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Determinants of Supply Chain Performance among Non-Governmental Organizations in Mandera County

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Abstract

The purpose of this study was to assess the determinants of supply chain performance among NGOs in Mandera County. The study used descriptive research design. The target population was 72 respondents' three respondents from all the 24 NGOs in Mandera County. Since the population was small, census approach was adopted. The total respondents were 72 respondents. Primary data was collected and used. Descriptive statistics such as, mean and frequencies and inferential statistics (regression and correlation analysis) were used to perform data analysis. A multiple linear regression analysis model was used to test the hypotheses and link the variables. The findings indicated that the objectives; staff competence, information and communication, risk management process and infrastructural development were positively and significantly correlated with supply chain performance. The findings of this study are useful to the NGOs in Mandera County in their quest to ensure proper supply chain performance and improving the welfare of the residents.

Keywords: *Supply Chain Performance, staff competence, infrastructure development, risk management process, information and communication.*

1.0 INTRODUCTION

In today's highly competitive global environment, performance can no longer exclusively be determined by the decisions and actions that occur within a firm as the contribution of all members involved gives overall results of the supply chain (SC). The competition has changed from being between individual organizations to being between supply chains. As organizations form global alliances, it is essential that they understand how supply chain management (SCM) can be successfully implemented (Halldorsson et al. 2008). A supply chain consists of all stages involved which directly or indirectly fulfill a customer request. It's being is to satisfy customer needs and

in the process, to generate profits for itself. SC not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and the end users themselves.

Recently, many companies have realized the potential of SCM in their day to day operations. However, there are many companies which do not have enough insight for development of effective performance measures and metrics needed to achieve a fully integrated SCM. The reason is that they do not have the access to a balanced approach and a clear distribution between the metrics at strategic, tactical, and operational levels (Bhagwat & Sharma, 2007). And, what can't be measured can't be improved. Even though SCM is very pertinent subject today, yet there is no effective tool available to measure supply chain efficiency of NGOs organizations. Supply chain measurement is more like a qualitative statement unlike productivity or quality measurement, where the parameter can be measured objectively and expressed in a unit or in any ratio. Measuring supply chain performance (SCP) can assist in better understanding of the SC and improving its overall performance (Chen & Paulraj, 2004).

Supply chain management (SCM) approach is progressively recognized by many organizations as a strategy to attain their business goals today (Chin, et al., 2004; Altekar, 2005). It has become one of the new era for organizational sustainability and competitiveness (Gunasekaran, 2004). In this aspect, many companies have truly striving hard to achieve superior supply chain performance in order to outperform its competitors. Enhancing supply chain performance is a critical approach for achieving competitive advantages for companies (Cai, Liu, Xiao and Liu, 2009).

In Kenya, Supply chain management has been a major component of competitive strategy to enhance supply chain organizational productivity and profitability. Companies must always be concerned with their competition. Today's marketplace is shifting from individual company performance to supply chain performance: the entire chain's ability to meet end-customer needs through product availability and responsive, on-time delivery. Supply chain performance crosses both functional lines and company boundaries. Functional groups (engineering, R&D, manufacturing, sales and marketing) are all instrumental in designing, building, and selling products most efficiently for the supply chain. Traditional company boundaries are changing as companies discover new ways of working together to achieve the ultimate supply chain goal: the ability to fill customer orders faster and more efficiently than the competition (Gunasekaran, et al. 2001).

1.2 Problem Statement

NGOs operating in highly volatile areas in Kenya experienced poor supply chain management performance (Rodman, 2004). Mandera County is among volatile arrears in Kenya. Companies with poor supply chain performance experienced 33-40%, lower stock of returns. 70% to 80% of these companies' supply chains fail within 1-3 years (WB, 2013). The share price volatility in the year after the supply chain performance drop goes to 13.5% higher compared with volatility in the year before the disruption (Hendricks & Singhal, 2005). NGOs in supply chain affects the economic growth of the country (WB, 2013). Failure to deliver emergency supplies in case of a disaster such as famine or war increases the death rate and malnutrition. This affects the achievement of SDGs, vision 2030, legitimacy and public image of the NGOs because there seem to be ineffective organizations (Saad and Patel, 2006). The study assessed whether determinants

such as staff competencies, information and communication system, infrastructural development and risk management process caused these negating problems.

1.3 Study Objectives

i. To establish the effect of staff competence on the supply chain performance among NGOs in Mandera County.

ii. To examine the effect of information and communication systems on the supply chain performance among NGOs in Mandera County.

iii. To determine the effect of risk management process on the supply chain performance among NGOs in Mandera County.

iv. To establish the effect of infrastructure development on the supply chain performance of NGOs in Mandera County.

2.0 LITERATURE REVIEW

2.1 Theoretical Literature Review

2.1.1 System Theory

System theory was initiated in the 1950s by the biologist Ludwig von Bertalanffy and has been transferred from discipline to discipline (Skyttner, 2001). In SCM context, system theory brings together various components of a complex supply chain such as the human capital, information, materials and financial resources to form a subsystem which is then part of a larger system of supply chains or network. The theory argues that for a holistic perspective system theory must be employed to understand the internal and external factors that shape an organization's supply chain performance. Systems theory is one of the two most influential theories in SCM besides transaction cost theory. While the transaction cost theory was the dominant theory during the period of 1950-1970 (Heskett, Takeda, Sakata, and Matsushima, 1964), the systems theory has been the dominant theory from 1970 to the present time. However, it is important to note that during the period of 1970-1985 the focus of systems theory in SCM was on provision of an interface between different functions in organizations such as marketing, distribution, and production. However, the focus of systems theory has shifted to efficiency related issues, such as time-based management, lean production, costumer response efficiency, and the value chain concept (Gripsrud, Jahre and Persson, 2006).

General system theory provides a way to abstract from reality, simplifying the complex model while at the same time capturing its multi-dimensionality (Skyttner, 2001). Kilburg (1995) is one of the seminal authors who looked at the organizational supply chain from the systems perspective and identified the boundaries and major processes of organizational SC. It is important to note that the view of this theory toward the organizations is an open system perspective (Lowson, 2003). The application of systems theory in SC is mainly concerned with the determination of the domain

of SC, properties of the parts of the SC process, and promoting interrelationships among the parts of the system.

2.1.2 Theory of Constraints on Supply Chain

By far the most popular approach to supply chain management is Goldratt's Theory of Constraint (TOC) (Triestch 2005). The theory of constraints is a management paradigm that views any manageable system as being limited in achieving more of its goals by a very small number of constraints and as such TOC uses a focusing process to identifying the constraints and restructure it to realize more through put through the system (Triestch, 2005).

This is in line with the views of an earlier propagator of the theory of constraint, Mewes (1963), who identified bottlenecks as underlying inefficiencies of most processes. The theory of constraints is based on the premise that the goal achievement by a goal oriented system is limited by at least one constraint (Cox, Jeff, Goldratt & Eliyahu 1986). Only by increasing flow through the constraint(s) can overall output be increased and the objectives of the system realized (Goldratts, 2004). Assuming the goal of the system has been articulated and its measurement defined, the steps include identifying the systems constraint, deciding how to exploit the constraint, subordinate everything else to align the whole system and make changes (Goldratt 2004).

Constraints according to Noreen, smith &Mackey (1995) can be external or internal to the system and include such phenomenon as constraints of equipment, policy and regulation, lack of skilled people The theory of constraint has been used in the supply chain management to provide solution towards greater availability and flow of inventory by identifying constraints such as, and offering management techniques to reduce, replenishment time, lead time, and late deliveries (Herman 2000). Any improvements in such areas will improve availability of products and services to customer**.**

2.2 Empirical Review

Mbohwa (2010) discussed the challenges, difficulties and problems faced by NGOs in running logistics systems in Southern Africa, with a focus of some systems in Zimbabwe. Mini case studies of the operations of the World Health Organization (WHO), the International Red Cross Society and the Zimbabwe Red Cross Society, the World Food Programme, UNICEF and the Zimbabwean Civil Protection Organization were discussed. The research classified the challenges faced as lack of trained logistics personnel, lack of access to specialized humanitarian logistics courses and research information, the difficulty in using and adapting existing logistics systems in attending to humanitarian logistics and lack of collaborative efforts that address the area specifically. The study focused only on Zimbabwe and neighbouring countries.
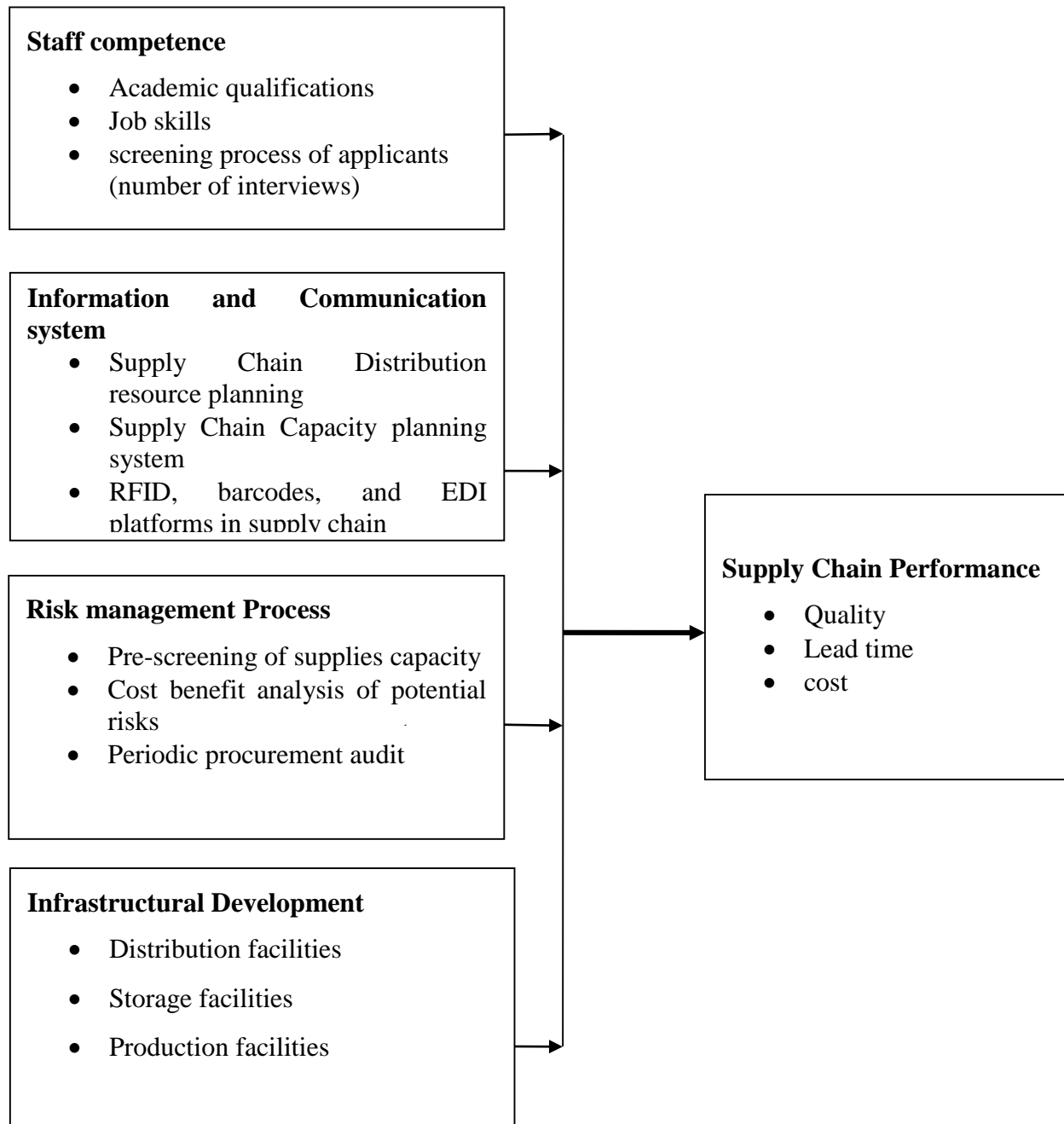
Mohamed (2012) conducted a study to establish SCM practices being implemented by humanitarian organizations in Kenya and their impact on performance. The study had three objectives; to establish SCM practices among humanitarian organizations in Kenya, to determine the relationship between supply practices and performance in humanitarian supply chain practices and to identify the supply chain challenges faced by humanitarian organizations in Kenya. The researcher adopted a descriptive research design. The population of the study included 28 humanitarian organizations operating in Kenya. The study findings indicated that maintaining a good supplier relationship, effective and efficient internal operations, continuous improvement, flexible production processes, use of technology to speed up humanitarian work, inter-organization

integrations and simplicity in internal operations are among the practices prevalent among humanitarian organizations in Kenya. The main challenges included customs and habits in the relief area, lack of financial resources, inability to anticipate disaster, bulky materials to be transported, demand and supply uncertainty. The study however did not prove an in-depth description of the possible solutions to overcome the supply chain challenges faced by humanitarian organizations.

Risk management has become a main part of the organization's activities and its main aim is to help all other management activities to achieve the organization's aims directly and efficiently". Hood and Young (2005) support this view, pointing to the UK public sector where, over the last decade, great emphasis has been placed on integrating risk management into the day-to-day management of national and local government bodies. According to Allen (2004), in a study on categorizing supply chain risks, the actual process of risk management normally begins by assessing two factors: firstly, the likelihood of specific events occurring; and secondly, the consequences should the events actually occur.

Rodman (2004) explored the use of SCM techniques to overcome barriers encountered by logistics management during humanitarian relief operations. Using grounded theory methodology, he analyzed barriers based on academic, organizational and contemporary literature. Rodman also identified possible solutions to the barriers identified from available SCM literature. His work married supply chain principles from different disciplines including private, non-profit and military sectors with an aim of benefiting humanitarian operations. The challenges identified by Rodman facing humanitarian operations included uncertainty, degraded infrastructure, communications, human resources and earmarking of funds. The results of the study put forth a framework of SCM solutions for overcoming logistics difficulties during relief operations and explain why managers should consider their use.

2.3 Conceptual framework

Staff competence

- Academic qualifications
- Job skills
- screening process of applicants (number of interviews)

Information and Communication system

- Supply Chain Distribution resource planning
- Supply Chain Capacity planning system
- RFID, barcodes, and EDI platforms in supply chain

Risk management Process

- Pre-screening of supplies capacity
- Cost benefit analysis of potential risks
- Periodic procurement audit

Infrastructural Development

- Distribution facilities
- Storage facilities
- Production facilities

Supply Chain Performance

- Quality
- Lead time
- cost

Independent Variable   Dependent Variable

Figure 1: Conceptual framework

3.0 RESEARCH METHODOLOGY

The study used descriptive research design. The target population was 72 respondents' three respondents from all the 24 NGOs in Mandera County. Since the population was small, census approach was adopted. The total respondents were 72 respondents. Primary data was collected and used. Descriptive statistics such as, mean and frequencies and inferential statistics (regression and correlation analysis) were used to perform data analysis. A multiple linear regression analysis model was used to test the hypotheses and link the variables. The linear multiple regression model was used to measure the relationship between the independent variables and the dependent variable which are explained in the model.

$$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where:

Y–Supply chain performance

β_0 – Constant

X_1 – staff competence

X_2 – information, communication and technology

X_3 – risk management

X_4 – Infrastructure

ε = Error term

In the model a is the constant term while the coefficient β_1 to β_4 are used to measure the sensitivity of the dependent variable (Y) to unit change in the explanatory variable (X_1, X_2, X_3, X_4). ε, is the error term which captures the unexplained variations in the model. The results are presented in form of tables, pie charts and graphs.

4.0 RESULTS AND DISCUSSIONS

4.1 Response Rate

The number of questionnaires that were administered was 72. A total of 68 questionnaires were properly filled and returned. This represented an overall successful response rate of 94.4% as shown on Table 1.

Table 1: Response Rate

Response	Frequency	Percent
Returned	68	94.4%
Unreturned	4	5.6%
Total	**72**	**100%**

4.2 Reliability of Pilot Study

The cronbach alpha was calculated in a bid to measure the reliability of the questionnaire. This was done by subjecting the five questionnaires to 5 NGOs groups that were randomly selected. All the variables were reliable since their cronbach alpha was above 0.7 which was used as a cut-off of reliability for the study. Table 2 shows the reliability results.

Table 2: Reliability

Variable	No of Items	Respondents	α=Alpha	Comment
Staff competence	5	5	0.988	Reliable
Information and Communication system	15	5	0.994	Reliable
Risk management Process	15	5	0.803	Reliable
Infrastructural Development	15	5	0.993	Reliable
Supply chain Performance	15	5	0.995	Reliable

4.3 Demographic Characteristics

4.3.1 Gender of the respondents

The population of this study consisted of 37 men and 31 females representing 54% male and 46% female
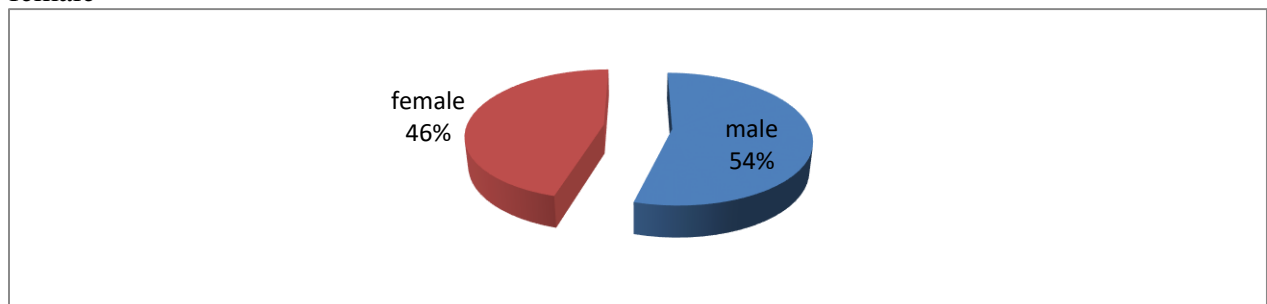

Figure 2: Gender of Respondents

4.3.2 Age of Respondents

From the results in Figure 3, majority of the respondents who was 50% were on age bracket of 30-39 years. 31% were on age bracket of 40-49 years, 10% were on age bracket 20-29 years while only 9% who were the least were above 50 years old. This implies that majority of the employees were middle age staff who were energetic and dynamic staff who are cable of delivering effectively and efficiently on supply chain performance.
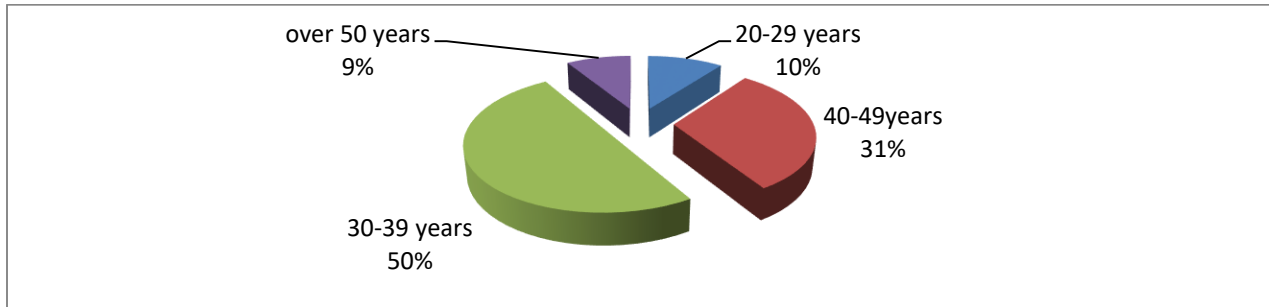
Figure 3: Age of Respondents

59% of the respondents and who were the majority had Degree graduate qualifications, 22% had masters' qualification, 13% had a college qualification while 6% of the respondents had phD qualification.
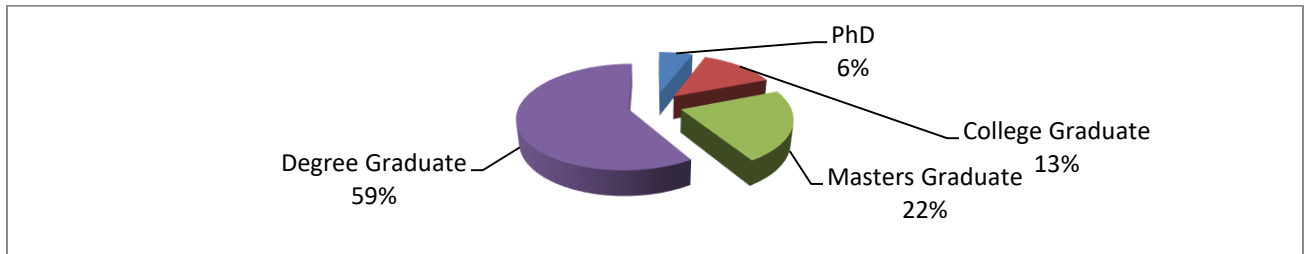
4.3.3 Level of Education

Figure 4: Level of Education

4.4. Descriptive Statistics

4.4.1 Staff competence

The first objective of the study was to establish the effect of staff competence on the supply chain performance among NGOs in Mandera County. Particularly, the study focused on the number of years in this profession, the highest level of education and the number of interviews conducted before a staff was employed (the screening process).
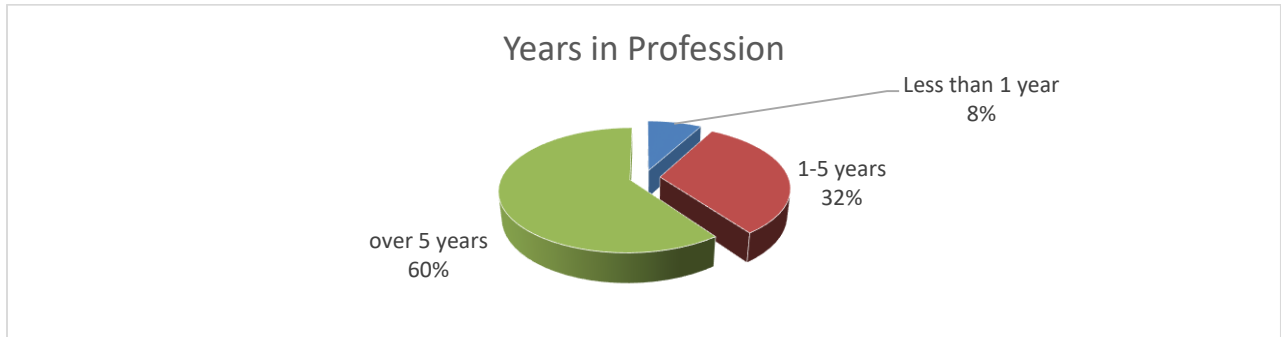
Figure 5: The number of years in profession

60% have been in the profession for over 5 years, 32% have been the profession for between 1-5 years, while 8% have been in the profession for a period less than less than 1 years. This implies that majority of the respondents have been in the employment for a good period of time therefore have experience
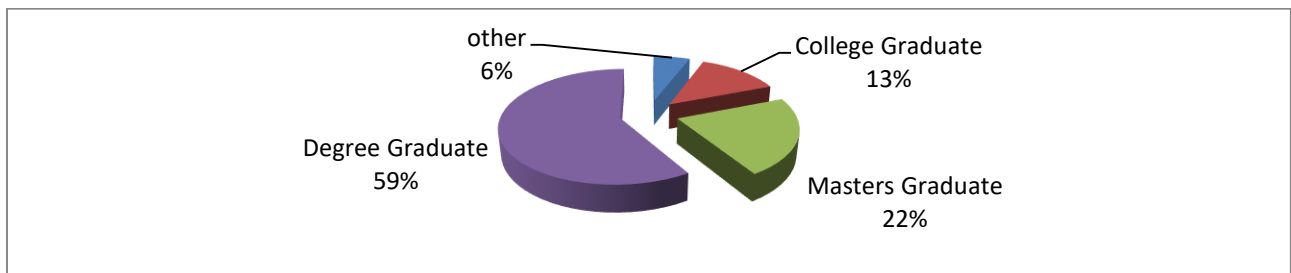
Figure 6: The highest level of education

59% of the respondents and who were the majority had Degree qualification, 22% had Masters Studies, 13% had Diploma qualification while 6% of the respondents had PhD qualification.

Table 3 Staff competence

Year	less than 2 interviews	btw 2and 3 interviews	4 more and interviews	Mean	Std. Dev
2011	4.4%	64.7%	30.9%	2.26	0.54
2012	5.9%	60.7%	33.4%	2.24	0.55
2013	5.9%	66.2%	27.9%	2.22	0.54
2014	7.4%	63.2%	29.4%	2.22	0.57
2015	7.4%	60.3%	32.4%	2.25	0.58
Average				**2.24**	**0.56**

According to results in Table 3, majority of the respondents who represented 64.7% of the respondents stated that between 2 and 3 interviews were conducted in the year 2011, 60.7% stated that there were between 2 and 3 interviews in 2012, 66.2% of the respondents stated that between 2 and 3 interviews were conducted in the year 2013, 63.2% of the respondents stated that between 2 and 3 interviews were conducted in the year 2014, while 60.3% of the respondents stated that between 2 and 3 interviews were conducted in the year 205. On a three-point scale, the average mean of the responses was 2.24 which mean that majority of the respondents stated that between 2 and 3 interviews we conducted, however, the answers were varied as shown by a standard deviation of 0.56. The highest of the mean was 3 while the lowest was 1. Therefore, average mean of the responses was 2.24 which means that majority of the NGOs in Mandera County conducts more than two interviews, as a method of screening personnel to work in supply chain. These results imply that outstanding implementation the staff competence is high among the NGOs.

4.4.2 Information and Communication System

The study sought to establish the effects of Information and Communication system on performance among NGOs in Mandera County.

In this study, Information and Communication System was measured by three questions focusing on Budget set for distribution resource planning system, capacity planning system and budget set for the purchase of RFID, barcodes, and EDI platforms. The respondents were asked to give their opinion regarding the budget sets. Specifically, they were asked to rate of 1 to 3 where 1= < Ksh 100,00, 2= Ksh 101,000-200,000 and 3= >Ksh 200,000.

Table 4: Budget set for distribution resource planning system

	<ksh100,000	ksh101,000-200,000	> ksh200,000
2011	7.4%	58.8%	33.8%
2012	4.4%	63.8%	33.8%
2013	10.3%	60.3%	29.4%
2014	8.8%	60.8%	30.4%
2015	7.4%	64.7%	27.9%

Majority of the respondents who represented 58.8% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 63.8% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 60.3% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 58.8% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2014, while 64.7% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for distribution resource planning system hence contribution in high information and communication system hence improving supply chain performance.

Table 5: Budget set for capacity planning system

	<ksh100,000 Row N %	ksh101,000-200,000 Row N %	> ksh200,000 Row N %
2011	8.8%	63.2%	27.9%
2012	10.3%	61.8%	27.9%
2013	10.3%	64.7%	25.0%
2014	10.3%	60.3%	29.4%
2015	10.3%	65.3%	24.4%

63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 61.8% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 64.7% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 60.3% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 65.3% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for capacity planning system hence contribution in high to information and communication system hence improving supply chain performance.

Table 6 Budget set for the purchase of RFID, barcodes, and EDI platforms

	<ksh100,000 Row N %	ksh101,000-200,000 Row N %	> ksh200,000 Row N %
2011	7.4%	60.2%	32.4%
2012	5.9%	61.8%	32.4%
2013	8.8%	60.8%	30.4%
2014	8.8%	63.2%	27.9%
2015	11.8%	67.6%	20.6%

60.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 61.8% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 60.8% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 63.2% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 67.6% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for the purchase of RFID, barcodes, and EDI platforms thus contribution highly to information and communication system hence improving supply chain performance.

4.4.3 Risk management process

The study sought to establish the effects of Risk Management process on performance among NGOs in Mandera County.

In this study, Risk management process was measured by three questions focusing on Budget set for prescreening of supplies capacity, conducting cost benefit analysis of potential risks, and Budget set for conducting periodic procurement audit. The respondents were asked to give their opinion regarding the budget sets. Specifically, they were asked to rate on 1 to 3 where 1= < Ksh 100,00, 2= Ksh 101,000-200,000 and 3= >Ksh 200,000.

Table 7 Budget set for prescreening of supplies capacity

	<ksh100,000	ksh101,000-200,000	> ksh200,000
2011	10.3%	63.2%	26.5%
2012	8.8%	60.2%	30.9%
2013	11.8%	64.7%	23.5%
2014	7.4%	61.8%	30.9%
2015	10.3%	58.8%	30.9%

63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 60.2% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 64.7% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 61.8% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 58.8% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for pre-screening of supplies capacity hence contributing in highly to risk management process hence improving supply chain performance.

Table 8 Budget set for conducting cost benefit analysis of potential risks

	<ksh100,000	ksh101,000-200,000	> ksh200,000
2011	5.9%	63.2%	30.9%
2012	13.2%	64.7%	22.1%
2013	7.4%	63.2%	29.4%
2014	8.8%	66.2%	25.0%
2015	13.2%	63.2%	23.5%

63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 64.7% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 66.2% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 63.2% of the respondents stated that between Ksh

101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for conducting cost benefit analysis of potential risks hence contributing in highly to risk management process hence improving supply chain performance.

Table 9 Budget set for conducting periodic procurement audit

	<ksh100,000 Row N %	ksh101,000-200,000 Row N %	> ksh200,000 Row N %
2011	4.4%	66.2%	29.4%
2012	11.8%	61.8%	26.5%
2013	8.8%	63.2%	27.9%
2014	5.9%	64.7%	29.4%
2015	13.2%	60.3%	26.5%

66.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 61.8% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 64.7% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 60.3% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for conducting periodic procurement audit hence contributing highly to risk management process hence improving supply chain performance.

4.4.4 Infrastructural development

In this study, Infrastructural development process was measured by three questions focusing on Budget set for maintenance of distribution facilities, Budget set for maintenance of storage facilities, and conducting maintenance of production facilities. The respondents were asked to give their opinion regarding the budget sets. Specifically, they were asked to rate on range 1 to 3 where 1= < Ksh 100,00, 2= Ksh 101,000-200,000 and 3= >Ksh 200,000.

Table 10 Budget set for maintenance of distribution facilities

	<ksh100,000	ksh101,000-200,000	> ksh200,000
2011	8.8%	63.2%	27.9%
2012	11.8%	69.1%	19.1%
2013	10.3%	60.3%	29.4%
2014	7.4%	64.7%	27.9%
2015	10.3%	63.2%	26.5%

63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 69.1% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 60.3% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 64.7% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for maintenance of distribution facilities hence contributing highly to Infrastructural development hence improving supply chain performance.

Table 11: Budget set for maintenance of storage facilities

	<ksh100,000	ksh101,000-200,000	> ksh200,000
2011	11.8%	58.8%	29.4%
2012	4.4%	64.7%	30.9%
2013	13.2%	61.8%	25.0%
2014	8.8%	64.7%	26.5%
2015	13.2%	66.2%	20.6%

58.8% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011, 64.7% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 61.8% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 64.7% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 66.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for maintenance of storage facilities thus contributing highly to Infrastructural development hence improving supply chain performance.

Table 12 Budget set for conducting maintenance of production facilities

	<ksh100,000	ksh101,000-200,000	> ksh200,000
2011	10.3%	63.2%	26.5%
2012	7.4%	61.8%	30.9%
2013	11.8%	60.5%	27.8%
2014	10.3%	58.8%	30.9%
2015	14.7%	60.3%	25.0%

According to results in Table 12, majority of the respondents who represented 63.2% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2011,

61.8% stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the 2012, 60.5% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2013, 58.8% of the respondents stated that between Ksh 101,00 and Ksh 200,00 was the budget set for the year 2014, while 60.3% of the respondents stated that between Ksh 101,000 and Ksh 200,00 was the budget set for the year 2015. This imply that NGOs in Mandera County sets a considerate amount of budget for Budget set for maintenance of production facilities thus contributing highly to Infrastructural development hence improving supply chain performance.

4.5 Hypothesis Testing

Regression analysis were performed by using the composites of the key variables to obtain F statistic.

Table 13: F statistic and P Value

Variable	F Statistic	sig
Staff Competence	55.912	**0.000**
Information and Communication System	55.507	**0.000**
Risk management Process	31.983	**0.010**
Infrastructural Development	58.617	**0.000**

The first objective of the study was to establish the effect of staff competence on the supply chain performance among NGOs in Mandera County. The null hypothesis was that Staff competence have no significant relationship on the supply chain performance among NGOs in Mandera County. The hypothesis was tested by using the F statistic. The acceptance/rejection criterion was that, if the calculated f-statistic is higher than the tabulated/critical f statistic the null hypothesis is rejected, further if p value is less than 0.05, the H0 is rejected. Results in Table 4.13 show that the the calculated f-statistic of 55.912 was higher than the tabulated/critical f statistic. The findings were further supported by p-value of 0.000. This indicates that the null hypothesis was rejected hence there is a significant relationship between staff competence and the supply chain performance among NGOs in Mandera County.

The second objective of the study was to establish the effect of Information and Communication System on the supply chain performance among NGOs in Mandera County. The null hypothesis was that Information and Communication System has no significant relationship on the supply chain performance among NGOs in Mandera County. The hypothesis was tested by using the F statistic. Results in Table 4.13 show that the calculated f-statistic of 55.507 was higher than the tabulated/critical f statistic. The findings were further supported p-value of 0.000. This indicates that the null hypothesis was rejected hence there is a significant relationship between Information and Communication System and the supply chain performance among NGOs in Mandera County.

The third objective of the study was to establish the effect of Risk Management Process on the supply chain performance among NGOs in Mandera County. The null hypothesis was that Risk Management Process has no significant relationship on the supply chain performance among NGOs in Mandera County. Results in Table 4.13 show that the calculated f-statistic of 31.983 was higher than the tabulated/critical f statistic. The findings were further supported p-value of 0.010.

This indicates that the null hypothesis was rejected hence there is a significant relationship between Risk Management Process and the supply chain performance among NGOs in Mandera County.

The fourth objective of the study was to establish the effect of Infrastructural Development on the supply chain performance among NGOs in Mandera County. The null hypothesis was that Infrastructural Development has no significant relationship on the supply chain performance among NGOs in Mandera County. Results in Table 4.13 show that the calculated f-statistic of 58.617 was higher than the tabulated/critical f statistic. The findings were further supported p-value of 0.000. This indicates that the null hypothesis was rejected hence there is a significant relationship between Infrastructural Development and the supply chain performance among NGOs in Mandera County.

4.5 Correlation Analysis

The correlation analysis results revealed that there was a positive and a significant relationship between staff competence and supply chain performance (r=0.677, p=0.000). The results indicated that there was a positive and a significant relationship between information and communication system and supply chain performance (r=0.676, p=0.000). The results also indicated that there was a positive and a significant relationship between risk management process and supply chain performance (r=0.571, p=0.000). Further the results showed that there was a positive and a significant relationship between infrastructural development and supply chain performance (r=0.686, p=0.000).

Table 14: Correlation analysis

Variables		Supply Chain Performance	staff competence	Information and communication systems	Risk management Process	Infrastructural development
Supply Chain Performance	Pearson Correlation	1.000				
	Sig. (2-tailed)					
staff competence	Pearson Correlation	.677**	1.000			
	Sig. (2-tailed)	0.000				
Information and communication systems	Pearson Correlation	.676**	.436**	1.000		
	Sig. (2-tailed)	0.000	0.000			
Risk Management Process	Pearson Correlation	.571**	.582**	.397**	1.000	.327**
	Sig. (2-tailed)	0.000	0.000	0.001		0.007
Infrastructural Development	Pearson Correlation	.686**	.477**	.599**	.327**	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.007	
** Correlation is significant at the 0.01 level (2 tailed).						

4.6 Regression Analysis

Table 15: Model Fitness for the Regression

Indicator	Coefficient
R	0.845
R Square	**0.714**
Adjusted R Square	0.695
Std. Error of the Estimate	0.321

The results presented in Table 15 present the fitness of model used in the regression model in explaining the study phenomena. Staff competence, information and communication system, risk management process and infrastructural development were found to be satisfactory variables in supply chain performance. This is supported by coefficient of determination also known as the R square of 71.4%. This means that Staff competence, information and communication system, risk management process and infrastructural development explain 71.4% of the variations in the

dependent variable which is supply chain performance. This results further means that the model applied to link the relationship of the variables was satisfactory.

Table 16: Analysis of Variance

Statements	Sum of Squares	df	Mean Square	F	Sig.
Regression	11.420	4	2.855	17.372	**.000**
Residual	21.364	67	.164		
Total	32.784	68			

Table 16 provides the results on the analysis of the variance (ANOVA). The results indicate that the overall model was statistically significant. Further, the results imply that the independent variables are good predictors of supply chain performance. This was supported by an F statistic of 17.342 and the reported p=0.00 which was less than the conventional probability of 0.05significance level.

Table 17: Regression of Coefficients

Variable	B	Std. Error	t	sig
(Constant)	0.177	0.171	0.684	0.497
Staff competence	0.230	0.070	3.310	**0.002**
Information communication	0.319	0.098	3.263	**0.002**
Risk Management	0.170	0.079	2.153	**0.035**
Infrastructural development	0.307	0.086	3.548	**0.001**

Regression of coefficients results in table 17 shows that staff competence has a positive and significant effect on supply chain performance (r=0.230, p=0.002). The table further indicates that information and communication system and supply chain performance are positively and significantly related (r=0.319, p=0.002). It was further established that risk management and supply chain performance were positively and significantly related (r=0.170, p=0.035). Infrastructural development had a positive and significant effect on growth performance r=0.307, p=0.001).

There the specific model before moderation is;

Supply chain Performance $=0.177+0.319X1 +0.307X2 +0.230X3 +0.170 X4$

Where X1 is Information communication system

  X2 is Infrastructural development

  X3 is Staff competence

  X4 is Risk management process

5.0 DISCUSSION CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion

The first objective of the study was to determine whether land fragmentation affected socio economic development of households in Kajiado North District. Results indicated that the size of land owned by households in Kajiado North District had decreased over time. The number of land owners and fenced properties had also increased. Land available for grazing on the other hand had decreased. The second objective sought to determine the effect of change of use land on socio economic development of households in Kajiado North District. Results indicated that households had changed the type of agricultural activities they undertook. The number of pastoralists had decreased while the size under crop farming had gone up. The respondents also noted that the real estate industry had grown in the area.

The third objective of the study sought to determine the effect of informal settlements on socio economic development of households in Kajiado North District. The study findings revealed that the number of unconventional dwellings like slums had increased in the area. The number of squatters in the area had also increased in the area and housing was inadequate. The fourth objective sought to determine how infrastructure development influenced socio economic development of households in Kajiado North District. Results revealed that the building of schools, dispensaries, roads, banks and shopping centers had improved the quality of life households in Kajiado North District. They also expected that the construction of the SGR was going to improve their quality life.

5.2 Conclusions

NGOs in Mandera County Various strategies to improve supply chain performance. They mainly use staff competence, information and communication systems, risk management process and infrastructural development to improve supply chain performance. The study concluded that staff competence is important for supply chain performance among NGOs. Having a competence staff ensure work is done in effective and efficient manner that will always enhance the performance of supply chain in NGOs. Disaster and crisis situations demand effective Information and communication strategies in NGOs. Information and communication is important for the support of humanitarian efforts in supply chain performance matrix. Further, the study concluded that Risk management process is major part of supply chain activities and its main aim is to help all management activities to achieve the performance aims directly and efficiently, integrating risk management into the day-to-day improves supply chain performance. Lastly, the study concluded that infrastructural development is a key determiner of performance in NGOs supply chain. Increase in infrastructural development positively leads to improvement of supply chain performance.

5.3 Recommendations

The study recommends that NGOs staff be qualified in supply chain issues to run the supply chain organizations effectively. The personnel involve in supply chain should be given corresponding supply chain related training. Continuous specific training of supply chain staff is imperative to maximize performance of NGOs. To further enhance performance in supply chain it is

recommended that NGOs must create information and communication system that is conducive to and supportive of quality implementation by personnel in supply chain. NGOs should make bold decisions when faced with uncertainty on information communication systems and innovate to maximize performance. Based on the findings and conclusions, the study recommends for NGOs to focus mostly on risk management, setting potential risks reduction strategies is a significant component of the supply chain performance improvement. By setting the risk management procedures NGOs will improve supply chain performance greatly. The study also recommended that NGOs should put in place infrastructural development to aid performance improvement. Infrastructural development is a key determinant in supply chain performance.

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