



## **Supply Chain Responsiveness 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 examine the influence of supply chain responsiveness on performance of humanitarian aid organizations in Kenya. The study was anchored on the Decoupling Point theory and employed survey research design. 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. Inferential data analysis was done using Pearson Correlation Coefficient and regression analysis. The data was presented using a combination of statistical and graphical techniques. The study findings revealed that supply chain responsiveness had a positive significant influence on performance of humanitarian aid organizations in Kenya. The findings of the study revealed that humanitarian aid organizations in Kenya have supply chains designed to be responsive to the needs of vulnerable populations. The humanitarian supply chains are designed to evaluate, consider and cover needs of vulnerable people quickly while enabling a view of the movements of materials along the supply chains. However, the ability of humanitarian supply chains to respond quickly to emergencies and disasters is a challenging task influenced by various challenges facing humanitarian supply chains. This means that despite the supply chains being designed to be responsive to emergencies, there is still an element of sluggishness in most humanitarian supply chains in Kenya resultant from the challenges faced. To achieve and sustain a supply chain that is responsive to the changing needs and volatile environment, the study recommends the need for organizations to design and implement a supply chain that incorporates lean and agility operation across the value chain. The study established that the culture of disaster preparedness in Kenya is lacking despite the increasing resource allocations for the same. Further, the supply chain professionals should establish strategic collaborative working partnerships and agreements with industry players, experts and all other humanitarian supply chain actors to allow expertise and near precision responsiveness to needs of vulnerable people.

**Keywords:** Supply Chain Responsiveness, Supply Chain Velocity, Supply Chain Visibility, Supply Chain Reactivity

## Introduction

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. The exercise of planning, implementation and controlling of the systematic, feasible movement and storage of goods, materials and associated information from the original point to consumption point with the goal of mitigating the suffering of the vulnerable people is termed as humanitarian supply chain. This form of supply chain encompasses various events that necessitate alertness, strategy, acquisition, transportation, warehousing, inquiry and analysis, custom requirements and clearance among others (Khan, Yong & Han, 2019).

Lodge and Wilson (2016) established that the pressure on humanitarian organizations to handle their roles skillfully during disasters have been braced in the recent times. The ambiguousness humanitarian organizations have to cope with and high expectation of their performance is what necessitated that they quickly and reliably response to temporary changes. Singh and Pandey (2015) established that due to high increase in both natural and manmade disasters, humanitarian activities have gained attention from both logistics academics and practitioners. There should be a set of principles over which logistics strategies of humanitarian organizations faced with events of disaster are to be developed to stimulate effective response since time saved culminate to saving lives. Humanitarian supply chains characteristically hold a variety of items needed by aid recipients and usually experience loss of products due to theft, misappropriation, poor tracking and control as well as product deterioration (Mohammed, 2018). Supply chains play an imperative role in mitigating destruction caused by disasters by delivering items to those in need and ensuring that recovery operations are carried out smoothly (Banikoi *et al.*, 2018).

Owusu-Kwateng, Hamid and Debrah (2017) 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. According to Dufour *et al.* (2018), 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.

According to Koori and Chirchir (2017), humanitarian organizations are important in Kenya as they have the ability to achieve impacts faster as compared to the government. The development of humanitarian organizations have helped and relieved the government of its pressure of delivering aid to the citizens (Twikirize, 2017). Kuria and Chirchir (2014) 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. Clarke (2018) 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.

Reliable humanitarian supply chains ensure that inventory is delivered on time and in sufficient amounts, while resilient supply chains are adaptable to different desired states depending on the type and magnitude of the disaster. Collaboration with other humanitarian partners and organizations, robust information technology infrastructure and staff with the required expertise are key (Mokua & Kimutai, 2019). 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 (Skliarov, Kaptan & Khorram-Manesh, 2017).

### **Statement of the Problem**

The preparedness and the capability of humanitarian aid organizations to act in the face of disasters and have proper supply chain coordination is moot (Shareef, Dwivedi, Mahmud, Wright, Rahman, Kizgin & Rana, 2019). This concern arises due the increasing number of emergencies putting pressure on humanitarian aid organizations to deliver aid in an appropriate way (Olaogbebikan & Oloruntoba, 2017). The ASALs (vulnerable to hazards) of Kenya make up more than 80% of Kenya's landmass supporting nearly 30% of the total human population (Njoka *et al.*, 2016). 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 (Njoka *et al.*, 2016).

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 (Paul, 2019; Kiswili, Shale & Osoro, 2021). Mark you, about 80% of disaster and relief operations are related to supply chains (Maghsoudi, Zailani, Ramayah & Pazirandeh, 2018). The poor performance of humanitarian aid organizations is attributed to poor management of supply chain operations (Bealt *et al.*, 2016). Thus, the inference that humanitarian aid organizations are performing way below the expected levels. Sinha (2019) supports this by concluding that 50% of humanitarian aid organizations have non-performing supply chains. Jahre (2017) described humanitarian supply chains as multiple, global, dynamic and temporary. This is because these supply chains face unpredictability and intricacy same as if not greater than that faced by commercial- world supply chains and involve a wide-range set of collaborators from both private and public sectors with little systemization. This makes them lesser active and responsive than their commercial cousins do. Investing in better performance of humanitarian supply chains could have profound and lasting impact on society (Wagner & Thakur-Weigold, 2018).

### **Objectives of the Study**

The general objective of this study was to examine the influence of supply chain responsiveness on performance of humanitarian aid organizations in Kenya.

### **Research Hypothesis**

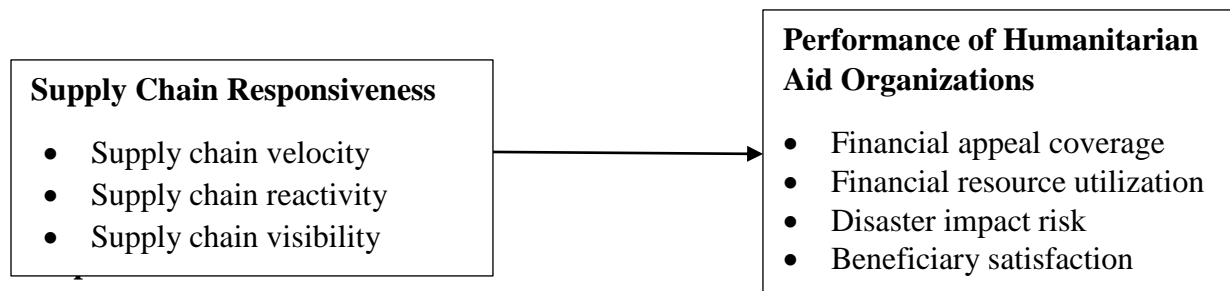
**H<sub>0</sub>:** Supply chain responsiveness does not significantly influence the performance of humanitarian aid organizations in Kenya.

**LITERATURE REVIEW**

Brusset and Teller (2017) depicts responsiveness as separated into three capabilities; velocity, reactivity and visibility. Reactivity is the capacity to assess and consider quickly while velocity alludes to the capacity to cover needs rapidly (Brusset & Teller, 2017). Consequently, as indicated by Vernon (as referred to in (Brusset & Teller, 2017), visibility covers the capacity to see the developments down the supply chain, including identity, position and status of the shipment alongside the programmed and specific dates and times for the events. To conclude, adaptability, viability and responsiveness have been endorsed as proper ground for the agile strategy by Brusset and Teller, (2017) and are portrayed previously. Additionally, agility is necessary when an organization needs a dynamic and adept supply chain structure; therefore, this approach is suitable for humanitarian associations. Be that as it may, this may be a challenge for humanitarian associations because of issues of assets and subsidizing, yet the ideas that have been embraced in business settings ought to be important in this setting as well. To concentrate on supply chain management appears important and prompting cost savings and expanded consumer loyalty (Chavez, Yu, Feng & Wiengarten, 2016). Consequently, improved effectiveness would interest humanitarian entities to participate in such ideas, despite the fact that the supply chains in alleviation tasks have brief span.

**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 (Merriam & Grenier, 2019).



**Figure 1: Conceptual Framework**

**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 Rahi (2017) that the two approaches reinforces each other. 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 (2018). This study was a census examining the entire population (Mujere, 2016), supply chain managers in this case, that 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 responsiveness.

With the study being quantitative and qualitative in nature, both 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 (Trafimow, 2017). 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. Linear regression analysis revealed the correlation and strength of the relationship between both independent and dependent variables. 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 each 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.

**RESEARCH FINDINGS AND DISCUSSIONS**

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. The unsuccessful response rate was 12.12%.

**Table 1: Response Rate**

<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
Response	290	87.88
Non response	40	12.12
<b>Total</b>	<b>330</b>	<b>100.0</b>

**Descriptive Analysis of Supply Chain Responsiveness**

The study sought to examine the influence of supply chain responsiveness on performance of humanitarian aid organizations in Kenya. The results were expressed as percentages, mean and standard deviation as indicated in Table 2 below.

**Table 2: Descriptive Analysis of Supply Chain Responsiveness**

Statements on Supply Chain Responsiveness	1 %	2 %	3 %	4 %	5 %	Mean	Std Dev
Our supply chain evaluates, considers and covers needs quickly by providing basic essentials to alleviate suffering people.	0	0	24.1	51.7	24.1	4.00	0.696
The supply chain has an element of visibility enabling the view of the motion across the entire supply chain, including identification, location and state of transit alongside the scheduled and actual dates and times for events.	0	0	20.7	55.2	24.1	4.03	0.670
Leagility enables reliability of supply chains	0	0	20.7	48.3	31	4.10	0.713
The ability of humanitarian organizations to respond quickly to emergencies might be challenging due to issues of resources, funding and lack of information	0	0	3.4	51.7	44.8	4.41	0.559
A guarantee of the humanitarian supply chain to quickly deliver is a real selling point if that order arrives quickly, accurately and complete otherwise its termed as waste.	0	0	13.8	51.7	34.5	4.21	0.664
Our organization has a close partnership with suppliers that enables delivery of requested supplies within the requested time and place especially when handling a disaster or an emergency	0	0	3.4	41.4	55.2	4.52	0.565
Our supply chain has high degree of flexibility in terms of assembling and transportation structure to meet the needs of suffering people	0	0	17.2	44.8	37.9	4.21	0.715
Our supply chain undertakes activities before disasters occur that enhance the readiness of humanitarian organizations and the society to counter the emergencies.	0	0	6.9	65.5	27.6	4.21	.551
Supply chain preparedness is crucial as it minimizes the time spent in undertaking the immediate response and increase the odds of quick recovery	0	0	10.3	58.6	31.0	4.21	.610

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

Majority of the respondents (75.8%) agreed that humanitarian supply chains evaluate, consider and covers needs quickly by providing basic essentials to alleviate suffering of vulnerable people while 24.1% indicated moderate extent. Large number of respondents (79.3%) agreed that their supply chain has an element of visibility enabling the view of the movements across the supply chain, including identity, position and state of transit alongside the arranged and actual dates and times for the events as 20.7% moderately agreed. Elsewhere, 79.3% of the respondents agreed that leagility enables reliability of humanitarian supply chains while 20.7% moderately agreed that reliability is enabled by leagility design of the supply chains. The ability of humanitarian aid organizations to respond quickly to emergencies might be challenging due to issues of resources, funding and lack of information as indicated by 96.5% of the respondents who agreed and 3.4% of the moderate responses. Majority of the respondents (86.2%) agreed that, a guarantee of the humanitarian supply chains to quickly deliver is a real selling point if that order arrives quickly, accurately and complete otherwise it is termed as waste while 13.8% moderately agreed.

Respondents were asked to indicate whether humanitarian aid organizations had a close partnership with suppliers that enables delivery of requested supplies within the requested time and place especially when handling a disaster or an emergency, 96.6% and 3.4% agreed and moderately agreed respectively to the statement. Further, majority of the respondents (82.7%) agreed that supply chain has high degree of flexibility in terms of assembling and transportation structure to meet the needs of suffering people as 17.2% indicated moderate. Respondents agreed that their supply chain undertook pre-disaster activities that enhanced the readiness of

humanitarian organizations and the society to counter the emergencies. This was important for supply chain preparedness which respondents termed as crucial as it minimizes the time spent in undertaking the immediate response and increased the odds of quick recovery

In general, the findings in Table 2 found out that humanitarian aid organizations in Kenya have supply chains that are designed to be responsive to the needs of vulnerable populations. The humanitarian supply chains are designed to evaluate, consider and cover needs quickly while enabling a view of the movements along the supply chain. Further to increase the element of supply chain velocity and reactivity, humanitarian aid organizations have established close relationships with suppliers in the effort to improve responsiveness. The humanitarian supply chains are also designed to be flexible to meet the needs of vulnerable people in aspects of transportation, assembling and dispatch.

However, the ability of humanitarian aid organizations to respond quickly to emergencies and disasters is a challenging task influenced by the various challenges facing humanitarian supply chains such as lack of information, insufficient resources and poor funding. This means that despite the supply chains being designed to be responsive to emergencies, there is an element of sluggishness in most humanitarian supply chains in Kenya resultant from the challenges faced. This shows lack of preparedness by humanitarian aid organizations in responding to emergencies and disasters. Preparedness entails all the activities undertaken before a disaster occurs that enhance the readiness of humanitarian organizations and the society to counter the emergencies. Gikonyo (2017) asserted that preparedness measures are crucial as they minimize the time spent in undertaking the immediate response and increase the odds of quick recovery. During the preparation phase, hazards/risks are acknowledged and strategies designated to address response and recovery necessities. The findings of this study concurred with Rodríguez-Espíndola, Chowdhury, Beltagui and Albores (2020) study that identified the humanitarian supply chain management challenges as delayed delivery of the appropriate products, lack of disaster preparedness, faulty information integration and uncertainty in demand among others.

### **Qualitative Analysis**

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. Exploration of the views of supply chain managers on supply chain responsiveness was conducted using three items on research instrument. First, the various disasters that disrupt communities/societies triggering the need for supply chain responsiveness. Secondly, the strategies humanitarian aid organizations adopt to make their supply chains more responsive. Lastly, respondents were asked to identify the driving forces making humanitarian aid organizations design their supply chains to be responsive to societal needs.

The study sought to determine the various disasters and situations triggering the need for supply chains to be responsive by disrupting communities at large in Kenya. The findings indicated that Kenya has been subjected to various disasters, which are classified on basis of origin and cause as either manmade (anthropogenic) or natural in nature. Commonly identified natural disasters included disease outbreaks, plagues/invasions, floods, landslides/mudslides, droughts and famine. Additionally, though utterly devastating but occurring less frequently in Kenya, other natural disasters (geographic in nature) included earthquakes and volcanic eruptions. Common manmade disasters identified included structural/buildings collapse, chemical leaks, spillovers, manmade fires, terrorist activities, human conflicts, traffic accidents and politically instigated violence. The findings fit with Bamgbose (2017) proposal that manmade disasters, commonly

known as anthropogenic disasters because they occur from human activities, can be categorized into technological, sociological and transportation disasters. From the views of the respondents, the diversity, frequency of occurrence and magnitude of the disasters has dramatically increased in the recent times leading to the upsurge in number of victims.

**Regression Analysis Results**

The research used regression analysis to establish the linear statistical relationship between independent and dependent variable of this study. The hypothesis as stated in this study was tested using regression models.

**Test of Hypothesis: Supply Chain Responsiveness and Performance of HAOs**

A correlation analysis for the construct, supply chain responsiveness was conducted to find out how supply chain responsiveness correlated with performance of HAOs. Correlation coefficient can range from -1.00 to +1.00. The value of -1.00 represents a perfect negative correlation whereas that of +1.00 represents a perfect positive correlation. A value of 0.00 indicates absolute absence of a relationship between variables being tested (Akoglu, 2018). Table 3 shows that the Pearson correlation coefficient was 0.765. These findings indicate that there is a strong positive linear relationship between supply chain responsiveness and performance of HAOs.

**Table 3: Correlation Analysis for Construct Supply Chain Responsiveness**

Variables		Performance of HAOs	Supply Chain Responsiveness
Performance of HAOs	Pearson Correlation	1	.765**
	Sig. (2-tailed)		.000
	N	290	290
Supply Chain Responsiveness	Pearson Correlation	.765**	1
	Sig. (2-tailed)	.000	
	N	290	290

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

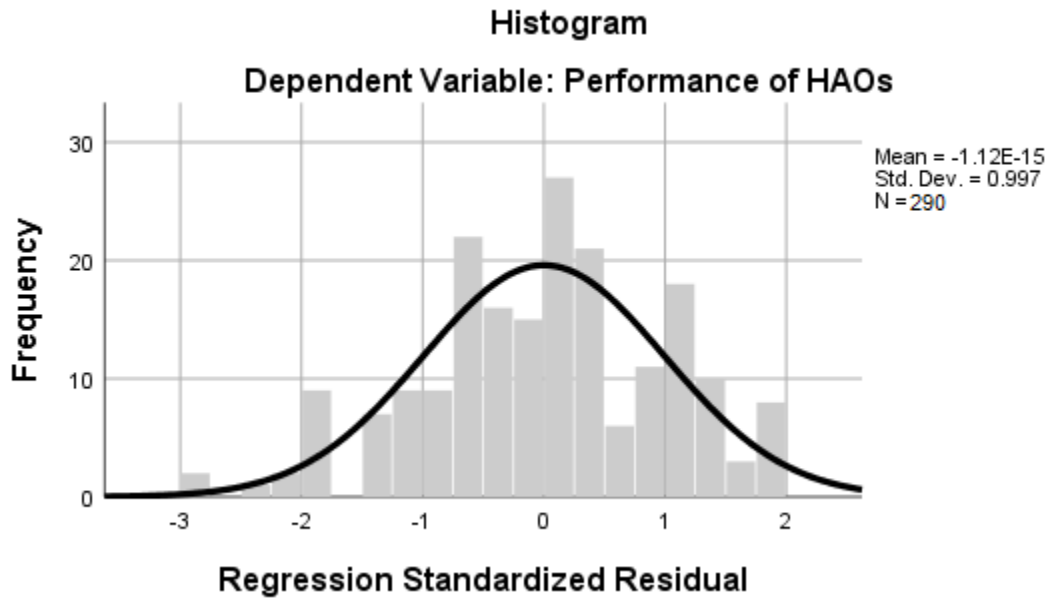
\* . Correlation is significant at the 0.05 level (2-tailed).

The researcher conducted regression analysis to examine the influence of supply chain responsiveness on the performance of HAOs. The hypothesis to test for this specific objective was:

**H<sub>0</sub>:** Supply chain responsiveness does not significantly influence the performance of humanitarian aid organizations in Kenya.

The histogram in figure 2 indicates that the data was normally distributed. The residual describes the error in the fit of the model to the *i*<sup>th</sup> observation *y<sub>i</sub>* and are used to provide information about the adequacy of the fitted model. According to Wogi, Wakweya and Tesfay (2018), 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.





**Figure 2: Histogram supply chain responsiveness on performance of HAOs**

The linear regression model shows  $R^2=0.585$  which means that about 58.5 percent of the total variance in the performance of HAOs in Kenya can be explained by supply chain responsiveness. The result is shown in Table 4.

**Table 4: Model Summary of Supply Chain Responsiveness**

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate
1	.765 <sup>a</sup>	.585	.579		.74484

a. Predictors: (Constant), Supply Chain Responsiveness

b. Dependent Variable: Performance of Humanitarian Aid Organizations

Further test on the ANOVA shows that the significance of the F-statistic ( $p < 0.05$ ) is less than 0.05 as indicated in Table 5. This is an implication that supply chain responsiveness has a significant influence on performance of HAOs.

**Table 5: ANOVA of Supply Chain Responsiveness**

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	7.439	1	7.439	12.099	.000 <sup>b</sup>
	Residual	177.081	288	0.615		
	Total	184.52	289			

a. Dependent Variable: Performance of Humanitarian Aid Organizations

b. Predictors: (Constant), Supply Chain Responsiveness

Presented in Table 6 are the coefficients and t-statistic of the resulting model. The constant term  $\beta_0 = 5.77$ , implies that if supply chain responsiveness is held constant, then there will be a

positive performance of HAOs in Kenya by 5.77. The regression coefficient for supply chain responsiveness was positive and significant ( $\beta_1 = 0.224$ ,  $p < 0.05$ ), with a t-value of 3.556. This implies that for every unit increase in supply chain responsiveness, performance of HAOs is predicted to increase by 0.224 units.

**Table 6: Coefficients of Supply Chain Responsiveness**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.770	0.477		12.101	0.000
	Supply Chain Responsiveness	0.224	0.063	0.765	3.556	0.000

a. Dependent Variable: Performance of Humanitarian Aid Organizations

$$\text{Performance of Humanitarian Aid Organizations} = 5.770 + 0.224 \text{ Supply Chain Responsiveness}$$

From the results in Table 3 to Table 6 above, the null hypothesis that supply chain responsiveness does not significantly influence the performance of humanitarian aid organizations in Kenya, is rejected. This result revealed that supply chain responsiveness contributes positively towards performance of HAOs in Kenya. The findings are in harmony with Jahre (2017) argument that humanitarian organizations operation in unstable environments necessitate strategies that enhance their responsiveness to the needs of vulnerable people. This calls for supply chain readiness, swift disposition of the needed resources, and capacity to cope proficiently in different settings. Sharing the same view are the extant researches (Ganguly, Padhy and Rai, 2017; Behl and Dutta, 2019; Agarwal, Kant and Shankar, 2019) which argued that the operational performance of humanitarian supply chains relies on their ability to respond swiftly to the needs of vulnerable populations and undertake dynamic operations. For this to be possible, humanitarian supply chains must be responsive, amenable and efficient. This is further supported by Munyoro (2020) findings that proper supply chain response to the humanitarian needs in case of disasters is considered to be mitigation and satisfying the initial and vital needs of the survivors. Thus, it ought to be done in the shortest time using the least amount of the resources to reduce the terrible effects of the disaster.

**Recommendations of the Study**

The 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 responsive supply chain. The study established that humanitarian aid organizations operate in a volatile, uncertain, complex and ambiguous environment due to changing needs of vulnerable people. To achieve and sustain a supply chain that is responsive to

the changing needs and volatile environment, the study recommends the need for organizations to design and implement a supply chain that incorporates lean and agility operation across the value chain.

In addition, humanitarian aid organizations are recommended to boost their supply chain responsiveness 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. Organizations need to deploy versatile digital supply networks to be ready to deal with the unexpected and unpredictable events that continue to unfold. The study also recommends the use of outsourcing, spare capacity and use of local suppliers to mitigate against humanitarian supply chain vulnerabilities.

The study recommends for a creation of a disaster preparedness plan that gives the way forward in times of tragedies or natural disasters. The study established that the culture of disaster preparedness in Kenya is lacking despite the increasing resource allocations for the same. It is paramount that Kenya stays prepared to minimize the effect of calamities on people and sources of livelihood. On the county level, the study recommends improvements such as subnational budget allocation and timely disbursement to guarantee better preparedness and a sturdier reaction. While responsibility has been manifested, crucial steps need to be taken to see to it that Kenya is prepared for any potential disasters to lessen their impact on people.

The study recommends to donors to build and strengthen the local capacity of the affected nations and populations to prevent, prepare for, alleviate, and contain humanitarian crises, with an aim of making sure that governments and societies can efficiently perform their obligations and coordinate effectively with humanitarian actors. This also includes promotion of local industries and local supplies increasing supply chain responsiveness in the event of global supply chain disruptions.

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