



THE ROLE OF SUPPLY CHAIN INTEGRATION ON PERFORMANCE OF SELECTED INTERNATIONAL HUMANITARIAN ORGANIZATIONS IN ETHIOPIA

**A THESIS SUBMITTED TO THE ADDIS ABABA UNIVERSITY SCHOOL OF
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Declaration

I, hereby, declare that this thesis, THE ROLE OF SUPPLY CHAIN INTEGRATION ON PERFORMANCE OF SELECTED INTERNATIONAL HUMANITARIAN ORGANIZATIONS IN ETHIOPIA, is my original work and has never been presented for a degree in any other university and that all sources of materials used for this thesis have been duly acknowledged.

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This research project has been submitted with my authority as the university Advisor;

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LISTS OF ABBREVIATIONS AND ACCRONYMS

BPR Business Processing Reengineering ERP-Enterprise Resource Planning

CRS	Catholic Relief Services
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HO	Humanitarian Organization
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HOs	Humanitarian Organization
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HSC	Humanitarian Supply Chain
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HSCI	Humanitarian Supply Chain Integration
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HSCM	Humanitarian Supply Chain Management
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HSCOs	Humanitarian Supply Chain Organizations
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ICT	Information Communication Technology
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INGOs	International Non-Governmental Organizations
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IOM	International Organization for Migration
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MRPII	Material Resource Planning
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NGO	Non-governmental Organization
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NT	Network Theory
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OCHA	Organization for Coordination of Humanitarian Affairs
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SC	Supply Chain
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SCC	Supply Chain Council
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SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference
SCPM	Supply Chain Performance Measurement
SCPMS	Supply Chain Performance Measurement System
SPSS	Statistical Package for Social Sciences
UNHCR	United Nations Humanitarian Commissioner for Refugees
WFP	World Food Program

Abstract

Supply Chain integration is considered as one of the ways through which humanitarian organizations can be more competitive to achieve their goals and thus better perform. This research aimed at measuring the role of supply chain integration on performance of selected international humanitarian organizations operating in Ethiopia. Firstly, it aimed at exploring current level of supply chain integration practices that exist across humanitarian supply chains in Ethiopia. Secondly, examined the impact of supply chain integration on performance of humanitarian organizations in Ethiopia. Supply chain integration was defined and analysed in terms of three dimensions of Inter-organizational information integrations, Inter-organizational resource sharing & coordination and Intra-organizational internal Process Integrations. Today's humanitarian supply chains, due to challenges posed by the steadily increasing number of complexities in the environment they operate, tend to be unstable, uncertain, less responsive, inefficient and ineffective. These problems with the humanitarian supply chain were the triggering factors that initiated undertaking of this study. A structured questionnaire was developed, and primary data gathered from a purposively selected sample of 36 respondents from major six international humanitarian organizations which conduct Supply chain and logistics activities as their core businesses. Pearson Correlation was used to understand and analyse the first objective, whereas regression analysis was used to analyse the relationship between SCM integration and organizational performance. Multiple linear regression model was adopted to predict organizational performance from the three supply chain integration dimensions. The study established that most HOs practiced SC integration practices among one another and between their own functions. The findings also revealed that there is very significant relationship between SCI and organizational performance and all the SCI variables account for 78.6 % of the variation in the performance of humanitarian organizations. All the three independent variables were statistically significant with p-value of less than 0.05. It is recommended that all humanitarian organizations should embrace all the three dimensions of supply chain integrations practices to enhance their organization overall performances. Further research is recommended through inclusion of other supply chain operators such as beneficiaries, governments institutions, private companies and donor agencies as units of analysis.

Key Words: *Performances of Humanitarian Organizations, Humanitarian Supply Chain, Humanitarian Supply Chain Integrations, Information Integrations, Resource sharing and Coordination, Internal Process Integrations.*

CHAPTER ONE: INTRODUCTION

This Chapter covers units such as background of the study, problem statement, objectives of the study, research questions, significance of the study, and scope of the study, limitations and organization of the study.

1.1. Background of the Study

Since its introduction in the early 1980s (Oliver and Webber, 1982), supply chain management (SCM) has become one of the most popular concepts within management (La Londe, 1997). Studies have articulated that the integration of supply chains is vital concept for organizations' strategic as well as operational importance (Zailani and Rajagopal, 2005). Researchers like Gimenez and Ventura, (2005) have stressed that the more the integration the better.

The world is experiencing a steadily growing number of natural disasters since 1960(EM-DAT 2015) causing an increased severity in terms of individuals injured or killed as well as the scale of the financial impact of these events (Tatham and Hughes 2011). The numbers of catastrophes are increasing and consequently also the need for humanitarian supply chain (Kovács & Spens, 2011).

The situation is also similar for Ethiopia which suffers from long-standing conflicts driven by ethnic motives, competition for scarce resources, land issues, limited social services, infrastructure and weak governance. Inter communal violence has in recent years resulted in the displacement of some 2.7 million people, of whom 1.4 million people were displaced in the first six months of 2018 alone, making it the world's highest level of internal displacement in 2018 (SIDA, 2019).

Natural and manmade disasters are the cause of human suffering in Ethiopia. Populations in the country frequently experience recurrent drought, seasonal flooding, intercommunal conflict, food insecurity, disease outbreaks, and limited access to health and hygiene services, contributing to sustained humanitarian needs and an on-going complex emergency.

The United Nations Office for Coordination of Humanitarian Affairs (OCHA) has reported that, in 2018, Ethiopia faced a significant spike in conflict-induced displacement. Even though drought-related relief food needs have decreased due to the overall good seasonal rains received during the year, the relief food requirement is still significantly high due to new needs

resulting from increasing conflict-induced displacement and internally displaced people returnees. Many communities affected by drought in recent years have also yet to recover and, having exhausted their coping capacity, they still remain highly vulnerable to shocks.

Humanitarian organizations are highly important to efficiently provide aid to those people in need. Supply Chain Management is central to success of Humanitarian aid because it is crucial to the speed and effectiveness of response, and because it accounts for a major part of the cost of aid agencies (Pettit, S. J., & Beresford, A. K. C. (2009).

Due to the ever-increasing global competition around the world, organizations to sustain in business, are continuously seeking for new ways of doing business. Researchers call for a systematic approach to supply chain integration (SCI) and emphasized on the need for cooperative and mutually beneficial supply chain partnerships (Lambert, Douglas, Cooper and Martha, 2000) and the joint improvement of inter-organizational processes (Zhao, X., Huo, B., Selen, W. & Yeung, J.H.Y., (2011). Elmuti D., W. Minnis, and M. Abebe (2008) also articulated the importance of the close relationship between the performance of firms and their supply chain integration.

For humanitarian supply chains to function with success there is a need for strategies to guide the operations. Since humanitarian organizations usually operate in unpredictable and volatile environments, flexibility of resources and coordination is essential, this to be able to deliver aid to where it is needed and further as quickly as possible (Mason-Jones, Naylor & Towill, 2000).

The need for SCM integration has thus resulted from the need to make organizations more responsive to reduce operational costs and to ensure that each functional activity is linked with others so that the flow of information can be faster and efficient. It also includes coordination and collaboration with channel partners.

SCM integration is therefore one of the ways through which humanitarian organizations can be more competitive to achieve their goals and thus better perform.

1.2. Statement of the Problem

The world faces many structural problems like hunger, lack of proper sanitation and displacement (Van der Laan, Brito and Vergunst 2009, 23). Therefore, the global demand for humanitarian assistance is rising and will continue to rise (Christopher and Tatham 2011, 1; Thomas and Kopczak 2005, 1).

Despite the growing humanitarian need, the humanitarian supply chain is challenged by different complexities. Among the complexities being; raising freight cost, inaccessibility, increased risk of losses, limited resources & competitive environment, constrained food supply among others, the increased need for accountability by donors and supply chain situations which are unpredictable, turbulent, and requiring flexibility, ((Oloruntoba and Gray, 2006) because of complex environments due to the disasters that occur anywhere and anytime, unfortunately often in underdeveloped countries with poor infrastructure or political instability (Scholten et al. 2010).

Thus, to overcome these complexities, key success factors are essential to achieve efficient and effective supply chains, to fulfil the donor and beneficiary demands as wells as service requirements and to generate competitive advantages.

However according to McLachlin et al. (2009), Humanitarian Supply Chains tend to be unstable, prone to political and military influence, and inefficient due to lack of joint planning and inter-organizational collaboration.

With regards to the humanitarian supply chain situations in Ethiopia the U.S. Agency for International Development report shown that given Ethiopia's large size and the expansive scope of its health programs, its public health supply chains are complex. These supply chains involve the participation of a variety of players, levels, and functions. A 2004 national assessment of the existing public health pharmaceutical supply system identified a number of challenges in the supply chain. These challenges demonstrated that linkages between entities in the supply chain were broken or missing, contributing to poor performance. For example, the responsibilities of actors within the supply chain were unclear. The supply chain had multiple levels, requiring products and information to flow through numerous channels, leading to long lead time. Furthermore, there were non-value-adding activities at every level of the supply chain, leading to duplication of certain tasks and gaps in other areas, as well as confusion about roles. Procurement was fragmented at various levels of the supply chain, leading to lack of coordination that resulted in overstock in some regions, under stock in others, and fragmented,

small-scale procurement rather than coordinated, pooled procurement. In addition, lack of coordination between players in the pharmaceutical logistics systems hindered the sharing of information.

Therefore, addressing the above mentioned existing humanitarian supply chain problems entails the need for Humanitarian Organisations in Ethiopia to realize and fully understand SCM integration and its impact on their performance and delivery for the donor and to the beneficiaries. Research in supply chain performance in the context of humanitarian logistics is an important field to put future research on.

On the other hand, despite of the growing humanitarian need, the study of humanitarian supply chain management has not been widely developed and there is little published work increasing understanding about the nature of supply chain management for humanitarian aid organizations.

Recently researchers have studied about the impact of integration on performance. According to Alexis UWAMAHORO (2018) supply chain integration influences the performance of businesses. The study concludes that supply chain integration is a critical ingredient for improving firms' business performance. However, the findings are limited to the manufacturing and sector organizational performance.

Binyam Gizaw (2016) in his study also found that there is a strong and positive relationship among the four supply chain integration dimensions and operational performance of Ethiopian Trading Enterprises. But the study focused on the business sector only.

Jasmine Siu's study (2013) has examined the benefits obtainable by liner shipping companies and the barriers to supply chain integration theoretically and empirically. In general, it is found that the level of supply chain integration is positively related to supply chain value.

However, the different literatures available have shown that a larger part of scientific research is made about the relationship between Supply chain integration and performance within the field of commercial sector and therefore, a gap can be identified within in humanitarian sector. And thus, in spite of the, very few studies with regards to the humanitarian context, this study aimed at examining and exploring the role of humanitarian supply chain integration on performance of selected aid agencies Ethiopia.

Reviewed literatures during this study confirmed also that there is little research and knowledge contributed which applies for the local context. Thus, this study was intended to explore further on the subject in the context of humanitarian organizations in Ethiopia.

Besides, significant number of publications revealed to have used internal integration variables within an organization to measure performance instead of including effects of inter-organizational integration/collaboration on performance of the whole humanitarian actors involved in the Supply Chain network. Most of the studies inclined to have focused on measuring performance of individual humanitarian organizations rather than the performance of all actors involved.

This study, therefore, attempted to bridge the aforementioned gaps by examining the relationship that exists between humanitarian supply chain integration and organisational performance in selected HOs Ethiopia.

1.3. Research Questions

Based on the research background and motivation this research attempted to address the following questions.

- What is the current level of SCM integration practices within humanitarian organizations in Ethiopia?
- What are the relationships between supply chain integration and the organizational performance?
- What are the roles of SCM integration on the performance of humanitarian organizations in Ethiopia?

1.4. Research Objectives

In response to the above research questions the associated research objectives the study aimed to answer are:

1.4.1. General Objective

The objective of the study is about to analyse the roles of supply chain integration on organizational performance in selected international humanitarian organizations operating in Ethiopia.

1.4.2. Specific Objectives

The specific objectives of this study include;

- i. To determine the extent of SCM integration within humanitarian organizations in Ethiopia with respect to dimensions of supply chain integration (inter-organizational and intra-organizational dimensions)
- ii. To determine the relationship between SCM Integration and the performance of humanitarian organizations in Ethiopia.
- iii. To assess the roles of SCM integration on organizational performance of the selected humanitarian organizations.

1.5. Significance of the Study

This research paper provides an opportunity for humanitarian organizations to recognize the gap in humanitarian Supply chain effectiveness and its potential impact in the aid process.

This study is expected to add knowledge to the fields of supply chain management and operational performance by highlighting the interrelationship between these variables.

Further this research paper can serve as a reference material either to students or researchers who want to undertake further researches on the same or related topics in future.

1.6. Scope of the Study

The study concentrated on the effects of SCM Integration of performance of selected HOs in Ethiopia. This study is conducted among the humanitarian organizations in Addis Ababa, Ethiopia. The study specifically covered the integration among the humanitarian supply chain management (HSCM) of Humanitarian Organizations who have been implementing interventions related to emergency relief food assistance programs in Ethiopia. Which means the study did not consider other commercial supply chain actors, donor agencies, and government institutions and ultimate beneficiaries.

The study solely focused on impact of integration on performance of HSC and which obviously did not mean to address the effect of all other SCM practices for performance of NGOs operations in Ethiopia.

1.7. Limitation of the Study

The study and its application thereof may not be applicable directly to other organizations operating outside Ethiopia. It is therefore important to note that it can only be used for comparative purposes and not any direct application in any other geographical locations.

1.8. Organization of the Research

This study report is organized into five chapters.

Chapter one is on introduction. It also covers units such as background of the study, problem statement, objectives of the study, research questions, significance of the study, and scope of the study, limitations and organization of the study.

The second chapter deals with review of related literature concerning the study.

The third chapter deals with an explanation of the research process and the methods adopted for collecting and analysing data. It focuses on description of the study area, research approach, research design, population and sample data source and type, data collection procedure, reliability, validity and ethical consideration.

Chapter four focuses on the data analysis and interpretation in relation to the research objectives and research questions of the study.

Chapter five presented the summary part. The findings of the research the conclusions and recommendation for future studies are discussed.

2. CHAPTER TWO: LITERATURE REVIEW

This chapter deals with theoretical literature review, empirical literature review and conceptual framework in detail.

This section discusses theories and models on which the study is anchored. Specifically, supply Chain Management, SCOR Model, The three-echelon theoretical framework for supply chain integration, Network theory in Supply Chain Management and Stakeholder theory in Supply Chain Management. The researcher used each models and theories to determine both dependent and independent variables, develop conceptual frameworks and design data collection instruments.

2.1. Theoretical literature review

This section discusses theories and models on which the study is anchored. Specifically, Supply Chain Management, Supply Chain Operations Reference (SCOR) framework, The three-echelon theoretical framework for supply chain integration, Network theory in Supply Chain Management and Stakeholder theory in Supply Chain Management. The researcher used each models and theories to determine both dependent and independent variables, develop conceptual frameworks and design data collection instruments.

2.1.1. Supply Chain Management Theories

According to (F. A. Garcia, M. G. Marchetta, M. Camargo, L. Morel, and R. Q. Forradellas 2012) there are various publications pertaining to supply chain performance measurement with a number of approaches, with different objectives and contexts. The balance scorecard is a widely used framework on performance measurements by incorporating multiple relevant attributes together (Kaplan and D. Norton 1992). Bhagwat and Sharma (2007) also applied the balanced score card to supply chain management, which provides a quantitative perspective of the dynamics of the distribution logistics chains by dashboards.

2.1.2. Supply Chain Operations Reference (SCOR) framework

SCOR is developed by the Supply Chain Council (SCC) to evaluate the overall effectiveness of a supply chain. It is a reference process model for supply chain management, which provides a framework that links business process, metrics, best practices and technology features into an integrated structure. SCOR is the most common model to describe supply chains using a common set of definitions and can be used in various types of organizations. The model spans

from a supplier's suppliers to a customer's customers. It describes the business activities required to satisfy customer demand and provides a basis on how to improve business processes. It uses benchmark and best practice data to prioritize the supply chain activities, quantify potential benefit of specific process improvement, and determine financial justifications (J. Cheng, K. Law, H. Bjornsson, A. Jones, and R. D) 2010. SCOR integrates the business concept of process re-engineering, benchmarking, and measurement into its framework (S. Huan, S. K. Sheoran, and G. Wang 2004). It covers all customer interactions (order entry through paid invoice), all physical material transactions (supplier's suppliers to customer's customers, including equipment, supplies, spare parts, bulk products, software, etc.) and all market interactions (from the understanding of aggregate demand to the fulfilment of each order). It does not attempt to describe every business process or activity. The corresponding performance attributes in SCOR model are reliability, responsiveness, agility, costs, and asset management. SCOR defines reliability as the performance of supply chain in delivering, correct product as the correct time, in the correct condition and quantity, with the correct documentation, and to the correct customer. Responsiveness refers to the speed at which a supply chain provides products to the customer, and agility is the ability of a supply chain in responding to market changes.

2.1.3. The three-echelon theoretical framework for supply chain integration

Yanfang Huo¹, Xinyue Jiang¹, Fu Jia² and Bingguang Li³ 2008 established a framework in order to integrate supply chain effectively, based on the comprehensive hierarchical planning framework, a theoretical framework for supply chain integration. According to the framework, the key relative techniques can be sorted into three echelons based on the rules from entity objectives to relative objectives and from basic capabilities to advanced capabilities- the basic operations management level, the planning and controlling level and the strategic management level.

- A. *The integration in operations management level:* The supply chain operations level involves the whole process from the material acquisition to order fulfilment, which is the physical level and basic elements of supply chain. The supply chain integration must begin with the integration of this level, which is the basis of collaboration between all the firms. According to the organizations and the functions, the integration in the operational management level includes internal integration of the focal manufacturer, the supplier integration, the distributor integration and the customer integration.

- B. The integration in planning and controlling level:* The excellent operation needs the support of integrated planning and performance evaluation, which involves the utilization of multiple techniques to plan, control, assess and improve performance. The integration in planning and controlling level coordinates all the business processes, esp. source, make, order fulfilment and inventory replenishment by information utilization and coordination. The core competencies in this level involve: databases, which enable the members to share necessary information; transaction system, which can initiate and deal with inventory replenishment and customer order fulfilment. Besides, it is vital to form the capability relevant to internal communication and collaborative operation. IT-based CPFR strategy is helpful to forming the core competencies. Meanwhile, it is also vital to monitor the business process through performance evaluation and improve the integrated performance continuously. Therefore, the key elements in planning and controlling level can be summed up as IT-based CPFR strategy and performance evaluation.
- C. The integration in strategic management level:* Out of question, successful supply chain integration needs partnership and management skills to maintain the partnership, while the skills always come from unique organization culture which the basis of partner selection is and maintaining. Thereby partnership maintaining, and cultural adaptation are the two kernel elements in strategic management level.

So as to ensure that core competencies are integrated well with support capacities, the focal firm can coordinate four kinds of flows- product/service flow, knowledge flow, information flow and fund flow – to produce value.

- A. The product/service flow* refers to the serials of value-adding activities of product/service from material acquisition to end customers. The values add to the product when the product flows along the supply chain and experiences physical changes, packaging, launch, customization, service support and other relative activities until meet the needs of end customers.
- B. The knowledge flow* is a reverse flow from end customers to suppliers. It always involves the exchange information about sales mode and product description, such as the customization requests, POS data, consumption information of end customers, warehouse and shipment information, etc. The information is vital to supply chain planning because it is helpful for the members to know the sales status well and then

reach consistent understanding on customer requirements and consumption status. On the basis, better plans are formulated, and the supply chain can work collaboratively.

- C. *The Information flow* is a kind of inter-communicational flow between supply chain members. The information always includes forecast information, promotional plan, purchase order, order confirmation, shipment and inventory information, invoice, payment and replenishing requirements, etc. The information exchange can trigger, control and record the flow of product/service. With the ICT development, more and more information is exchanged by EDI and network instead of paperwork.
- D. *The fund flow* always moves against the value-adding activities. Capital turnover and return on assets are the two main financial metrics which are of great importance to the supply chain performance.

2.1.4. Network theory in Supply Chain Management

According to Halldorsson (2007), Network theory aims to understand how personal chemistry between supply chain parties can influence trust building and long-term commitment. In the theory, direct communication is perceived as an enabler for building unique relationships, which could result in customization of the supply chain to meet the unique customer demands (Halldorsson, 2007). According to the Network Theory (NT) the networks of the firm are developed through two types of interactions: exchange processes of information and goods, and adaption of these processes such as legal, logistical and technical (Halldorsson, 2007). These interactions enable the parties in the network to establish mutual trust (Halldorsson, 2007). Commonly NT has been used as a descriptive tool to map capabilities of the supply chain such as its activities, members and resources (Halldorsson, 2007).

2.1.5. Stakeholder theory in Supply Chain Management

The shift towards pleasing all the stakeholders rather than increasing shareholder value is under discussion within academia and industry leaders (Sajjad et al., 2015; Park-Poaps and Rees, 2010; Huq et al., 2016, Co and Barro, 2009). Managing and aligning stakeholders' interests require new understanding and strategic analysis. For this purpose, the stakeholder theory was established (Phillips, 2003). Originally, stakeholder theory was established for strategic management discipline to emphasize ethics and morals in decision-making, unlike other

theories in strategic management (Friedman and Miles, 2006). In essence, stakeholder theory is concerned with the interest and well-being of the organization's stakeholders (Phillips, 2003). In this context, stakeholder refers to anyone, who can influence a company's success positively or negatively (Phillips, 2003). For supply chain management, a sustainable supply chain has been the goal because of increased demand by consumers (Padhi, 2018). Despite the implicit purpose of gaining visibility and good reputation through marketing a business as sustainable, supply chain managers have become more aware of their suppliers' business practices. In this situation, stakeholder theory can be applied to better understand the dynamics of different stakeholders within the supply chain. While Freeman introduced the stakeholder theory concept in 1984, Donaldson and Preston in 1995 classified stakeholder theory into three categories normative, descriptive and instrumental approaches (Friedman and Miles 2006, p.18-30). The theory suggests that when the density of the network increases, referring to improved communication and connectedness between network parties, shared behaviours and expectations increase. Thus, there is increased chance that the network can constrain the focal organization (Friedman and Miles, 2006, p.97-98). In order to avoid the possible constraints, the position of the organization plays a key role (Friedman and Miles, 2006, p.97-98). When the organization possesses higher centrality in the supply chain, it has more power over the parties. The power over the network (centrality) is gained not through individual qualities of the organization but through the number of ties within the network (centrality), closeness as independent access to others as control over others (Rowley 1997).

Humanitarian aid involves a growing and complex plethora of actors and agencies from the civil, business and military sectors (Oloruntoba & Gray 2006). As identified by Thomas and Kopczak, (2005) humanitarian logistics, as well as business logistics, encompass a range of activities including preparedness, planning, procurement, transport, warehousing, tracking and tracing and customs clearance. This presupposes a sophisticated coordination of activities to carry out the primary mission of humanitarian aid – delivery of product and/or service to the end user, whose immediate and longer-term survival may depend upon efficient completion of logistics and supply chain operational activity up to and including the crucial 'last fifty metres'.

2.2. Empirical Literature Review

This section of the chapter focuses on the literature review as conducted by the researcher. It includes a review of the various studies that have been conducted by other researchers relating roles of Supply Chain Integration on Performances of Humanitarian Organization subjects.

Supply Chain Management, humanitarian supply chain management, supply chain performance measurements, SCM integration in humanitarian aid, performance measurement within supply chain, measure in supply chain performance and Performance measurement of Humanitarian Organizations.

2.2.1. Supply Chain Management

Supply chain management is a discipline that integrates multi-functional approach to manage activities that not only concern single company, but across supply chain dimensions (Halldorson, Hsuan and Kotzab, 2015). According to Gunasekaran and Kobu (2007) Supply chain management (SCM) is an essential part of strategy for gaining a competitive advantage that enhances the profitability and efficiency of the organization. The main elements in SCM are designing the supply chain structure and the management of the supply chain, including managing relationships with other relevant organizations (Halldorsson et al., 2015).

2.2.2. Humanitarian Supply Chain

Several scholars propose that humanitarian supply chains consist of a wide range of actors such as governments, non-governmental international organization, donors, suppliers, end beneficiaries, local non-profit organizations, military and private actors (Haavisto and Goentzel, 2015; Kovacs and Spens, 2007; Tabaklar et al., 2015; Beamon and Balcik, 2008; Ergun et al., 2014). Humanitarian supply chains share common characteristics such as operating in uncertain environment, sudden massive demand and lack of resources. Beamon and Balcik (2008) suggest a framework for humanitarian supply chain that consists of the processes: assessment, procurement and shipping.

2.2.3. Humanitarian Supply Chain Integrations

(Seybolt, 2009) coordination of efforts between actors in a humanitarian and/or disaster relief have been challenged due to characteristics of humanitarian aid environment as it is large, highly complex, differentiate, unstable, and moderate connectivity. Extreme demand and supply uncertainty is another obvious barrier to build relationship with other actors in the humanitarian aid field (Van Wassenhove, 2006). There is argument over the importance of

coordination to consider among key critical factors driving organization success which enhance the delivery performance (Pettit & Beresford, 2009). However, the literature reveals poor coordination between humanitarian as an explanation for performance gaps (Mbohwa, 2006; McLachlin & Larson, 2011). In particular, prior related literature reveals the coordination challenges along with the humanitarian supply chain due to numerous factors, such as existence of different random actors in the humanitarian aid network (e.g. Jahre, Jensen, & Listou, 2009; Kovács & Spens, 2007), asymmetry information among the actors (Carroll & Neu, 2009), lack of clear command and control as well as rapidly changing priorities (McLachlin & Larson, 2011). Consequently, the outcome of such poor coordination has significant negative effect in terms of both economic and social values. (Sangiamkul & Hillegersberg, 2011; Van Wassenhove, Martinez, & Stapleton, 2010), oversupply and/or redundancies (Besiou, Stapleton, & Van Wassenhove, 2011; Ergun et al., 2010) can result to non-efficient delivery of supply to the affected people (or beneficiaries).

Recently, the importance of building permanent and temporary network in a disaster along with supply chain has been considered in literatures. For example, Jahre et al. (2009) develop a model revealing the creation of humanitarian permanent network during the preparedness phase of disaster by developing collaboration to relevant actors in supply network, designing structure, and building knowledge for recombination of resources (Jahre et al., 2009). In addition, they postulated the developing temporary humanitarian network during response phase including activities such as; setting up an operation drawing resources from multiple permanent organizations, mobilizing actors within supply network locally and internationally, and recombining resources.

In general, since the last decade several academic researches (e.g., Fabbe-Costes, Jahre, & Rouquet, 2006; McLachlin & Larson, 2011; Van Wassenhove, 2006) and non-academic researches have been conducted highlighting the importance of inter-organizational coordination between the involved actors (e.g., UN agencies, NGOs, and government). More specifically, coordination mechanism under one umbrella organization has continuously noted as major contributing factors from previous literature in a humanitarian context (Balcik et al., 2010; Tomasini & Van Wassenhove, 2009; Van Wassenhove, 2006). For instance, Balcik et al (2010) elaborate building coordination mechanism to work under one umbrella organizations by implementing collaborative procurement system, third-party warehousing and etc. Stephenson Jr (2005) referred to humanitarian network as social network (Grandori & Soda, 1995), which is characterized by fewest formal coordination mechanism. Van der Laan et al.

(2009) emphasize the inter-organizational coordination between the relief actors, thereby suggest some activities which are completely discussed in the parts related to practices of humanitarian supply chain.

2.2.4. Supply Chain Performance Measurement

Supply chain performance measurement (SCPM) is defined as supportive actions to ensure execution of supply chain strategy and to ensure achievement of key supply chain management drivers (Maestrini 2017). According to Kusrini . (2014), good SCPM is specified considering the context, content and process. Maestrini (2017, p.301) defines SCPMS as “a set of metrics used to quantify the efficiency and effectiveness of supply chain processes and relationships, spanning multiple organizational functions and multiple firms and enabling SC orchestration”.

As the purpose for a commercial business is to make profit, Kaplan and Norton (1996) created one of the most cited frameworks for organizational performance measurement. Fundamentally it aims to balance the non-financial metrics of an organization with its financial metrics in order to prove how organizational performance measurement is linked to the competitive advantage of the firm (Balfaqiha, 2016). Then this balanced scorecard framework has been modified later to fit the supply chain throughout the supply chain performance measurement literature (Balfaqiha., 2016). Unfortunately, the balanced scorecard and key performance measurement are tools to measure organizational performance within only one organization (Cooper and Ezzamel, 2013). In fact, originally Kaplan and Norton (1996) created the balanced scorecard as a tool for managers for implementing the company’s strategy to operational level (Cooper and Ezzamel, 2013, citing Kaplan and Norton, 1996).

In the supply chain discipline, scholars are calling for frameworks to measure multiple organizations within the supply chain (Maestrini ., 2017). Several scholars support the view that performance measurement is important for the organization to improve itself (Cooper and Ezzamel, 2013; Maestrini et al., 2017; Beamon, 1999; Kusrini et al., 2014). Besides, measuring performance of the whole supply chain has become increasingly important for globally operating companies to succeed in a dynamically changing the business environment (Gunasekaran and Kobu, 2007). In fact, measuring performance of the supply chain is considered as part of a company’s competitive strategy (Gunasekaran et al., 2004). Kusrini (2014) propose that the aim in measuring performance of supply chains is to find improvements, to manage supply chains more efficiently and to find opportunities to succeed in

the future. Several scholars propose criteria for good SCPMS (Beamon, 1999; Kursini ., 2014), while others discuss the scope and methods of the SCPMS (Cuthbertson and Piotrowicz, 2008; Cuthbertson and Piotrowicz, 2011; Beamon, 1999; Gunasekaran ., 2004; Gunasekaran and Kobu, 2007).

Beamon (1999) proposes a framework to measure supply chain performance that involves three levels of metrics: output, resources and flexibility. According to Beamon (1999), output measures customer responsiveness, such as delivery time, quality of product/service and the quantity of products produced. The resources level measures resources to achieve high level of efficiency through measuring shared infrastructures and equipment utilization, inventory management levels, energy usage and total costs of operations such as costs for maintenance, personnel and manufacturing (Beamon 1999). According to Beamon (1999), flexibility measures through increased customer service, ability to adjust demand variations and as ability to adjust to poor supplier performance and poor delivery performance.

Gunasekaran et al (2004) propose that supply chain activities should be measured according to stages of the supply chain: planning, sourcing, make/assemble, deliver to customers. Furthermore, in each stage operational, tactical and strategic levels of metric should be applied. Strategic metrics refer to measurement metrics that help top level management in decision-making, such as measures of competitiveness, company's financial statements and measures to enhance organization's goals. While the tactical level metrics considers measuring performance according to targets in order to achieve results as set on the strategic level. Metrics in the tactical level take into account resource allocation and they help middle managers in their decision-making. Operational metrics target employees at the operational level with the objective that if they meet their targets, then the tactical level measurements can be achieved. In the operational level, the metrics are accurate and help the low-level managers in their decision making.

Moreover, Beamon (1999) proposes that effective Supply Chain Performance Measurement includes characteristics such as measurement of all relevant aspects, generalizability to compare the measurement to data that is different, measurable data, alignment with organizational strategy. Effective performance measurement systems capture also organizational performance both in financial and non-financial metrics, which can be translated to strategic, tactical and operational levels for decision making and monitoring purposes.

Similarly, Kursini(2014) propose that good criteria for SCPMS are drawn from strategy, measures are understandable, needs of the stakeholders are included, measures focus on value-adding business processes and measures involve stakeholders to promote the success of the company.

2.2.5. Performance Measurement of Humanitarian Organizations

Global disasters have been increasing in diversity, occurrence and brutality for the past decades (IFRC, "World Disasters Report 2011). To mitigate the effect of such disasters, humanitarian organizations (HOs) are busy saving lives and helping surviving victims in disaster-prone areas. To improve humanitarian operations, performance measurement is the first step (Qing Lu Mark Goh Robert de Souza, 2013). Despite significance of performance measurement systems supporting for respective measuring performance have been less developed and implemented in the relief chain (B. M. Beamon and B. Balcik,). In addition to the common problems in the non-profit sector such as performance measuring criteria ambiguity [M. O'Neill and D. R. Young, 1988], the fundamentally unique characteristics of the humanitarian operational environment made their respective performance measurement as one of the challenges of the discipline of humanitarian organizations.

Measuring performances of humanitarian organization fundamentality has no questions as the humanitarian sector has numerous projects operating through agencies of various interest, natures, sizes, etc... Diversity of the organizations made access for resources based only for competing for donor funding and higher demands for accountability of donors, media and the public. According to (B. M. Beamon and B. Balcik,) designing and employing relevant performance measurements could only assist humanitarian organizations measure their respective performances on the basis of realized impacts of disasters, augment preparedness and as a result alleviate the effect of such disasters, and ultimately efficiently manage donor funds to maximize assistance to the beneficiaries. There is a revealing evidence supporting most of the early works of humanitarian organizations performance measurement mainly focused on measuring outcome attributes (R. S. Kaplan 2001). For example, the balanced scorecard approach, originally developed by Kaplan and Norton, this model has been expanded into the humanitarian disciplines and organizations to measure their performances using the model borrowed from industries.

While most performance measurement frameworks in humanitarian organization are borrowed from commercial world, Henderson et al., argued that many commercial measurement performance indicators do not apply for humanitarian organizations. In support of this argument they submit evidences such as a “bottom line” measurement of profit or loss are not applicable to the humanitarian organizations. Rather step by step guides were suggested to measure output and outcome attributes, identifying the organization’s mission, developing qualitative requirement to measure and indicate performances, developing primary indicators and measurements, and implementing the new performance measurement system (N. Buckmaster 1999). Davidson (D. A. Henderson, B. W. Chase, and B. M. Woodson 2002) proposed a framework of four performance indicators, namely, appeal coverage, donation to delivery time, financial efficiency, and assessment accuracy.

Some studies conducted to understand performance indicators of humanitarian organization also remarked that performance measurement in HOs is challenging because they are not adapted to such practices. Beamon and Balcik proposed a performance measurement framework for humanitarian organizations after comparing the differences between commercial and humanitarian organizations in areas such as revenues, goals, stakeholders and performance measurement. They proposed a three-part framework performance measurement system focusing on resource performance metrics, output performance metrics, and flexibility metrics.

In summary, performance measurement in humanitarian organizations is less established in comparison to the commercial world. While there are some well-known generic frameworks for commercial firms such as the SCOR model and the Balanced Scorecard, there is no any universally accepted performance measurement framework in humanitarian organizations and it is difficult to develop appropriate metrics (A. L. Davidson 2006). Moreover, many humanitarian organizations do not have appropriate performance measurement metrics, and those that do tend to make the mistake of employing too many metrics (P. Tatham and K. Hughes, 2011) which stretches their resources in data tracking and maintenance. Another challenge often faced by humanitarian organizations is the lack of data and system to capture information. Additionally, data gathering varies from country to country and there is no consistency in data definition, which creates difficulty in the development of a standard performance measurement management framework.

2.3. Research Gaps

From the above literature review, it is evident that the focus has so far been on SCM integration within the private and public-sector companies and not within the humanitarian aid sector. Businesses that aim at profit maximization integrate their functions in order to achieve real time and efficient processes for the maximization of shareholders' wealth. Humanitarian organizations also need to integrate their SCM activities in order to deliver to the beneficiary within the required time and at the least possible cost in order to save more lives.

2.4. Conceptual Framework

Supply chain management can be classified into three macro processes (stages) to better understanding of supply chain integration Chopra and Meindl (2007):

- i. Customer relationship management: all processes and activities those focus on downstream interaction between the organization and customer.
- ii. Internal supply chain management: all processes and activities that focus on internal operations within organization.
- iii. Supplier relationship management: processes that focus on upstream interaction between organization and supplier.

Supply chain management couldn't be able to achieve its objectives and be effective unless it maintained internal (inter departmental) and external coordination and collaboration, thereby the importance of supply chain integration has emerged between and among these processes and activities. In addition, supply chain must be designed in a way that ensure all processes, activities, roles, and stages are aligned to support the supply chain strategy.

Many researches and academic papers have been written about supply chain management and its elements. Few studies have addressed both SCM elements, supply chain integration and performance together.

Zhang et.al. (2012) focused on dependence and trust and its impact on external integration (supplier and customer). Frohlich and Westbrook, (2001) studied the arcs of integration (supplier and customer). Zhao, et. al. (2011) emphasized on internal integration and concluded that internal integration is the source of both customer and supplier integration through relationship commitment to customer and relationship commitment to supplier.

Huo (2012) concluded that internal integration improves external integration, and both integration directly and indirectly enhance company performance.

Xu, et. al. (2014) explored intra-organizational resources (Top management support and Information technology) and inter-organizational capabilities (Supplier and Customer integration) and its effect on competitive advantage (Performance). Thus, we can see that the relationships between and among supply chain activities, processes, and personnel who perform specific tasks is very important to add value for overall supply chain partners.

Accordingly, regarding to the importance of all supply chain elements, this study will intend to investigate the supply chain integration into two broad categories: Inter-organizational, and Intra-organizational integration variables. Thus, this study considers the three independent variables as measure of supply chain integration. These are *information integration*, *resource sharing & coordination* and *internal processes integration*.

Different researches have been conducted on performance measurement of humanitarian sector. Beamon et al. (2008) suggested that performance in humanitarian settings be measured as output, resources, and flexibility. Schulz et. al. (2009) proposed that they be measured as customer service, financial control and process adherence.

This study considered to see organizational performance with indicators such *effectiveness*, *efficiency*, *quality*, *accountability*, *responsiveness* and *sustainability*.

Conceptual Frameworks

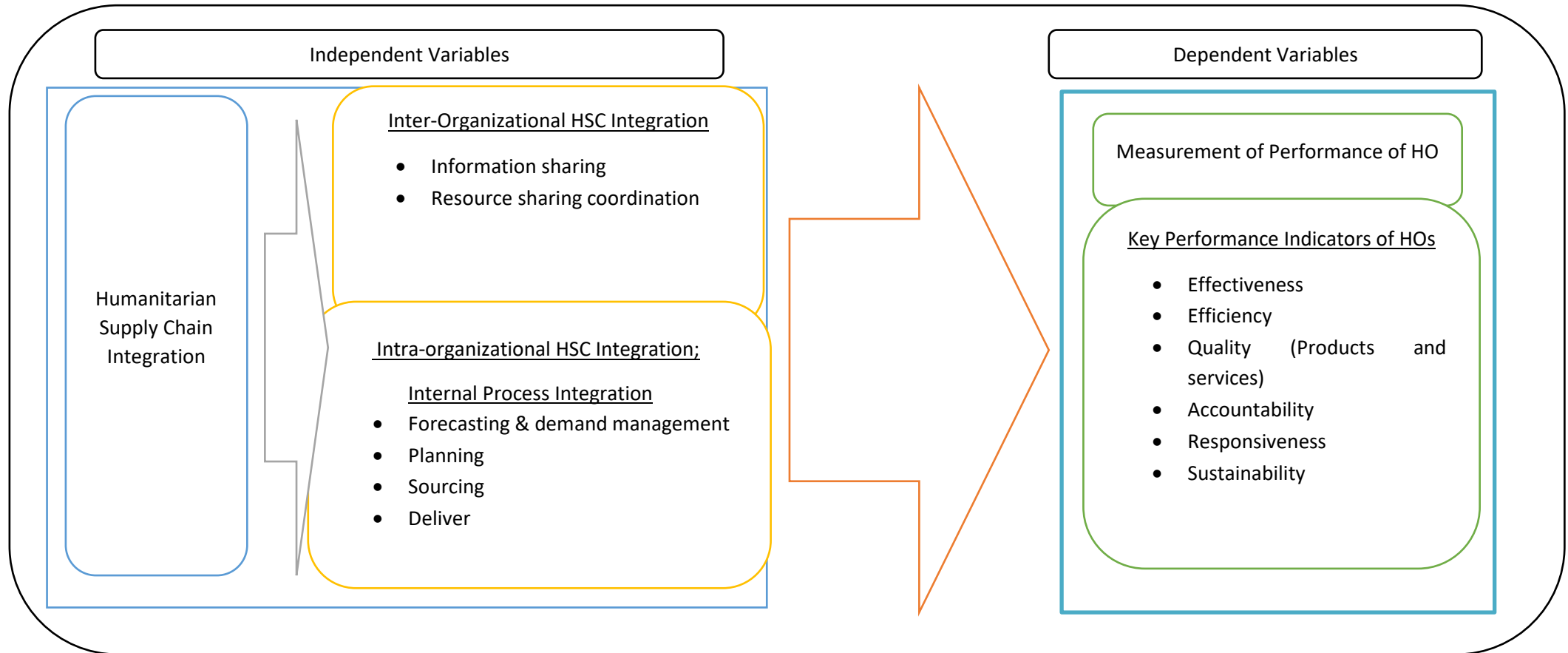


Figure 1 Conceptual Frameworks

(Source: Adapted from: Alfalla-Luque *et al.*, 2012; pp. 9 , Ira Havisto , Helsinki 2014 ; pps 41 , 54 , 102., and Fritz Institute Humanitarian

Supply Chain, Thomas, 2004, Keller, 2011; Abdifatah, 2010; Abdulhakim,2018; Ushus, 2014;

3. CHAPTER THREE: RESEARCH DESIGN AND METHODOLOGY

This chapter deals with description of the study area research design, target population, source and types of data, sample size and sampling techniques, method of data collection and method of data analysis.

3.1. Description of the study area

The purpose of the study is to measure the roles of Supply Chain Integration on Performances of Humanitarian Organizations operating in Ethiopia in selected international humanitarian non-governmental organizations. The study considered six major humanitarian organization operators which stationed in Addis Ababa and their respective field offices across all regional states in Ethiopia. The total number of Humanitarian organizations in the country counted 52. However, the study used purposive sampling technique to select to unit of analysis these are World Food program, Concern World Wide, Goal Ethiopia, Catholic Relief Services, Care Ethiopia and UNHCR. Six respondents from each of these six humanitarian organizations have been selected to participate on the quantitative survey using questionnaire through electronic self-administered methods of data collections.

3.2. Research Approach

There are three research methods that are common in a research these are quantitative, qualitative and mixed, as methods any one of them is more or less better over the others, rather each method depends on how any researcher might wanted to conduct a research of study (Creswell, 2005).

Quantitative research is a type of research involving the use of organized questionnaires where the response options are predictable, and a large number of respondents are involved. According to Creswell (2005), quantitative research is a type of educational research in which the researcher decides what to study, asks specific, narrow questions, collects numeric (numbered) data from participants, analyses these numbers using statistics, and conducts the inquiry in an unbiased, objective manner. According to (Sekaran, 2003) a quantitative method of research is any study comprising analysis of data and information that are descriptive and quantifiable.

Therefore, in order to address the research objectives, a quantitative survey approach is employed. The target population of this study was selected international humanitarian organizations currently working on food aid provision in Ethiopia. After selecting six target organizations a questionnaire was distributed to the respondents, who are considered as key informants with respect to this research objectives, such as logistics officers, procurement officers, and supply chain professionals.

3.3. Research Design

The research adopted a both descriptive survey research and explanatory research designs in conducting this study. According to Kothari (2003) a descriptive survey method is used when a researcher intends to describe a situation or a condition as it is. It also offers the opportunity for a logical structure of the inquiry into the problem of study. Descriptive design was thus used to interpret data and understand situations. Explanatory design was also used to analyse and demonstrate the relationship and associations between the independent and the dependent variables.

3.4. Target Populations and Sampling Techniques

3.4.1. Target Population

As per the information obtained from official sources, currently there are 52 humanitarian organizations registered in Ethiopia to implement humanitarian relief assistance programs in various areas of the country. Hence, among the list of Humanitarian organizations operating in Ethiopia, International Non-Governmental organizations (INGOs) which are engaged in the provision of humanitarian aid assistances in the country are considered as the target population of the present study.

3.4.2. Sampling Techniques

There are two types of sampling techniques probability and non-probability sampling techniques. Non-probability sampling is that sampling procedure which does not consider any basis for approximating the probability of each item in the population has been included in the study. The non-probability sampling is also recognised by different terms including deliberate sampling, purposive sampling and judgement sampling. In non-probability sampling technique,

items for the sample are selected intentionally by the researcher; the choice of the researcher regarding the items remains supreme. Thus, under this sampling techniques the organizers of the inquiry purposively choose the certain units of the universe for constituting a sample on the basis that the small mass that they so select out of a huge one will be typical or representative of the whole (Creswell, 2009).

Therefore, the sample units of the research were chosen based on the non-probability sampling method or judgmental sampling. The major reason for researcher prefers to employ purposive sampling method is aiming to collect comprehensive and reliable information from the sources having relevant knowledge and/or experience directly related to the unit of the study. Accordingly, HSC professionals and other key staff members responsible for planning, implementing, and managing and controlling emergency relief food assistance programs in humanitarian organizations were selected as a sample unit of the present study.

3.4.3. Sample Size

During early stages of the thesis project , researcher proposed to undertake the assessment across all 52 humanitarian organizations operating in Ethiopia , however , due to the uncertainty posed by the COVID_19 after defending the thesis proposal the researcher came to realize with such conditions limiting mobility , movements , personal visit to respondents' office and even difficulties to access respondents remotely as the study target respondents are assumed to be a frontline staffs on such pandemic circumstances as well as any other inherently created situations redesigned the study's target population, sample size and sampling techniques to respond for these realities.

The population of the study therefore, involved out of 52 total humanitarian organizations operating in Ethiopia only six humanitarian organizations. The researcher conducted a raid assessment to explore relevant target populations through review of secondary data. Thus, according to Humanitarian Response plan for the fiscal year of 2020 jointly developed with major humanitarian players in the aid sector there are six humanitarian organizations operating in the food aid cluster. This plan also revealed among food aid cluster project implementing partners there are six international non-governmental organizations with a project focusing on logistics and supply chain management services. The plan further revealed these humanitarian organizations have been actively engaged in providing logistics, financial and technical assistances clustered under supply chain management thematic areas. According to the humanitarian response plan it was realized that these organizations are *World Food program*,

Concern World Wide, Goal Ethiopia, Catholic Relief Services Care Ethiopia and UNHCR. Based on the screening criteria these organizations have on-going food aid supply chain interventions across all regional states of the nation.

Therefore, these six major operators were considered as a target population for the study. Six respondents were involved from each of the organizations. Therefore, the total sample size for the study was redefined to 36 respondents. Each respondent has been selected on the basis of seniority and relevance of positions held in his/her respective organizations.

3.5. Data Collection Technique

Primary data collected from supply chain professionals of all organizations through questionnaire. The data was collected by use of a structured questionnaire that is in the form of a Likert scale where respondents were required to indicate their views on a scale of 1 to 5.

Primary data were gathered using self-administered questionnaires through electronic communication methods. The research considered these methods of communications suitable to address challenges pertaining to movements and reducing personal contacts with respondents as a result of problems posed by COVID-19. In addition, respondents of the research assumed to operate from home and/or on field mission fighting the pandemics which made them less accessible in their duty stations or offices in Addis Ababa. This method of data collection has its own advantage because of it is low cost, it is also verified to be free from bias of respondents, it also gives respondents an adequate time to respond and since the results are also more dependable and reliable.

To improve the response rate, a cover letter was enclosed to explain the reasons for the research, why the research is important, why the subject is selected and a guarantee for the respondent about the confidentiality of the information and using the result for intended purpose only.

3.6. Source and Types of Data

Primary data were gathered using self-administered questionnaires through electronic communication methods.

In addition, the secondary sources of information used in the study include different publications by researchers, internet search, articles, journals, and others material.

3.7. Method of Data Analysis

The collected data coded and entered into the Statistical Package for Social Sciences (SPSS) program according to each variable of the study for analysis. According to Mugenda (2009), descriptive analysis involves a process of transforming a mass of raw data into tables, charts, with frequency distribution and percentages, which are a vital part of making sense of the data.

In this study descriptive analysis was employed to summarize the demographic characteristics of the respondents and to understand events based on the response for each item and analysed by comparing the mean and standard deviation score of each variable. The mean used to describe and compare each variable. Pearson Correlation used to identify the degree and direction of the relationship between independent and dependent variables. The data was presented using tables and figures to give a clear picture of the research findings at a glance.

Regression coefficients are also obtained from the SPSS data analysis, for the variables in the regression that are standardized, including the dependent and all of the independent variables, and the magnitude of the coefficients can be compared to see which variable has more of an effect on the outcome. The Beta (β) coefficients are the standardized regression coefficients. Their relative absolute magnitudes for a given step reflect their relative importance in predicting perceived value.

The regression equation is therefore, $y = B + \beta_1x_1 + \beta_2x_2 + \beta_3x_3$

Where: y = Organizational performance

β_i ($i = 0 - 3$) are the regression coefficients

X_1 = Information sharing

X_2 = Resource sharing and coordination

X_3 = Internal process integrations

The significance level of the regression was examined by conducting the F- test while the multiple regression coefficient, R^2 , used to determine how much of the variation in Y is due to changes in the dependent variable X_i .

3.8. Ethical Considerations

As a primary responsibility, the researcher has granted prior confirmation for the respondents for any information gathered for its confidentiality and guaranteed their privacy during treating

the information they gave. The purpose of the research was clearly explained for respondents before engaging them in the survey. It was clearly informed for the respondents that data and study results remain confidential, secured, not disclosed to any one; and solely used for academic purpose.

CHAPTER FOUR:

DATA ANALYSIS, RESULTS AND DISCUSSIONS

This chapter deals with Results of demographic characteristics, descriptive analysis and inferential statistical analysis.

4.1. Introduction

This section of the thesis aims to present analyzed data collected from selected sample respondents. The data presentation formats include tables, frequencies and percentages. The primary data gathered using a structured questionnaire. SPSS (Statistical Package for Social Sciences) software was used for analysis of the data gathered from 36 respondents. Out of a total of 36 respondents, 36 (100 %) of them filled and returned the questionnaires.

4.2. Demographic Characteristics

The study attempted to analyze the respondents' demographic characteristics with respect to their position and years of experience to determine whether they have the required supply chain management knowledge. This was to ensure that the survey results were valid and reliable.

Questions as to the position of the respondents and the number of years of work experience were fronted and the results were received and analyzed as follows;

4.2.1 Work Experience

Table 4.1: Years of Experiences

Years of Experience working in HOs					
Response Options		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1-10yrs	6	16.7%	16.7%	16.7%
	More than 10 Yrs.	30	83.3%	83.3%	100.0%
	Total	36	100.0%	100.0%	

Source: Field Survey April 2020

As illustrated on table 4.1 it is evident that 16.7% of respondents indicated they have less than 10 years of experience in humanitarian organizations while the remaining respondents (83.3%) claimed that they have more than 10 years of experience. It can be concluded that since most respondents have more than 10 years of experience, they have better know how regarding SCM and thus are in a good position to provide reliable information to measure the impact of SCM integration on performances of their organizations.

4.2.2. Job Positions

Table 4.2 presents respondents' job positions in their respective organizations: as Supply Chain Manager (8.3%), Logistics Manager (11.1%), Supply Chain Officer (8.3%), Logistics officer (47.2%), procurement officer (8.3%) and program manager (16.7%).

It can be observed that the job positions related to supply chain management account for a total 83.3% of the respondents. This confirms that the respondents of this study were supply chain professionals, familiar with, and have knowledge and experience of the facts about SCM integration and organizational performance situations.

Table 4.2: Respondents' Job Position

Respondents' current job position in the HOs					
Response Options		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Supply Chain Manager	3	8.3%	8.3%	8.3%
	Logistics manager	4	11.1%	11.1%	19.4%
	Supply Chain Officer	3	8.3%	8.3%	27.8%
	Logistics Officer	17	47.2%	47.2%	75.0%
	Procurement Officer	3	8.3%	8.3%	83.3%
	Program Manager/Coordinator	6	16.7%	16.7%	100.0%
	Total	36	100.0%	100.0%	

Source: Field Survey April 2020

4.3. Level/Extent of SCM Integration: Results of Descriptive Analysis

The study sought to establish the extent to which the selected international humanitarian organizations in Ethiopia had integrated their SCM functions internally and their supply chains with upstream and downstream actors in the chain.

The extent of integration was measured in terms of the three integration dimensions (independent variables).

The participants were asked to respond on the extent of supply chain integration in their organizations, and rated their responses on a five-point Likert- type scale where:

5-to a very large extent, 4-to a large extent, 3-to a moderate extent, 2-to a small extent, and 1-to not occur.

The findings are presented in below table 4.3. In the process of examining of the data, standard deviation was used. Small standard deviations (relative to the value of the mean itself) indicate that data are close to the mean whereas a large standard deviation (relative to the mean) indicates that the data points are distant from the mean. Standard deviation is a measure of how well the mean represents the data.

Table 4.3 The level or extent of HSC Integrations

Descriptive Statistics – Summary of Mean and Standard Deviations			
Variables	N	Mean	Std. Deviation
Humanitarian Supply Chain Integrations – Information Integration	36	3.3889	0.76842
Humanitarian Supply Chain Integrations: Resource sharing and Operational coordination	36	3.3264	0.88402
Humanitarian Supply Chain Integrations: Internal process integrations	36	3.2037	1.00167
Valid N (listwise)	36		

Source: Field Survey 2020

The survey result showed that, the mean of all the independent variables (information Integration, resource sharing & coordination, internal processes integration) are in the high extent from 3.3889, 3.3264 and 3.2037 respectively.

The standard deviations of these variables vary from 0.76842 to 1.00167; information integration with the lowest deviation, internal processes integration is with the highest deviation occurred in this result of analysis.

Most respondents revealed the extent of integration in terms of Information sharing, resource sharing and internal process coordination and that there is strong association b/n the variables and supply chain integration.

The survey finding is in line with existing literatures. Trkman & Groznik (2006) stated that SCM integration enhances the process of information sharing within the organization and outside the organization (suppliers, channel partners, customers and other stakeholders).

According to Beamon and Balcik (2008) Coordination is vital for the success of HSCs as all share common characteristics such as operating in uncertain environment, sudden massive demand and lack of resources. Likewise, Xu, et. al. (2014) revealed both intra-organizational resources and inter-organizational capabilities have linear effects on performance of organizations.

4.4 Relationship between Supply Chain Integration and Organizational Performance: Inferential Analysis Results

This section exhibits data analysis and the results of the statistical test. Inferential Data Analysis is conducted by correlation and regression analysis, by using statistical software SPSS. Based on this, the outputs of the measurement assessment of correlation and regression are discussed.

4.4.1 Correlations

Correlation measures the degree to which the change in one variable follows the pattern of change in the other variable. Field (2010). Pearson product-moment correlation coefficients were computed to assess the relationship between the independent and dependent variables that are measured quantitatively.

The findings of the correlation matrix analysis between each variables/dimensions of supply chain integration (i.e., information Integration, Resource sharing & coordination and Internal processes integration) and organizational performance are shown in table 4.4 below.

Table 4.4: Summary of correlation test (Correlation Matrix)

		Performances of Humanitarian Organizations	Information Integration	Resource sharing and coordination	Internal process integrations
Performances of Humanitarian Organizations	Pearson Correlation	1	.627**	.822**	.704**
	Sig. (1-tailed)		.000	.000	.000
	N	36	36	36	36
Information Integration	Pearson Correlation	.627**	1	.518**	.377*
	Sig. (1-tailed)	.000		.001	.012
	N	36	36	36	36
Resource sharing and coordination	Pearson Correlation	.822**	.518**	1	.612**
	Sig. (1-tailed)	.000	.001		.000
	N	36	36	36	36
Internal process integrations	Pearson Correlation	.704**	.377*	.612**	1
	Sig. (1-tailed)	.000	.012	.000	
	N	36	36	36	36

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

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

Source: Analysis of survey data, April.2020

Table 4.4. depicts the values of Pearson's correlation along with the associated significance value between the independent and dependent variables.

It shows the Pearson an r's, the significance of each r, and the sample size (N) for each r. It can be assumed that the value of the one variable is a linear function of the value of the other variable. Correlation coefficients describe how well a straight line fits the data. The correlation coefficient or "r" provides a numerical measure of the strength of the relationship between two numeric variables. The rule of thumb for interpreting correlation coefficient is to divide the range of possible scores in five intervals:

If r value is 0 to 0.20 corresponds to a very weak relationship;

If r value is 0.21 to 0.40 corresponds to a weak relationship,

If r value is 0.41 to 0.60 corresponds to a moderate relationship,

If r value is 0.61 to 0.80 corresponds to a strong relationship, and

If r value is 0.81 to 1.00 corresponds to a very strong relationship (Cohen -2003). These rules apply whether the sign of the correlation coefficient is positive or negative.

Therefore, from the above table the r value of Information Integration is 0.627 with p-value<0.05(0.001). So as a factor it is positively and strongly correlated (since it lies between 0.61 to 0.80 corresponds to a strong and positive relationship).

Resource sharing and coordination factor has r-value 0.822 with p-value<0.05(0.000), as factor is positively and very strongly correlated (since it lies between 0.81 to 1.00 corresponds to a very strong and positive relationship).

Internal process integration has r-value 0.704 with p-value<0.05(0.000) as factor it is positively, and strongly correlated (since it lies between 0.61 to 0.80 corresponds to a strong and positive relationship).

Thus, the data supported that SCI constructs are positively linked to supply chain performance. It can be concluded that the Supply chain integration and organizational performance have positive and strong relation based on Pearson correlation coefficients of the variables.

4.5 Role of Supply Chain Integration on Organizational Performance:

Multiple Regression Analysis

In this study multiple regressions were conducted in order to examine and measure how much of the variability in the outcome (performances of humanitarian organizations) is accounted by the mentioned predictors.

4.5.1 Model summary

Table 4.5 below shows the model summary. R is the population correlation coefficient, and it takes on values between -1 and +1; 0 indicates no linear association; 1 indicates a perfect positive linear relationship; -1 indicates a perfect negative linear relationship. The analysis

results showed that $R=.886$ implying that there is an association of 88.6% between observed and predicted organizational performance. Thus, it can be interpreted as that observed organizational performance and predicted organizational performance have a strong correlation.

The value of R^2 also called coefficient of determination is a measure of how much of the variability in the outcome (organizational performance) is accounted for by the mentioned predictors. It indicates how the organizational performance varies with variation in supply chain integration practices. As shown in table 4.5, R^2 value is 0.786, which means that all the three independent variables considered in this study (Information integration, Resource sharing & coordination and Internal processes integration), explain 78.6% of the performances of the organizations. Therefore, the independent variables are critical factors that account for bigger proportion of the variance in organizational performances and hence significantly contribute to the level of performance that is achieved among the international humanitarian organizations. The remaining 21.4 % of the variance is explained by other variables not included in this study.

Table 4.5 Model summary

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.886 ^a	.786	.766	.42675

- a. Predictors: (Constant), , Information Integration , Resource sharing and coordination , Internal process integrations
- b. Dependent Variable: Performances of humanitarian organization

4.5.2 Regression Coefficients

The regression coefficient is the independent variable associated with it contributing significance to the variance accounted for in the dependent variable.

Table 4.6: Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.416	.347		-1.199	.239
	Information Integration	.221	.085	.251	2.611	.014
	Resource sharing and coordination	.585	.129	.510	4.531	.000
	Internal process integrations	.297	.104	.297	2.863	.007

a. Dependent Variable: Performance of humanitarian Organizations

Source: Field Survey 2020

The above table 4.6. depicts the coefficients of multiple regressions showing in detail the beta (standardized and unstandardized) value of various independent variables and its associated significance value.

The following points discuss the interpretation of the table,

B column shows the constant values for the regression for predicting the dependent variable from the independent variable. Beta is measured in units of standard deviation. The table displays the estimates of the multiple regression of performance of humanitarian organization in Ethiopia against its independent variables.

The Un-Standardized Coefficients of determination under the B column in, table 4.6, were used to substitute the unknown beta values of the regression model. The beta values indicated the direction of the relationship. A positive or negative sign indicates the nature of the relationship.

The significant values (p-value) under sig. column indicate the statistical significance of the relationship or the probability of the model giving a wrong prediction. A p-value of less than 0.05 is recommended as it signifies a high degree of confidence. In this case, the predictor variables produced statistically significant results $p < 0.05$. Information Integration ($p = 0.014$), Resource sharing and coordination ($p = 0.000$), Internal process integrations ($p = 0.007$).

From the results, it can be seen that a p-value of the above-mentioned factors scores are less than 0.05. These variables have direct and significant relationship with performance of supply chain integrations and can be inferred that the mentioned variables are critical predictors that have major contribution for the performance of supply chain integrations.

Thus, $B4 = -0.416 + 0.221*B1 + 0.585*B2 + 0.297*B3$

Where:

B4 = Performance of humanitarian organization

B1= Information Integration

B2 = Resource sharing and coordination

B3= Internal process integrations

According to the finding, the multiple linear regression equation established that every unit measure of increase in information integration, would lead to an increase in organizational performance by a factor of 0.221 units while every unit measure of increase in resource sharing & coordination would lead to an increase in performance by a factor of 0.585. The study also found that a unit increase in internal processes integration would lead to an increase in organizational performance by a factor of 0.297.

The summary of the regression table findings showed that significance value of the three independent variables are less than 0.05 which show that the model is statistically significant to predict the analysis of supply chain integration role on organizational performances. Implying that the variables are statistically significant factors which are suitable predictors of performance.

The findings are consistent with previous studies conducted on the role of supply chain management integration on organizational performance. Internal process integration results are significant for organizational performance is consistent with the finding of EVANS M. MOSE, 2013. Inter organizational integration results are significant for performance is also consistent with previous findings of Kapucu, Arslan et al. 2010; Kovács and Spens 2011).

5. CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the conclusions according to the findings on each of the objectives and gives recommendations as per the research objective.

5.1. Summary of findings

The findings of the analysis on the extent of supply chain integration practices revealed that the result mean values of information integration (3.3889), resource sharing and coordination (3.3264) and internal processes integration (3.2037) ranked from one to three respectively. The result of the analysis implies the high extent of supply chain integration practices by the humanitarian organizations since all of the dimensions have fallen in the higher rate as per the survey scale instrument.

The study also sought to examine the relationship between supply chain integration and organizational performance which is the second objective of the study. The result of the correlation between the dependent and independent variables was that *information integration* ($r=.627$) is positively and strongly correlated, *resource sharing and coordination* ($r=.822$) is positively and very strongly correlated and *internal process integrations* ($r=0.704$) is positively and strongly correlated. The findings indicated that HSC integration has significantly contributed to the level of performances that is achieved among the international humanitarian organizations.

According to the findings the coefficient of determination R^2 value is 0.786, which means that all the mentioned critical factors account for 78.6 % of the variation in the performance of supply chain integrations, indicating that 21.4% of the organizational performance could be explained by other factors which are not considered by the study.

From the results, it can be seen that a p-value of the independent variables scores are less than 0.05. Which means that these variables have direct and significant relationship with performance of supply chain integrations and can be inferred that the mentioned variables are critical factors that have major contribution or effects on performance of humanitarian organization operating in Ethiopia

5.2. Conclusions

The study revealed existence of high extent of supply chain integration practices. There is a strong culture and practices for sharing information, resource sharing and operational coordination across the Humanitarian Supply Chain Organizations. There is also high level of internal integration of functions within each organization.

The inferential statistical analysis result findings have shown that there are strong positive relationships with the dependent and independent variables: The independent variable, ***Humanitarian Organization Performance***, (explained in terms of efficiency, effectiveness, quality of services, accountability, responsiveness and sustainability dimensions) has showed statistically significant, strong and positive relationships with the independent variable ***supply chain integrations*** (explained in terms of ***information integration, resource sharing & coordination*** and ***internal process integrations***). The mentioned factors vary together with organizational performance with a degree that has significant impact.

The supply chain integration explained 78.6% of the variance of organizational performance; 21.4% of the organizational performance could be explained by other factors which are not considered by the study.

5.3. Recommendations

The study has confirmed that SCM integration is very significant in enhancing the performance of international humanitarian organizations thus

- ✚ the Humanitarian organizations are advised to improve better integration practices in all the dimensions of integration so as to reap the benefits from it.
- ✚ other organizations should also be encouraged to incorporate supply chain management integration practices in their strategies in order to better serve the beneficiaries and to stay in business.
- ✚ there may be other factors which are not considered in this study but could have explained organizational performance. Thus, organizations should also consider and adopt these factors of integration to maximize performance.

5.4. Recommendations for future research

The research would have been better should it considered every supply chain operators which have not been included in this scope of study. Several scholars propose that humanitarian supply chains consist of a wide range of actors such as governments, non-governmental international organization, donors, suppliers, end beneficiaries, local non-profit organizations, military and private actors (Kovacs, et al, 2007). Thus, the researcher recommends to further analysis through broadening focuses:

- Supply Chain Integration and Humanitarian Supply Chain Integration in Ethiopia is one of the less focused and under researched sectors among practitioners and academicians. Therefore, similar cross sectional and longitudinal researches to contribute towards improvement performances of humanitarian organizations.
- The researcher recommends additional researches which recognize the role of government institutions, private service providers, and donor agencies as enabling actors of the humanitarian supply chains.

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Appendix 2 : Research Questionnaire

Introduction

I am a graduate student at Addis Ababa University School of Commerce. I am conducting a research on **Effects of Supply Chain Integration on performance of Humanitarian Organizations in Ethiopia**. This study is being carried out in partial fulfilment of the Award of a Master of Arts Degree.

You have been identified as one of the respondents for this study and you are kindly requested to fill the questionnaire. Information given will be held with confidentiality and will be used purely for research purposes. Your response is highly appreciated.

Instruction: Please Mark X where necessary.

Section A: General Information

1. Name of the organization

2. What is the position you hold in this organization?

I. Supply chain Manager / Logistics Manager /Procurement Manager

II. Supply Chain officer/ Logistics Officer /Procurement Officer

III. Others (please specify) _____

3. How long has your organization been in operation in Ethiopia?

Less than 10 years

10 years or more

Section B : Research Questions

Please indicate the extent to which the following statements concerning the level of SCM integration within your organization occur.

Use the scale of: 1= does not occur 2= small extent 3= medium extent 4= large extent 5= very large extent.

B1	Extent of Supply Chain Integration –					
	Information Integration					
		1	2	3	4	5
1	The organization share information with implementing partners on supply chain strategy and operational processes preparedness	☐	☐	☐	☐	☐
2	The organization share information with implementing partners on disaster preparedness stages	☐	☐	☐	☐	☐
3	My organization share information with implementing partners in undertaking assessment,	☐	☐	☐	☐	☐
4	My organization share information with implementing partners in terms of forecasting and demand planning	☐	☐	☐	☐	☐
5	My organization maintains open and transparent information flow organization and the implementing partners on inventory tracking and tracing of humanitarian aids shipment	☐	☐	☐	☐	☐
6	My organization maintains open and transparent information flow between other humanitarian organizations and the implementing partners on monitoring and evaluation of humanitarian projects	☐	☐	☐	☐	☐
B2	Resource sharing and coordination					
		1	2	3	4	5
7	As humanitarian organization engaged in Supply Chain Integration with other operators in the sector to enhance our capacity in terms of resource mobilizations	☐	☐	☐	☐	☐
8	As humanitarian organization engaged in Supply Chain Integration with other operators in the sector to enhance our capacity in terms of undertaking consolidated procurement	☐	☐	☐	☐	☐
9	As humanitarian organization engaged in Supply Chain Integration with other operators in the sector to enhance our capacity in terms of undertaking transportation executions	☐	☐	☐	☐	☐
10	As humanitarian organization engaged in Supply Chain Integration	☐	☐	☐	☐	☐

	with other operators in the sector to enhance our capacity in terms of undertaking stock asset management					
11	As humanitarian organization engaged in Supply Chain Integration with other operators in the sector to enhance our capacity in terms of undertaking extended point of delivery	☐	☐	☐	☐	☐
12	As humanitarian organization engaged in Supply Chain Integration with other operators in the sector to enhance our capacity in terms of undertaking facility sharing	☐	☐	☐	☐	☐
B3	Internal process integrations					
		1	2	3	4	5
13	In my organization every supply chain joint undertakes activities among others functions of the organization in terms of developing periodical forecasting and demand management process.	☐	☐	☐	☐	☐
14	In my organization every supply chain functions jointly undertakes activities among others functions of the organization in terms of developing short , medium and long term plans	☐	☐	☐	☐	☐
15	In my organization every supply chain functions participate in joint activities among others functions of the organization in terms of undertaking sourcing of humanitarian aids including goods and services	☐	☐	☐	☐	☐
16	In my organization every supply chain functions participate in joint activities among others functions of the organization in terms of undertaking delivery of humanitarian aids including goods and services for the recipient or beneficiaries	☐	☐	☐	☐	☐
B4	Relationship between SCM integration and organizational performance					
		1	2	3	4	5
17	Effectiveness (Cost) : There is better decision-making ability due to SCM integration and real-time visibility and improved information flow: better sourcing, tendering, stock monitoring and transportation management decisions.	☐	☐	☐	☐	☐
18	Efficiency (Lead times) : With an integrated SCM function, there is reduced lead time in the organization as information moves faster	☐	☐	☐	☐	☐
19	Quality of services : SCM integration has assisted in delivering emergency food supplies to beneficiaries with consistence quality, improved services offered to the beneficiary	☐	☐	☐	☐	☐
20	Accountability : Due to SCM integration there is improved transparency of supply chain processes: the way activities are conducted is visible for others	☐	☐	☐	☐	☐

	enabling better accountability to towards beneficiaries and donors					
21	Responsiveness : Increased delivery performance and response rate to disaster has been achieved due to integration: Enabled the organization achieve timeliness in humanitarian aid	☐	☐	☐	☐	☐
22	Sustainability: With an integrated SCM functions sustainability of projects enhanced through enhanced creating systems which otherwise not possible.	☐	☐	☐	☐	☐