on the extent of integration between the actors along a supply chain is predicted by the level of information and operational interaction between the various actors along the supply chain. Authors in [82] argued that peak states of coordination, cooperation and collaboration among the actors in relief activities are essential for efficient logistics processes in procurement of goods, transportation and warehousing. The absence of the three factors during the making of decisions could lead to distasteful decisions, which can have a negative impact on the recipients' wellbeing. To reach the peak of humanitarians' performance, various relief actors ought to strive for increased coordination, cooperation and collaboration in the course of relief operations. Author [83] asserts that insufficient coordination and cooperation among humanitarian actors occasionally amounts to surplus amounts in some places and deficiency in others. Authors in [82] argued that the competitive nature of humanitarian organizations signify immense obstructions for performance enhancements in disaster and relief. The findings of this study confirm [84] argument that disaster response attracts diverse stakeholders or role players. The different role players come with divergent expectations, equipment and mission, which sometimes create discord amongst them. The discord amongst the different role players impedes the effectiveness of humanitarian supply chains thus the importance of supply chain integration. Authors in [85] further noted that the success of disaster response depends heavily on the information available and the coordination of activities by diverse role players. In agreement with the study findings is [86] who affirmed the importance of supply chain integration as it entails designing coordinated flows of information and materials that help firms create smooth processes throughout the extended supply chain. Smooth information and material flows blur boundaries between supply chain partners, and enable humanitarian organizations to reduce uncertainty in the supply chain thereby enhancing their performance. The findings of the study mirror [87] that during the relief operations in disasters the performance of the humanitarian aids supply chain is affected awkward due to lack of coordination approaches and less joint and holistic supply chain strategies between operation management and human actors that are performing in the scene. On the contrary, [41] established that collaboration between humanitarian organizations is not an easy task because of many barriers, as each humanitarian organization has their own structure, IT system, management style and different rules of procedure.

5. Conclusion

A conclusion made by the study is that supply chain integration has significant influence on performance of humanitarian aid organizations in Kenya. The findings of this study indicated that humanitarian aid organizations have effective communication among all the supply chain partners. Sharing information allows humanitarian aid organizations to decide on better choices and to make informed decisions in the event of emergencies or disasters. In addition, when players have quality information it results in better coordination and making informed decisions, which translates to better services for beneficiaries. Further, notable developments had been made to the information technology and communication infrastructure to enhance organization and cooperation between the involved players. However, gaps remained regarding obtainment, assessment and distribution of quality information before, during and post a disaster. This could be a result of the state of response, which can be ideally conceptualized as a complex system. It can be concluded that humanitarian organizations embrace framework contracting where they have standby strategic suppliers for various critical products and services to cater for emergencies. Embracing leagility design enables humanitarian aid

organizations to consider the partners input as pertains to the attributes of products and services needed in case of emergencies. Further, the findings of this study indicate that humanitarian aid is not a one-man show and all the parties involved are potential influencers of the operations. The commonly identified supply chain actors included donors, logistics providers, military & police, governments, media and public opinions. The participation of the many diverse actors contributed to the complexity of relief operations thus calling for supply chain integration and proper coordination of humanitarian activities. On the contrary, the findings of this study indicated that there is poor coordination and poor information sharing among the humanitarian actors during inter-agency disaster response thus negatively influencing collective decision-making and actions. The need for coordination in containment of crisis is unchallenged, as lack of coordination has been seen to amount in certain failure, which then results in crisis intensification and possibly a higher number of victims. Failure of humanitarian aid organizations to cooperate can lead to concentration of aid in one place while neglecting others.

6. Recommendations of the Study

The study sought to examine the influence of supply chain integration on performance of humanitarian aid organizations in Kenya, with a view of making recommendations to the humanitarian industry and policy makers. The study recommendations are in line with the objective, findings and conclusion of the study. Based on the study findings, it was noted that supply chain integration had a positive influence on the performance of humanitarian aid organizations in Kenya. The study recommends that humanitarian aid organizations should improve the use of information technology and computerized structures to integrate supply chain processes and ensure distinguishability of internal activities and procedures. For supply chain integration to be effective, data must be readily available, timely, accurate and in a format that communicates necessary information to all supply chain actors. Sharing information significantly increases supply chain integration because information rules out doubt therefore decreasing the quantity of buffer inventory required. Exchange of information promotes vibrant actions and decisions. Exchange of advanced information is vital for the coordination of activities across humanitarian supply chains. There is necessity for better information access to enable humanitarian agencies to respond swiftly to changes in their working environment. Information sharing must be taken seriously, as it is a masterpiece that holds all activities and resources together along the supply chain. In addition, humanitarian aid organizations are recommended to boost their supply chain integration by exploring and embracing advanced and emerging technologies such as big data analytics, internet of things, cloud computing, machine learning, artificial intelligence and block chain. Supply chain functions can utilize big data analytics to unearth insights on demand pattern and inventory to enhance supply chain leagility and changing needs to drive the development and delivery of differentiated products that align with the need. Employing big data can reinforce the swift running of enquiries, precision in demand forecast thereby solving sourcing challenges and reduce the costs of operation. Supply chains can use rising technology such as radio-frequency identification, sensors, GPS tags, chips and barcodes to track and provide real-time information about the position of an inventory and then communicate this data to an application, which enhances the visibility of inventory's route to all supply chain actors and speeds up decision and collaborative efforts. Cloud computing allows various supply chain applications and platforms to work and exchange data with one another in real time with the ability to improve swift communication and order fulfillment thereby improving the efficiency of the

supply chain. Adopting and applying cloud-based technology in humanitarian supply chain management could result in palpable values and benefits such as cost savings, real-time visibility, improved forecasting and planning, streamlined processes, improved security, flexibility enabling leagility design. Supply chains can leverage on block chain technology to monitor and obtain real-time details of a required asset or material, and track shipments to better predict where a shipment is; when it will arrive and in what condition. Block chain can provide enhanced supply chain visibility, which can lead to improved just-in-time planning and accurate inventory management while reducing waste across the entire humanitarian supply chain. Social media can be a valuable way to obtain information from communities. It also provides a platform for communities to raise issues and demand accountability from aid agencies. Through technology, beneficiaries get the opportunity to call the shots in humanitarian response making it beneficiary-driven, thus giving beneficiaries a voice and a tool to self-organize. Humanitarian aid organizations should seek the help of technology in ensuring resilience in their supply chain. The presence of technologies such as in-memory computing and improved analytics algorithms, help organizations solve complicated supply chain questions with ease and without wasting quality time. Rapid analysis and data accuracy are two crucial factors for organizations aiming for resilient supply chains. Organizations need to deploy versatile digital supply networks to be ready to deal with the unexpected and unpredictable events that continue to unfold. In a country with a wide exposure to risks faced by different people at different times, it is necessary to develop strategies and ensure shared earnings between humanitarian actors. A multi-stakeholder approach that involves representatives from public sector, private sector, humanitarian sector, academia, military, beneficiaries and the media should be involved in drafting disaster management legislations and push for disaster preparedness to be enshrined in it. The study recommends for a creation of a disaster preparedness plan that gives the way forward in times of tragedies or natural disasters. This plan should consider all types of hazards every particular place is susceptible to and maybe what is unlikely. The plan should be aligned to other humanitarian actors/partners disasters plans for uniformity. This study further recommends that supply chain professionals should establish strategic collaborative working partnerships and agreements with industry players and experts for example seasoned global freight forwarders, ocean carriers, airlines, overland transporters, critical suppliers and all other humanitarian supply chain actors to allow expertise and near precision responsiveness to needs of vulnerable people. Each one of these players apply their operational expertise, assets and networks to what they do best hence creating a leagile supply chain. Lastly, humanitarian aid organizations have and will always play a crucial part in complex emergencies. This study proposes that all humanitarian supply chain actors come together and formulate a common response to complex emergencies, making use of the different competences of different players. Encouraging public conscience and inspiring donor response is essential to a fruitful response to emergencies. Humanitarian supply chain actors should be strengthened and supported in performing their roles, as this will lead to swift and efficient service delivery to the disturbed populations. Humanitarian supply chain actors need to be familiar with supply chain vulnerabilities and the implications to the community and its lifelines so they can come up with reliable plans of responding to disasters and adapt easily in times of crisis.

7. Limitations of the Study

The study faced a challenge of resistance by respondents to answer questions relating to performance of humanitarian aid organizations, occasioned by the confidentiality policy of most entities in the humanitarian

sector. This was however alleviated by the introduction letter provided by the university that indicated that the data sought in the survey was for academic purposes only, and would be treated with utmost confidentiality. This enabled respondents to freely avail the requested information towards the success of this study. There was a limitation of lack of information coming from the humanitarian aid organizations supply chain managers for fear of information confidentiality not being honored by the researcher as well as victimization. The researcher delimited this by obtaining permission from the management of the firms and from the NGO coordination board of Kenya before proceeding to collect data as well as assuring the respondents of their confidentiality by asking them not to indicate their names on the questionnaires. The limitation of the respondents not giving accurate information due to respondents' divided attention to questionnaires and the desire to safeguard the reputation of the humanitarian aid organizations was delimited by informing the respondents of the magnitude and importance of the data to be collected as well as the ethical requirements expected of them upon consenting to participate in the study. Further, securing the valuable time of supply chain managers to respond to the questionnaires was a big challenge, therefore, the researcher allowed the respondent adequate time to respond to the questionnaires, encouraged the supply chain managers on the benefits and significance of the study and ensured that follow ups were made.

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