ADDIS ABABA UNIVERSITY

COLLEGE OF BUSINESS AND ECONOMICS

Assessment of Humanitarian Supply Chain Management Challenges on Performance: The case of World Food Programme- Ethiopia

A Thesis Submitted to Graduate Stduies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Business Administration

By: Dessalegn Amenu Ejeta

Advisor: Dr. Mohammed Seid

May 2018

Addis Ababa

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Declaration

I, Dessalegn Amenu, hereby declare that the thesis entitled "**Assessment of Humanitarian Supply Chain Management Challenges on Performance: The case of World Food Programme- Ethiopia"** is my own original work and has not been submitted for any degree in any other university. It is offered for the award of the degree of Master of Business Administration from Addis Ababa University.

Name: **Dessalegn Amenu** *Advisor Name:* **Dr. Mohammed Seid**

Signature: _____ *Signature:* _____

Statement of Certification

This is to certify that the thesis prepared by Dessalegn Amenu entitled: **Assessment of Humanitarian Supply Chain Management Challenges on Performance: The case of World Food Programme- Ethiopia** and submitted in partial fulfillment of the requirements for the degree of Master of Business Administration compiles with the regulations of the university and meets the accepted standards with respect to originality and quality.

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Acknowledgments

I thank you Dr. Mohammed Seid, my advisor, for his intellectual support and advice during preparation of this thesis. Staff members of WFP Ethiopia and .National Disaster and Risk Management Commission of the Government of Ethiopia are acknowledged for their time and commitment in filling the questionnaire used in the present study.

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Abstract

In today's world, many people are being exposed to a number of natural and man-made disasters which claimed lives of several of them. Under such situations, the presence and relevance of humanitarian organizations is very crucial to allow the victims have access to basic supplies. In this process, the role of supply chain is paramount despite humanitarian organizations face many challenges with regards to supply chain management. Many research works were carried out in the field of humanitarian supply chain management. However, much focus has not been given to address the challenges of humanitarian supply chain management in emergency or relief operations and their impacts on operations of humanitarian organizations particularly in Ethiopia. Ethiopia is a landlocked country often affected by drought with food insecurity crisis. In this respect, the country is facing unique challenges in its humanitarian supply chain management which in turn influence the operations of humanitarian organizations. Therefore, the aim of the present study was to assess the challenges of humanitarian supply chain management in WFP Ethiopia. The study adopted descriptive research type and involved collection of primary data through questionnaire survey and the contents of the questionnaire had two parts: (1) the profile of the respondents and (2) humanitarian supply chain management challenges in the form of Likert scales. The focus of the questionnaire in terms of humanitarian supply chain challenges were related to lack of coordination, information and communications integration, inadequate transport capacity, port congestions and custom clearance and inadequate warehousing. In addition to the questionnaire survey, key-informant interviews were made with senior management personnel of WFP Ethiopia and NDRMC. Secondary data on relevant items were also collected. The survey results showed that an inadequate warehouse in terms of capacity and number was the most supply chain challenges that WFP Ethiopia was facing. The rating of the challenge of warehouse was followed by lack of transportation facilities and coordination related challenges. The result of the key-informant interviews also showed similar result in which most of the informants agreed that various inter-related challenges are existing in WFP Ethiopia supply chain management. Based on the present study, it is recommended that emphasis should be given to warehouse, transportation and coordination management in order to improve supply chain management of the organization.

Key Words: Supply chain management challenges, humanitarian organizations

CHAPTER ONE

1 Introduction

1.1 Background of the study

Every year, many people are being exposed to both natural and man-made disasters resulting in displacement and death of thousands across the world (International Federation of Red Cross 2010). According to a report by Development Initiatives (2017), worldwide over 377 million people were affected by disasters associated with natural hazards in the year 2016. The report shows that compared to the year 2015 estimate, the number of people exposed to natural disasters in 2016 has increased by more than 267 million people demanding about $27 billion for humanitarian assistance. Noteworthy to mention some of the recent highly catastrophic crises the world is witnessing include those occurred in South Sudan, Somali, Yemen, Syria, Iraq, India, Rohingya Muslims in Myanmar and many others which have claimed the lives of millions of people and left others homeless (UNOCHA 2017).

Under such situations, the presence and relevance of humanitarian organizations is very crucial to allow the victims have access to basic humanitarian supplies.

Humanitarian organizations are institutions established and dedicated to providing aid or humanitarian assistances to the vulnerable people in emergency areas and where people are afflicted by conflict, disease and poverty (Beamon and Balcik 2008). The funding sources to cover the entire expenditures of humanitarian assistance are fully contribution and donations from development partners or donors, government and volunteers (Wassenhove 2006).

The United Nations World Food Programme (WFP) is one of humanitarian organizations with worldwide presence with main goal to fight hunger and provide food assistance to millions of vulnerable and food insecure people. The organizational profile of WFP shows that it reaches more than 80 million people with food assistance in 80 countries every year (http://www1.wfp.org). WFP Ethiopia is one of the many United Nations (UN) organizations operating in the country with main focus to provide food assistance. According to the WFP Ethiopia 2018 interim country strategic plan (ICSP), the activities of WFP is in agreement with UN sustainable development goals and also the so called Growth and Transformation Plan (GTP II) of the government of Ethiopia.

In this process, the role of supply chain is paramount which is defined as

> *"the process used by not-for-profit or donor funded organizations to plan, implement, control the efficiency, cost effective flow and storage of goods and materials as well as related material, from the point of origin to the point of consumption for the purpose of alleviating the suffering of the most vulnerable and most at risk people. The function encompasses a range of activities, including preparedness, planning, procurement, and transporting, warehousing, tracking and tracing and custom clearance" (Oloruntoba. and Gray 2006).*

Despite increase in demand for humanitarian assistance in different parts of the world, humanitarian organizations are experiencing a number of supply chain management challenges (Kovács and Spens 2009). For example, according to Ergun et al. (2009) supply chain management challenges that humanitarian organizations face include frequent turnover of employees, level of knowledge of humanitarian organizations and capacity of the stakeholders, dilemma of donors in terms of providing funds for the humanitarian operations. Moreover, Kinyua (2013) identified supply chain challenges of humanitarian organizations which are related to supply chain coordination, capacity of local transport, warehousing capacity, facility at the port and government policies.

It is known that challenges associated with supply chain can lead to delays in delivery of humanitarian supplies to the affected people and increasing cost which ultimately leads to huge loss of life (Nyamu 2012).

The entire processes require efficient humanitarian supply chain management which plays paramount contributions for procurement and transport of food commodities from its origin to final destinations where it is proposed to be consumed or utilized. In this paper, the researcher will attempt to assess humanitarian supply chain challenges that WFP Ethiopia experiences and their effect on operations of the organization.

1.2 Statement of the problem

The last few years have brought many challenges to humanitarian organizations due to increase in type and number of disasters and crises in the world which requires the interventions of humanitarian aid organizations to save the lives of the victims (Kinyua 2013). According to Yigezu (2016), Ethiopia has experienced drought and other disasters during the past three decades which have affected the livelihood of the people causing disruption of sustainable incomes. According to reports of National Risk and Disasters Management Commission of Ethiopia (2017), over 10.2 million people in the country were in need of humanitarian assistance during 2016/2017 due to recurring drought. In this respect, the existence of humanitarian organizations for any emergency or humanitarian response or assistance is absolutely necessary in reducing the suffering of people.

> *"Currently, the humanitarian response has become very complex due to diversified nature of different stakeholders involved and the environment in which the humanitarian organizations operate. On one hand, there is public sector such as government agencies and local authorities. On the other hand, there are private sectors, service providers, goods suppliers and individuals. In between, there is the international community and the large and small aid agencies. Lastly, there are the societies at large, which, regardless of their condition after the disaster, are exposed to unexpected changes" (Tomasini & Wassenhove, 2009).*

Tomasini & Wassenhove (2009) further indicated that stakeholders involved in supply chain management of humanitarian assistance have different roles and expectations which should be addressed in coordinated and matured approach to create effective outcome. In doing so, the role of effective supply chain at every stage is very critical for optimal utilization of resources and in fulfilling the need of end beneficiaries.

Many scholars have carried out research works in the field of humanitarian supply chain management. However, having reviewed various articles and literatures in the area of humanitarian supply chain management, much focus has not been given to address the challenges of humanitarian supply chain management in emergency or relief operations and their impacts on operations of humanitarian organizations particularly in Ethiopia.

Kovács and Spens (2009) did a research on challenges of humanitarian supply chain management and the findings of the study indicated that challenges facing humanitarian organizations have been identified with respect to different types of disasters, phases of disaster relief and the type of humanitarian organizations.

As stated in the finding of the study, coordination among humanitarian actors, inadequate infrastructure, uncertainty of demand, lack of knowledge and inadequate training are humanitarian supply chain challenges. The study was carried out in the context of Ghana and the challenges that humanitarian organizations face differ from one country to another. In addition, environment in which humanitarian organizations operate was country specific. Nyamu (2012) also made a study in Kenya to assess challenges that humanitarian organizations face in supply chain management. Based on the finding of the study, the challenges identified were lack of recognition of the role of supply chain management in humanitarian operations, delays in humanitarian operations due to domestic barriers, demand uncertainty, challenges in accessing affected population due to inadequate transportation modes and high costs inhibiting accessibility of the affected areas and inability to anticipate disaster. These challenges are applicable to specific humanitarian environment; Kenya and their applicability in Ethiopia context have not been assessed.

Furthermore, Kinyua (2013) conducted a study to address factors affecting supply chain management of humanitarian organizations in Kenya. In this research paper, many factors affecting supply chain of the humanitarian organizations have been identified but in the context of Kenya.

A study carried out by Pateman, Hughes, and Cahooh (2013) on a synthesis of key challenges of humanitarian supply chain and the finding of this study indicated that collaboration is challenging due to the fact that managing disaster is very complex as it involves many actors and the study was in Asian context.

Overall, studies focusing on assessing humanitarian supply chain management challenges in the context of WFP Ethiopia are limited with exception of Kim & Singha (2010). The aforementioned study by Kim & Singha (2010) did not address supply chain management challenges in a comprehensive approach rather it largely focused on assessing supply chain capacity of WFP Ethiopia in transporting food aid. This indicates that there is clearly a research gap since assessing humanitarian supply chain (HSC) management challenges that WFP Ethiopia experiences and potential coping strategies have not been fully addressed. Moreover, Ethiopia is a landlocked populous agrarian country often affected by drought with food insecurity crisis. In this respect, the country is facing unique challenges in its humanitarian supply chain management which in turn influence the operations of humanitarian organizations in the country including WFP.

Therefore, study focusing on the assessment of supply chain management challenges in the context of Ethiopia particularly WFP is highly needed since it is the largest humanitarian organization providing food assistance and in this respect, WFP Ethiopia faces many supply challenges during its daily operations which have not been researched. The result of this study is also anticipated that it can be a good input in the improving supply chain management of WFP Ethiopia and other related humanitarian organizations.

1.3 Research questions

The main research questions that will be addressed in this study are the following;

- What are the challenges that WFP Ethiopia experiences in humanitarian supply chain management?
- What are the effects of humanitarian supply chain challenges on operations of WFP Ethiopia?
- How will WFP Ethiopia address the challenges associated with humanitarian supply chain challenges such as coordination, information integration, lack of local transport capacity, port congestions and warehouse capacity

1.4 Objectives of the study

The general objective of this study was to assess WFP`s supply chain management challenges The specific objectives of the research work were to;

- Assess and describe challenges that WFP Ethiopia experiences in supply chain management
- Assess how supply chain management challenges influences operations WFP Ethiopia
- Find out coping strategies that WFP Ethiopia apply to address the challenges associated with humanitarian supply chain challenges such as coordination related, information and communications integration, inadequate transport capacity, port congestions and custom clearance and inadequate warehousing.

1.5 Significance of the study

In Ethiopia, the study of humanitarian supply chain management challenges and how these challenges hamper operations or performance of aid organizations have not sufficiently been addressed. The findings of this research work will provide insight of supply chain management challenges in humanitarian context in Ethiopia. A number of people and institutions may benefit from findings of the study which includes supply chain managers/experts, senior managers of WFP, other humanitarian organizations operating in the country, government, donors and academicians. The findings may also be used as a baseline and reference material for future researchers who intend to carry out study on humanitarian supply chain management challenges of humanitarian organizations in Ethiopia.

1.6 Delimitation and Limitation of the study

The main focus of the study is to assess supply chain management challenges of WFP Ethiopia. In view of this, the study is geographically delimited to an organization in Ethiopia and humanitarian sector.

The main limitation of the study was unavailability of well documented and organized secondary data particularly research works in the areas of humanitarian supply chain management in the country. Moreover, collection of primary data through survey questionnaire was a challenge due to the fact that the physical presence of respondents is located in 10 locations or duty stations in the country.

1.7 Conceptual Definitions

The conceptual definitions of factors influencing supply chain system in many operations are stated below.

1. **Coordination**:

   It is the relationships and interactions among different actors operating within the relief environment(Balcik et al. 2010).

2. **Information and communication**:

   An information system is a set of interrelated components that collect or retrieve, process, store, and distribute information to support decision making and control in an organization. In addition, supporting decision making, coordination, and control, information systems

may also help managers and workers analyze problems, visualize complex subjects, and create new products. (http://www.uotechnology.edu.iq/ce/Lectures/SarmadFuad-MIS/MIS_Lecture_3.pdf).

3. **Local Transport capacity**: Transport is a means through which both commercial and humanitarian supplies reach the locations where they are needed(Balcik et al. 2010)
4. **Port congestion and custom clearance**:

   Port congestion is delays, queuing and extra time of voyage and dwell of ships and cargo at the port that affect the entire logistics and supply chain system which may result in lengthy time and extra costs to all stakeholders(Gidado 2015).
5. **Warehouse facility and capacity:**

   Storage or warehouse facilities are locations where food and non-food commodities are stored pending onward movement (https://reliefweb.int/sites/reliefweb.int).
6. **Performance**:

   It is the ability of supply chain to meet end customer needs through planning and management of all activities related to material, information, financial flows, and co-ordination and collaboration with supply chain members, across humanitarian aid organizations(Willner and Zafeiridis 2010)

1.8 Organization of the Paper

The paper is organized into five chapters. Chapter one deals with background of the study, statement of the problem, research questions, objectives of the study, significance of the study, delimitations and limitation of the study and definition of conceptual terms. Chapter two focuses on various theoretical and empirical literature works carried out in the past and is a foundation for the study. Chapter three focuses on research methodology that focuses on selection of study design, sampling techniques, data collection methods and analysis. Chapter four presents results and discussion of data. Finally, chapter five presents summary of the research finding, concluding remarks and recommendations for action required in future.

CHAPTER TWO

2 Literature Review

2.1 Introduction

In this section, the researcher has carried out a review of the works of various scholars in the area of supply chain management, humanitarian supply chain management and humanitarian performance measurement to obtain insights of the discipline, developed conceptual framework.. It focuses on defining concepts such as supply chain management, humanitarian supply chain management, humanitarian supply chain challenges and their effect on operations and performance of humanitarian organizations. Moreover, empirical review related to the topic of the study has been carried out to support the conceptual framework.

2.2 Overview of Supply chain management

In today`s world, business environment has changed and every organization or company operates in a dynamic and fast moving environment due to the impact of globalization and other inevitable factors such as improve in technological level, competition, high customer demands and geopolitical factors (Lu 2011). An organization focused management approach that existed for several years is no longer adequate and supported by the new business environment to deliver the required goods and services to customers since businesses are part of the supply chains and it is the supply chain that wins or loses the competition (Lu 2011).

Lu (2011) further indicated that business continuity and success is no more results of competency of an organization or internal strength and quality to compete but the ability to establish cooperation among other businesses with in the supply chain. Lu (2011) defined supply chain as

> *''a group of inter-connected participating companies that add value to a stream of transformed inputs from their source of its origin to end products or services that are demanded by designated end-consumer''.*

Supply chain management plays a vital role in strengthening effective and efficient management of scarce resources to allow companies and organizations achieve the set goals (Simehi-Levi, Kaminsky, and Simehi-Levi 2004). Simehi-Levi et al. (2004) defined supply chain management as approaches used for

efficient integration of resources to produce and avail supplies to users through coordinating many supply chain stakeholders in the system. Stadtler (2004) further explained Supply chain management as the task of integrating organizational units along a supply chain and coordinating materials, information and financial flows in order to fulfill ultimate customer demands with the aim of improving competitiveness of the supply chain as a whole.

2.3 Humanitarian Supply Chain Management

The level and complexity of both natural and man-made disasters are increasing in the world affecting the livelihood of many people. Pateman et al. (2013) defined a disaster as a serious disruption of functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources. To manage and reduce suffering of the affected people, effective and efficient supply chain plays a fundamental role.

Oloruntoba and Gray (2006) defined

> *"humanitarian Supply Chain Management as a process used in not-for-profit or donor funded organizations to plan, implement, control the efficiency, cost effective flow and storage of goods and materials as well as related material, from the point of origin to the point of consumption for the purpose of alleviating the suffering of the most vulnerable and most at risk people. The function encompasses a range of activities, including preparedness, planning, procurement, and transporting, warehousing, tracking and tracing and custom clearance."*

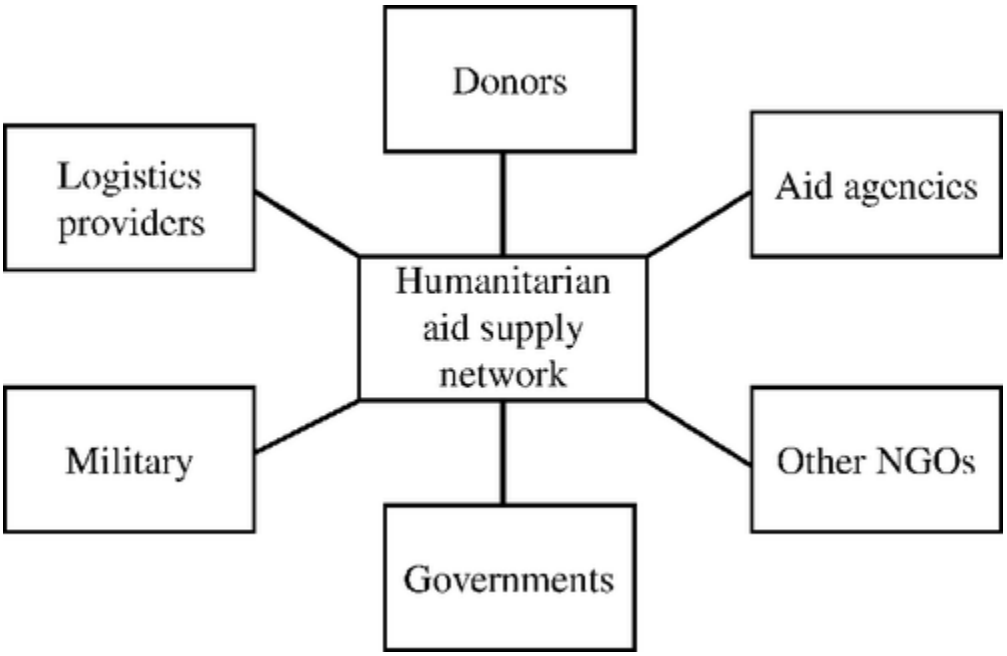
2.4 Actors in Humanitarian Supply Chain network

According to Oloruntoba. and Gray (2006) humanitarian relief community has widely developed and expanded both in number and type after the second world war. It includes multilateral agencies such as the United Nations High Commission for Refugees (UNHCR) and the WFP which are entirely funded through voluntary contributions mainly by governments both in cash and in kind, as well as a wide range of NGOs both national and international. In addition Balcik et al. (2010), indicated that humanitarian relief environments involve international relief organizations, host governments, the military, local relief organizations, and private companies, which each may have different interests, capacity, mandates and logistics expertise. In relation to this, Balcik et al. (2010) indicated that the number of countries and non-

governmental organizations which took part in providing humanitarian assistance for 2004 Asian Tsunami were 40 and 400 respectively.

This indicates that no single actor or organization has sufficient resources to respond efficiently to a major disaster. Hence, it is evident that lack of coordination, collaboration among supply chain players result in humanitarian supply chain inefficiencies (Oloruntoba and Gray 2006).

Figure 1: **Actors in the supply chain network of humanitarian organizations**



Source: **(Kovács and Spens 2007)**

2.5 Business versus humanitarian organizations

As stated by Wassenhove (2006), the attention given to humanitarian supply chain management compared to supply chain in private sector was not considered important However, some humanitarian organizations started giving attention to humanitarian supply chain management. According to Beamon and Balcik (2008), the main objectives and presence of humanitarian organizations in any country are to provide humanitarian assistance and supplies. In this regard, Balcik and Beamon (2008) identified a number of

differences between humanitarian supply chain management and supply chain management in commercial sector which are explained below;

- Sources of revenue- humanitarian organization usually fund their operations through contribution received from donors and governments. The contributions can be in the form of cash and goods or commodities which enable the humanitarian organizations perform their activities and meet the needs of end users. On the other hand, the sources of revenues of profit making companies is generated from sales of services and goods to customers
- Goal- in terms of goal, organizations or companies operating in private sectors are usually engaged in making profit to maximize financial returns to owners of the business. In case of humanitarian organizations, the goal is to save lives of disaster victims by providing humanitarian assistances.
- Performance Measurements- approaches applied to measure performances of both profit making and humanitarian organization are different. In case of profit making organizations, performance measurement is not complicated as financial data are used to measure the performance. Profits are measured easily and they are a good test of market-need satisfaction and an organization's ability to operate efficiently. The challenges identified for performance measurement in the nonprofit sector include the intangibility of the services offered, immeasurability of the missions, unknowable outcomes, and the variety, interests, and standards of stakeholders.

Beamon and Balcik (2008) also stated the importance of performance measurement in humanitarian organizations due to increasing competition from a number of aid agencies competing for scarce donor funding and increased demands for accountability of donors, the media, and the public in general.

In summary, the main differences between commercial and humanitarian supply chains are: the unpredictability of demand in terms of timing, location, type, and size, the large amount of demand in a combination with short lead times, high stakes associated with adequate and timely delivery, as well as the lack of resources regarding supply, people, technology, transportation capacity and money (Beamon and Balcik 2008) and (Kovács and Spens 2007)

Pateman et al. (2013) further indicated that characteristics of customers, strategic goals of the organizations, nature of demand and environmental factors as sources of differentiation between business supply chain and humanitarian supply chain identifying the following as dominating characteristics. These include unpredictability of demand in terms of timing, location, type and size, suddenly-occurring demand

in very large amounts and short lead time for a wide variety of supplies, high stakes associated with adequate and timely delivery and lack of resources such as supply, people, technology, transportation capacity and money.

The operational environment of the humanitarian supply chain and the commercial supply chain differ significantly. The commercial supply chains have to deal with somewhat predetermined set of suppliers, manufacturing sites and predictable demand, but these terms are not the same for the humanitarian supply chains (Kovács and Spens 2007).

Table 1: Summary of major difference between humanitarian and commercial supply chain management

Bases of differentiation	**Humanitarian**	**Business or Commercial**
Goals	reduce loss of life and alleviate suffering	Produce high quality product at low cost, maximize profitability and increase customer satisfaction
Nature of Information system	Information is usually unreliable, incomplete, non-existent	Well-defined, uses advanced technology
Demand	Supplies and equipment. Demand is unstable, unpredictable in terms of time, type and size/ estimation	Product. Demand is stable and predictable
Inventory Control	Challenging due to high variations in lead time, demands and demand locations	Well defined methods determining inventory level which is based on lead time, demand and target customer level
Lead times	Zero time between occurrence of the demand and need for the demand	Determined by supplier-manufacturer-distribution center-retailer chain
Performance measurement	The focus is on output in terms of response time and ability to meet the needs	Maximize profit or minimize cost

Sources: (Kovács and Spens 2007), (Pateman et al. 2013) and (Beamon and Balcik 2008)

2.6 Humanitarian Supply Chain Management Challenges

In today`s world, the number and type of disaster are increasing at alarming rate affecting the livelihood of many nations (International Federation of Red Cross 2010). Humanitarian organizations need to be better prepared in all aspects to respond to the disasters in providing necessary assistance timely to those in need through efficient humanitarian supply chains (Nyamu 2012). However, these organizations face many challenges that must be acknowledged. The following challenges of humanitarian supply chain management were discussed in this section; challenges in coordinating and managing supply chains among multiple players, challenges related to information and communication management, challenges related to transportation and accessibility, port congestion & custom clearance and warehouse or storage facility.

2.6.1 Supply Chain Coordination challenges

According to Balcik et al. (2010), there are a number of players and actors involved in humanitarian relief environments. These actors are international relief organizations, host government, the military, local and regional relief organizations, and private sector companies. Roles, areas of expertise and focus areas of these actors differ in the entire process of humanitarian supply chain. Apparently, a single actor may not have the required resources in terms of human capital, funding sources and other resources to respond effectively to any disasters, hence the need for coordination is relevant.

Balcik et al. (2010) further described coordination as the fundamental and core element of supply chain management. The objective of humanitarian supply chain is to effectively respond to both man-made and natural disasters. These disasters are very common across the world and can cause loss of lives, shortage of food and water and other serious damages. Hence, the coordination among humanitarian organizations and other stakeholders is a necessity and fundamental during such situations due to the fact that a single organization is not in a position to meet and fulfill the entire demands of people affected by disaster such as providing food, water, medicines and other basic supplies (Akhtar, Marr, and Garnevska 2012). These organizations usually share the resources they mobilize for the purpose of responding to humanitarian assistance and work together to achieve their objectives. This system of interdependency is called coordination (Akhtar, Marr, et al. 2012). Balcik et al. (2010) defined the term coordination as “the relationships and interactions among different actors operating within the relief environment”.

According to Akhtar et al. (2012), there are many factors affecting coordination process of humanitarian environment. These include nature and magnitude of the disaster, expertise of actors involved in the coordination and insufficient resources. Balcik et al. (2010) also itemized a number of factors affecting humanitarian supply chain coordination which include; number and diversity of actors, donor expectations and funding structure, competition for funding and the effects of the media, unpredictability, resource scarcity and cost of coordination.

2.6.2 Information and communication management challenge

Information systems have brought substantial contributions to the business world in terms of integrating the entire resources of an organization and improves business processes and operations. It also enhances decision making process and create opportunities for competitive advantage (O'Brien and Marakas 2009).

O'Brien and Marakas (2009) further indicated that the world is very dynamic and changing hence efficient and effective management of resources such as raw materials, intermediate goods and finished goods all depends on availability of relevant and timeless information and knowledge. Kovács and Spens (2011) stated the use of information integration in humanitarian supply chain improves supply chain processes that involve procurement, transport, storage and distribution of supplies to beneficiaries. It also enhances and enables proper functioning of humanitarian supply chain and coordination among supply chain actors throughout the entire operations. Failure to integrate the most required and appropriate information within a given time period results in supplying wrong supplies and quantity and location (Howden 2009). Kinyua (2013) further stated that availability of relevant information and proper management of these information increase the confidence and capacity of humanitarian organizations in responding to uncertain disasters on timely manner.

In the general supply chain context, the role of information management in the course of providing humanitarian assistance is not simple particularly in terms of tracking and providing the status of humanitarian supplies. The effective and efficient information management also reduces wastage of supplies and enables humanitarian organizations timely delivery the supplies to beneficiaries (Liu 2013). It was further indicated that use of geographical information system contributes to identifying damaged areas and all available resources to minimize risks resulted from unavailability of information. The manual nature of supply chain management in humanitarian aid and disaster relief sector may have impacts and

hamper the delivery of relief aid which in turn affects the performance of any humanitarian organizations (Thomas and Kopczak 2005).

2.6.3 Inadequate Local transport capacity

Transport is a means through which both commercial and humanitarian supplies reach the locations where they are needed (Balcik et al. 2010). In light of this, the report of Ethiopia Road Authority indicated that Ethiopia is one of the landlocked countries in Africa making the country`s socio-economic development to rely on road transport to carry goods and service from ports and throughout the country. Transportation is a major component of disaster relief operations but challenging for relief agencies due to damaged infrastructure, limited transportation resources and bulk of supplies to be transported (Balcik et al. 2010). Another challenge for relief organizations is in obtaining sufficient information regarding current road conditions. This is because communication and information technologies that would support in-country transportation may not be available (Balcik et al. 2010). A humanitarian transport plan must not only take into account the means of transport but also the actual possibilities of getting supplies from point origin to destination point as well as alternatives for the prompt, safe delivery of relief assistance (Kinyua 2013). In real terms, there are challenges with transporting food from the port to final delivery points which may hamper humanitarian response due to delay in transporting the supplies.

2.6.4 Port Congestion and custom clearance challenges

According to Gidado (2015), congestion in any ports is usually attached to delays, queuing and extra time of voyage and dwell of ships and cargo at the port affecting the entire logistics and supply chain system. This results in lengthy lead time and extra costs to all stakeholders such as transport service providers and traders in the supply chain. Gidado (2015) further indicated that transporting goods by sea remains the most common way to trade globally despite the fact that cargos in Africa spend unnecessary and long time in ports before they are moved inland, creating obstacle to the successful integration of Africa`s economies in worldwide trade networks. Gidado (2015) also identified common types of congestion prevalent in Africa which include ship berth and work congestion, vehicle gate and work congestion, cargo stack congestion and ship entry / exit route congestion.

In case of Ethiopia, Port Djibouti is the main route for import and export business including cargos of humanitarian organizations (Kim and Singha 2010). According to WFP internal report, 90% of WFP

Ethiopia cargo is through Djibouti port resulting in involvement of many stakeholders including clearing agents and port agent service providers. Successful port operations require carefully-prepared planning in consideration of expected congestion problems which Djibouti port is currently experiencing. This has major impact in terms of cost and time implications that this can have on humanitarian operations in Ethiopia.

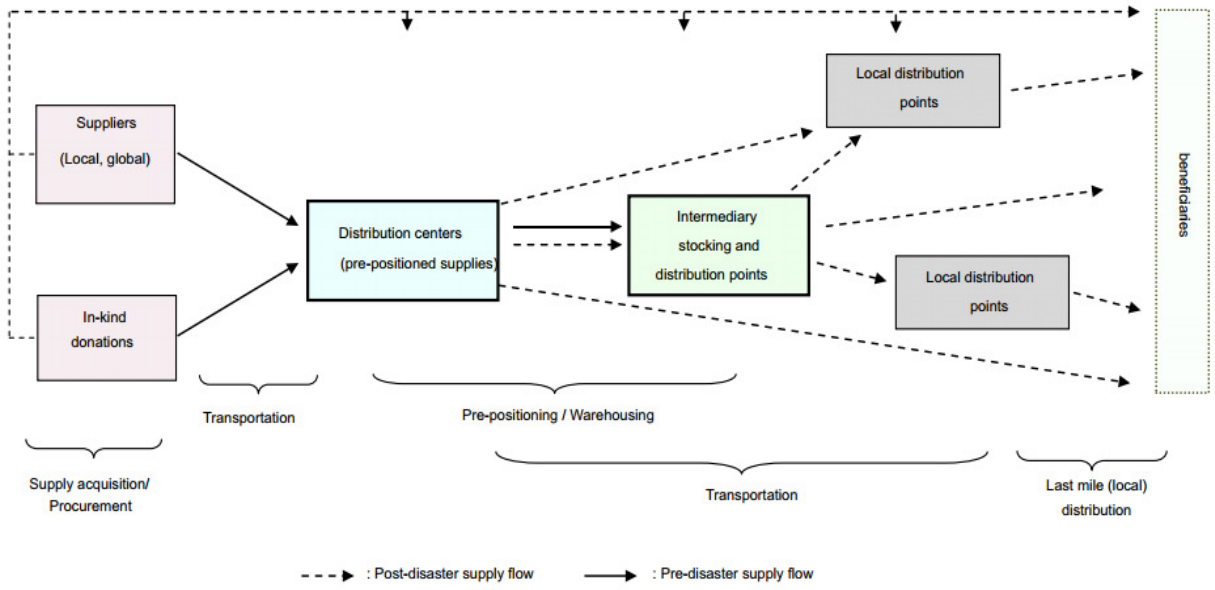
The port of Djibouti is a crucial transit location for almost all cargos that enter and exit Ethiopia and is also a key commercial transport route for the greater Horn of Africa (Kim and Singha 2010). The port facilitates effective and efficient flow of humanitarian aid many organizations though many bottlenecks encountered. In just a three-year period it has been stated that up to four million metric tons of relief goods have passed through Djibouti destined for neighboring countries.

2.6.5 Inadequate Warehouse or storage facility

Warehousing is a facility where supplies are stored until they are distributed to end users or decisions are made on how to utilize the supplies by responsible entity within the chain (Balcik and Beamon 2008). The purpose of creating storage or warehouse facility is primarily to manage and protect the humanitarian supplies in organized way until they are delivered to beneficiaries. Humanitarian storage must also take into account reserve supplies for future or unforeseen needs (Balcik and Beamon 2008).

Humanitarian organizations that procures humanitarian supplies a head of disasters strategically keep or pre-position the supplies at distribution center. However, this approach is affected by level of funding sources, uncertainty of disaster occurrences and high operational costs associated with managing distribution centers, hence the strategy is used by limited number of humanitarian organizations (Balcik et al. 2010). The level or points at which various humanitarian supplies are pre-positioned can be global, regional or in country (see figure below). Storage facilities at airports and seaports are commonly used for this purpose though it is not easy for humanitarian organizations to find secured, affordable, undamaged local warehousing and storage facilities (Balcik et al. 2010).

Figure 2: Typical Supply Chain structure of humanitarian organization



Source: (Balcik et al. 2010).

2.7 Humanitarian Supply Chain Performance

The objectives of humanitarian organization are providing humanitarian assistance such as food, water, medicine and supplies that benefit the victims of any disasters. Performance of humanitarian supply chain is expected to be efficient and effective to meet the demands of victims of many beneficiaries and also create confidence for donors to fund the operations(Beamon and Balcik 2008).

Haavisto and Goentzel (2015) defined performance measurement as an approach to obtain relevant information and analyze the information for verification if the performance is in line with the established standard and operational plan of an organization. Furthermore, performance measurement is a tool which is applied in any organization to quantify results of the operations or measure performance and gives feedback on the outcome of the entire process. Balcik and Beamon (2008) and Kovács and Spens (2007) defined a performance measurement as a tool established to quantify the effectiveness and efficiency of an organization while operating in any environment. Effectiveness is the level at which organizational goals ae met in terms of providing assistances while the efficiency is the measure of how economically the resources are utilized when providing a humanitarian assistance. According the authors, bases of measuring performance of humanitarian organizations are response time, service quality, technical and cost efficiency.

Balcik and Beamon (2008) explained the importance of effective performance measurement in humanitarian organizations that it helps non-profit managers make better decisions, improve performance, and provide accountability. In addition to this, effective performance measurement allows to obtain feedback on performance of those humanitarian organizations, create motivation to leaders and employees to contribute to the success of the organizations. Hence, the importance of performance measurements cannot be underestimated since they affect the organization at strategic, tactical, operational and control level. Moreover, performance measurements not only contribute to setting objectives and evaluating performance but also to determining future plans and actions (Balcik and Beamon 2008)

The performance of humanitarian organizations can be poor creating bad image when the organizations are faced with a number of supply chain challenges unless the challenges are adequately flagged. Humanitarian supply chain challenges are among those challenges which may seriously affect the performance of an organization and result in seizing the operations by the organization.

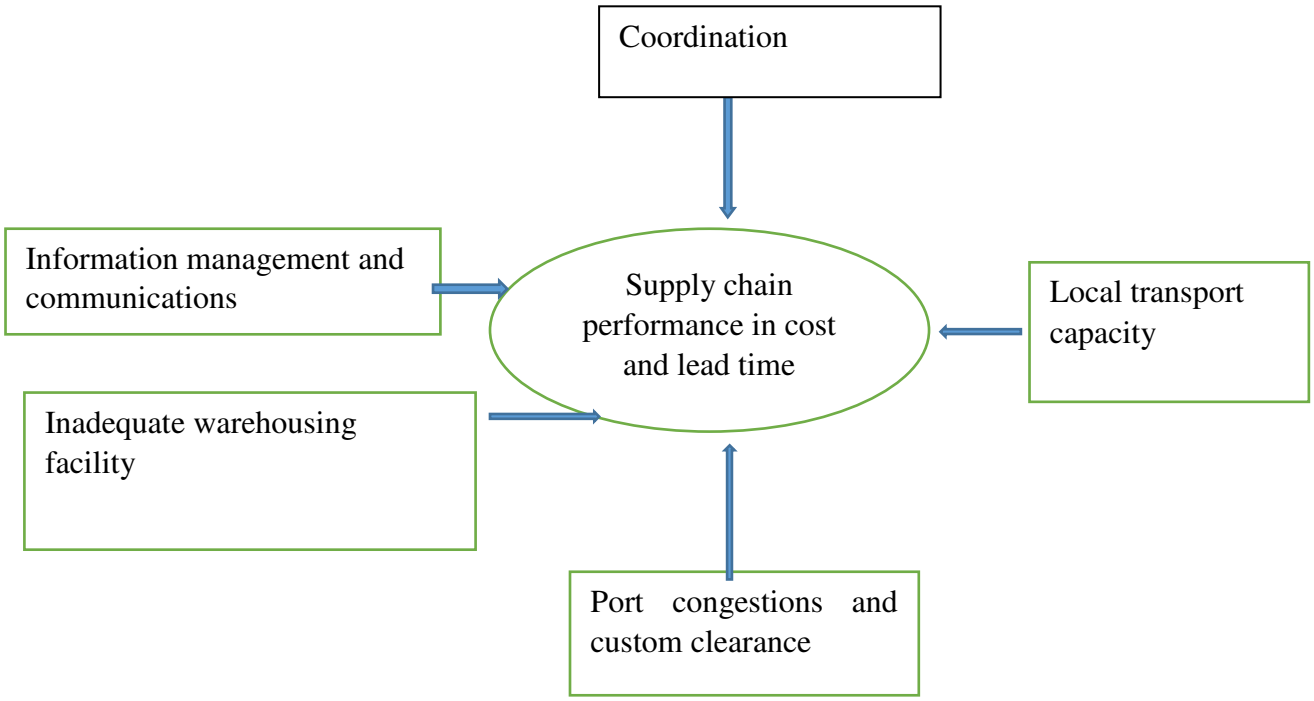
In summary, supply chain management challenges in humanitarian environment may also hinder humanitarian organizations not to deliver the required humanitarian supplies to beneficiaries under the six principles of rights of a supply chain i.e. right place, right product, right quality, right time, right cost and right delivery (Kinyua 2013).

2.8 Conceptual Framework

Supply chain management challenges have impacts on the operations and efficiency of humanitarian organizations. Researchers in the field of humanitarian supply chain management have identified many challenges affecting performance of humanitarian organizations. This study assessed supply chain management challenges of WFP Ethiopia in the course of providing humanitarian assistances and responding to humanitarian crisis in the country.

Humanitarian supply chain management challenges influence operations and performance of humanitarian organizations in terms of many factors such as time to respond to crises and operational costs. Referring to following figure, many challenges have been identified through review of various journals and literatures in the areas of the topic of the study which may affect the operations of supply chain management of humanitarian organizations. Challenges identified in the framework of the present study consist of the following: supply chain coordination challenges, information management challenges, limited capacity of local transport, congestion at the port and custom clearance, inadequate warehousing facility.

Figure 3: Conceptual framework of the study



Source: Modified by the Researcher from Nyamu (2012) **and** Kinyua (2013)

2.9 Summary of research gap

In providing humanitarian assistances to victims of any disasters in any country, humanitarian supply chain management is fundamental and it plays key roles in utilization of scarce contributions and grants meant for humanitarian expenditures. A number of challenges affecting humanitarian supply chain system have been identified in the context of various countries and depending on types of disasters. In light of this, there is a need to assess the challenges that WFP Ethiopia faces in humanitarian supply chain management in the course of providing humanitarian assistance to beneficiaries.

CHAPTER THREE

3 Research Methodology

3.1 Introduction

This chapter presents the research methodology that was used to achieve research objectives and answer research questions of the study. Among all, research design, research approach, data gathering techniques or instruments, data type used and sources of data for the study were discussed. Moreover, target population of the study, data analysis techniques, validity and reliability of the study along with an appropriate justification were also discussed.

3.2 Research Design

Saunders, Lewis, and Thornhill (2009) defined research design as a general plan a researcher uses in answering established research questions. The research design contains clear and accurate objectives which is derived from the research questions. It specifies the sources from which a researcher intends to obtain and collect relevant data that support the study and also indicate the constraints that a researcher inevitably faces such as access to data, time, location and money as well as discussing ethical issues.

This study assessed factors affecting humanitarian supply chain management in Ethiopia with particular emphasis to WFP Ethiopia and the study followed analytical procedures to describe supply chain challenges that humanitarian aid organizations including WFP experience in the country.

Therefore, the present study followed a descriptive and cross-sectional type since descriptive study is used to collect data from one or more groups, and then analyzes it in order to describe present conditions.

3.3 Target Population

The study targeted WFP Ethiopia, one of the United Nations agencies engaged in providing humanitarian assistance in the country. 100 employees of WFP Ethiopia based in Addis Ababa and sub or branch offices who are directly engaged and involved in supply chain management of relief and emergency response were targeted group to provide primary data. Specialists and experts from supply chain and other functional areas were the population of the study due to the fact that they all can involve in supply chain management

of the organization such as planning, procurement, transportation, warehousing and custom clearances. In addition, 30 supply chain specialists and experts from NDRMC, one of WFP`S strategic partner in Ethiopian emergency response, were the target population as both WFP and NDRMC work together in responding to humanitarian crisis in the country.

3.4 Data type and sources

The data types used in the current study were both quantitative and qualitative collected from both primary and secondary sources to achieve the research objectives.

The primary data collection involved: (1) informative interviews with relevant senior managers in WFP Ethiopia (Country Director, Head of supply chain unit and three Logistic Officers) and one person at similar position from WFP `s strategic partner in the government of Ethiopia (NDRMC), and (2) self-completed questionnaire survey involving employees of WFP Ethiopia and NDRMC was prepared in line with survey of different literatures Kinyua (2013), Agwata (2014), Akhtar, N.E, and Garnevsak (2012) and this was carried out to meet the objectives of the study.

The questionnaires were distributed in hard copy to selected respondents based in Addis Ababa and electronic mails for those based in branch offices. The secondary data were from both internal sources (supply chain database, periodic reports, documents intranet) and external sources (humanitarian reports from Ethiopia) were obtained and used for the study. Assessment of coping strategies with regard to supply chain management challenges was carried out using key-informant interviews.

3.5 Data collection tools

In any study, primary data are obtained and collected through various data collection tools; a self-completion questionnaire and conducting informative interview. For this particular study, questionnaire was developed based on various aspects of humanitarian supply chain management challenges which are in line with existing literatures. The questionnaire was administered to employees of both WFP Ethiopia and NDRMC who are supply chain specialists and experts and who also involved in supply chain management. This ensured to obtain valid and reliable data from all respondents since they have adequate knowledge and experience in supply chain management in humanitarian context. Another tool used to collect primary data

was key informant interview which was conducted to collect additional information that supports the results of questionnaire survey on supply chain management challenges. Five key informant involved in the interview process from both WFP and NDRMC.

In addition, secondary data were obtained through review of published & unpublished materials, internal and external reports of WFP, NGOs/government and its cooperating partners, various journals& articles and books. Database and website of WFP has also served as secondary data sources.

3.6 Method of Data Analysis

The researcher used statistical technique to analyze quantitative data collected through survey questionnaire which is descriptive statistics. The descriptive statistics involved analysis of frequency distributions, measure of central tendency, data variability and correlation to describe the features of the survey data. . The data collected through survey questionnaire were coded and entered into the Statistical Package for Social Science (SPSS) program. The answers were coded using unique variables such as 1, 2, 3, 4, and 5 and number 999 was used to represent all values which were not relevant for the respondents. The advantage of this technique was that it enabled the collected data to be entered relatively fast and simplified further analysis of the data to produce various statistical figures.

The data obtained from the interviews were analyzed through narration and quoting important concepts of the interviewees. The researcher used data obtained from secondary sources to triangulate both quantitative and qualitative sources to ensure the consistent results.

3.7 Validity and Reliability of Instruments

Validity and reliability are two basic concepts that are essential to define and measure bias and distortion of results of any study.

In order to ensure validity of the study, the researcher conducted interview with targeted group, prepare questionnaire to obtain views of the respondents, consult relevant documents, databases and intranet. In addition, information from secondary data was also used along with responses to interview and survey questions which were double-checked and triangulated to ensure validity of data.

In order to ensure the reliability of the data that were used for the study, the researcher obtained data from multiple sources such as primary and secondary which made the data dependable and reliable. Moreover, the researcher used questionnaire as data collection tools by capturing and including as many relevant questions as possible and triangulate the results with other data sources to increase the reliability of the results of the study. The respondents were staff of WFP Ethiopia Country office who are directly engaged in supply chain management and having experience and knowledge of the operations. Selected supply chain specialists of NDRMC were also part of the study that provided relevant facts related to supply chain management challenges. This process made the study more reliable and avoids inconsistency and avoids bias.

CHAPTER FOUR

4 Results and Discussion

This chapter presents results and discussion of the study conducted on assessment of supply chain management challenges of WFP Ethiopia. The findings have been analyzed and presented in the form of descriptive statistics such as frequencies, mean, standard deviations and correlation. The results of the study were presented in two main parts: questionnaire survey and key-informant interviews or analysis of qualitative data. Furthermore, the findings of the study were interpreted and discussed in line with research objectives.

4.1 Analysis of Questionnaire Survey

The results of the primary data obtained through questionnaire survey from employees of both WFP and NDRMC about supply chain management challenges of WFP Ethiopia were presented after describing the response rate and validity of the questionnaire survey. The main parts of the results of the questionnaire survey related to general profile of the respondents and the various challenges of the humanitarian supply chain management.

4.1.1 Response rate

The questionnaire survey in the present study targeted a total of 130 employees working in WFP Ethiopia and its main strategic partner, NDRMC. Questionnaire format was distributed to 100 employees of WFP Ethiopia and to 30 employees of NDRMC. In this regard, 93 respondents returned the filled questionnaire from WFP and 19 from NDRMC. Accordingly, the response rate was 86% and this indicates that response rate was considered to be sufficient and representative. Mugenda, O.M and A.G (2003) stated that if the response rate to a questionnaire survey is 70% and above, it is considered to be very good for analysis and reporting. In this regard, the response of rate of the present study was found to be very good for further analysis. High response rate was attained due to existing good communications with colleagues and strong information flow in WFP system. The researcher also made very good effort by reminding the respondents through email, making a visit and phone calls.

4.1.2 Reliability test

Factor analysis has been conducted using principal component method to see how items were loaded into their respective variable or construct. Only items which are loaded for greater than 0.7 were considered for further analysis. In this regard, there is reasonably good correlation among items in each variable. This indicated that all the items measure the same construct and gave strong evidence of convergent validity. The Cronbach's alpha coefficient for the 36 items was calculated and found to be acceptable (0.899) which indicates that there exists internal data consistency.

Table 2: Reliability Statistics

Variable	Item	Factor load	Cronbach's Alpha
Coordination	AA1	0.834	0.913
	AA2	0.755	
	AA3	0.9	
	AA4	0.865	
	AA5	0.75	
	AA6	0.804	
	AA7	0.777	
Information management	BB1	0.863	0.772
	BB2	0.82	
	BB5	0.831	
	BB4	0.705	
Transport	CC1	0.793	0.85
	CC2	0.86	
	CC3	0.877	
	CC4	0.867	
	CC5	0.507	
Port related challenges	DD1	0.774	0.863
	DD2	0.846	
	DD5	0.852	
	DD6	0.878	
	DD7	0.753	
	DD8	0.782	
rehouse related challeng	EE1	0.76	0.818
	EE2	0.712	
	EE3	0.828	
	EE4	0.77	
	EE5	0.782	
Performance	PP2	0.89	0.884
	PP3	0.889	
	PP4	0.736	
	PP5	0.773	
	PP6	0.828	

Source: Research Data (2018)

4.1.3 General Information of respondents

Table 1 summarizes general characteristics of respondents such as gender, age, educational qualifications, employing organization, current position/title, and length of work experience, duty station, and functional unit or areas of experts. Total number of targeted population was 130 respondents from both WFP Ethiopia and NDRMC. Out of total respondents, 100 were from WFP Ethiopia and the rest were from NDRMC.

Table 3 : **Profile of the respondents (n=112)**

Variables	Categories	Frequency/Number of Respondents	Percent
Gender	Female	34	30.4
	Male	78	69.6
Age (years)	20-30	18	16.1
	31-40	47	42
	>40	47	42
Education status	Grade 12 completed	1	9
	College Diploma	12	10.7
	First Degree	69	61.6
	Second Degree and above	30	26.8
Employing Organization	NDRMC	19	17
	WFP	93	83
Job Position	Senior level	36	33.97
	Middle level	25	23.58
	Low level	45	42.45
Work experience (years)	<2	10	8.9
	2-5	25	22.3
	6-10	37	33
	>10	40	35.7
Duty Station	Addis Ababa	50	44.6
	Sub Offices	62	55.4
Unit	Supply Chain	97	86.6
	Others	15	13.5

Source: Research Data (2018)

With regards to gender of the respondents, as presented in above table 3, majority (69.6%) of the respondents were males. The age distribution of the respondents showed that more than 80% of the respondents were above 31 years. In terms of educational status, over 85% of the respondents hold academic qualifications of first and second degree (61.6% and 26.8% first and second degree respectively).

Referring to Table 1 above, more than 55% of respondents were senior in terms of position and middle level or supply chain professionals and the rest were technical employees. Regarding work experience of respondents, 68.7% of them had experience of more than 6 years and above which may indicate that

majority of the respondents had better understanding and had good knowledge of supply chain challenges facing humanitarian organizations in the country.

Considering the location of the respondents, 41.50% of the respondents were based in Addis Ababa and the rest were based in Regional States or branch offices and it indicates that more than 50% of the respondents were those engaged in frontlines of the humanitarian operations.

In terms of functional areas or units where the respondents were working, 86.6% were from supply chain or related areas. This indicated that a response to research questionnaire was answered with better understanding of the nature of existing supply chain challenges. In addition, there were a total of five key informants involved in the interview from both WFP and NDRMC who are highly experienced in the entire humanitarian supply chain process of both organizations. The respondents possess senior positions and level of their academic qualification is also a minimum of second degree.

4.1.4 Supply chain management challenges

Through questionnaire survey, it was possible to collect first-hand information from both employees of WFP and NDRMC regarding supply chain management challenges that WFP Ethiopia is experiencing in the course of providing humanitarian assistances to victims of both natural and made disasters in the country. The perceived magnitude of the main challenges of humanitarian supply chain management assessed through questionnaire survey that WFP Ethiopia facing were presented and discussed here. The main challenges were related to lack of coordination among humanitarian actors, lack of efficient information and communication management, inadequate or lack of transport capacity, congestions at the ports and customs clearance procedures and presence of inadequate warehouses.

The mean with standard deviation of the Likert scales are presented in series of tables for each category of the supply chain management challenges of WFP Ethiopia (Tables 4-8). Grouping of the challenges into different categories were made for which interpretations were made below.

4.1.4.1 Coordination related challenges

By its nature, there are many actors involved in coordination process of humanitarian assistance from planning stage to a point where the supplies are delivered to the targeted beneficiaries. According to results indicated in Table 4, the complexity of humanitarian organizations as a challenge for supply chain

management was rated as the highest (mean: 4.1) followed by lack of system based coordination in supply chain process (mean of 3.9) and the rest of the coordination related challenges considered in the present survey were rated quite uniformly (i.e., in terms of different items or components, there was no much variation).

The study conducted by Caroline (2015) indicated similar result that the number and diversity of actors in the relief chain is one of the major challenges attributing to supply chain management. Moreover, studies conducted in Asia supported the results of this study that lack of coordination among supply chain actors is one of supply chain management challenges. For example, there were more than 700 humanitarian organizations in 40 countries who provided humanitarian assistance during the 2004 Asian Tsunami and it was indicated that a number of factors contributed to coordination problems such as large number and variety of actors involved in responding to the crisis and lack of sufficient resources(Balcik et al. 2010).

The results of study made by Kamua (2013) also concluded that lack of coordination due to involvement of multiple players in supply chain management affects operations of humanitarian organizations and the finding is in line with the results indicated in this study. The findings of study conducted by Kovács and Spens (2009) also revealed that lack of coordination is one of the most important supply chain challenges which in line with results of this study.

Table 4: Summary of coordination related challenges of humanitarian supply chain management in the case of WFP Ethiopia

Items assessed (Likert scale: 5= strongly agree to 1=strongly disagree)	**Mean of scale**	**Standard deviation**
There is lack of coordination among supply chain actors and partners due to poor interest for collaboration	3.8	1.2
Lack of resources coordination such as transportation do not perform in full capacity	3.8	1.0
Coordinating the flow of information among humanitarian organizations is not reliable and timely	3.8	1.3
Lack of system based coordination in supply chain process	3.9	1.4
coordination among humanitarian actor is poor due to low level of their humanitarian supply chain knowledge	3.8	1.3
The nature of humanitarian assistance is very complex due to number and diversity of actors affecting the coordination process	4.1	1.0
No skills and capacity developed through SC coordination by WFP and stakeholders	3.4	1.4

Source: Research Data (2018)

4.1.4.2 Information management related challenges

The levels of challenges which can affect supply chain management related to information management were presented in Table 5. The highest disagreement (mean: 2.1) indicated by the respondents was revealed in connection with the irrelevance of information communication technology reflected in the questionnaire in the sense that information technology cannot reduce wastage and piles of stocks in supply chain management. This shows that the respondents were aware of the use and relevance of information technology in supply chain management and this is a positive indication for solving problems associated with supply chain management. The mean values of the Likert scale for the challenges related to: (1) poor information systems in terms of availability, reliability and relevance and (2) lack of completeness and transparency of information and knowledge across the supply chain management were somewhat more than neutral. This shows that availability, reliability, relevance, completeness and transparency of the use of information technology in supply chain management were only moderately perceived as a problem. This is in line with existing status of WFP Ethiopia in which the organization is utilizing effective information system (ERP) for the control and management of its operations including supply chain. In light of above, lack of up to date information system in many humanitarian organizations has an impact particularly in terms of controlling humanitarian supplies and the flows of donations from different sources (Costa et al. 2012)

Table 5: Summary of supply chain management challenges related to information management

Items assessed (Likert scale: 5= strongly agree to 1=strongly disagree)	**Mean of scale**	**Standard deviation**
Poor information systems in terms of availability, reliability and relevance	3.6	1.1
Lack of completeness and transparency of information and knowledge across the supply chain management	3.7	1.1
Application of information technology system cannot reduce wastage and piles of stock	2.1	1.1
Supply chain management function is not fully integrated in the organization corporate system or Enterprise Resources Planning (ERP)	3.0	1.2
Information sharing at all level is manual and not consistent	3.2	1.2

Source: Research Data (2018)

4.1.4.3 Transport capacity related challenges

Challenges of inadequate transportation related to supply chain management was rated as high (agreement with the existence of the different items) as mentioned in Table 6. This shows that inadequate transportation was highly rated problem for WFP to move food supplies from port to central warehouses and final distribution point. Ethiopia is land-locked country and goods intended for humanitarian assistance should be transported hundreds of miles before reaching the central stores and again to the beneficiaries. To support this statement, Chari and Nguyen (2017) pointed out that being landlocked usually create extra transportation costs and together with inadequate infrastructure can significantly limit the contribution of landlocked countries to economy. This is clearly an indication that time required to transport food commodities from the port to distribution point is long and the transport cost incurred is very high.

In relation to this, internal report of WFP Ethiopia indicated that the organization incurred over 50 million USD to cover transport only during the last three years. This finding is in line with the finding of (Kim and Singha 2010) that shortage of transport facility in the country affected timely transport of the humanitarian supplies from the port to destination. According to official document of Federal Road Transport, the number of trucks available in December 2016 to transport goods from Djibouti to Ethiopia were 10,510 with capacity of transporting 145,000 MT/month on average. However, total food commodities transported by WFP Ethiopia is higher than this figure. Hence, there exists shortage of transport facility which one of the main supply chain challenges for WFP Ethiopia.

Table 6: Transport Capacity related challenges of humanitarian supply chain management

Items assessed (Likert scale: 5= strongly agree to 1=strongly disagree)	**Mean of scale**	**Standard deviation**
Transportation modes are inadequate to transport food supplies from port to central warehouses or delivery point	4.1	1.1
Number of commercial trucks are limited to provide inland transport service from port to central warehouses for moving humanitarian supplies	4.2	1.0
Number of trucks are limited to transport food supplies from central hub or warehouses to delivery points	4.1	1.1
Transport costs are expensive due to limited number of trucks and significant volume of cargos of the country are through port Djibouti	4.1	1.1
Transportation modes are inadequate to transport food supplies from port to central warehouses or delivery point	4.3	0.9
Unavailability of communications equipment in the trucks	4.1	1.1

Source: Research Data (2018)

4.1.4.4 Port Congestion and custom clearance related challenges

In Table 7 below, survey results showed that unavailability of warehouses in adequate number with limited capacity at Djibouti port was identified as the main supply chain challenges of WFP (mean of 4.5) followed by lengthy custom clearance procedures (mean of 4.4). Port congestion in Africa is an inevitable occurrence which is mainly associated with improper planning, inadequate equipment, infrastructure constraint that could support and facilitate the transport and logistics network requirements of the ports (Gidado 2015). Capacity constraints or procedural delays emanating from improper and uncoordinated planning may cause congestion in port which in turn increase lead time and associated costs. The inadequate facility at the port creates high and complex truck congestions In this regard, Ethiopia is landlocked country and more than 90% of cargos (humanitarian and commercial) are imported through Djibouti creating port congestion and lengthening custom clearance process. WFP Ethiopia in collaboration with many partners has constructed an humanitarian logistics base in Djibouti to reduce the challenges associated with port congestions but has not been reduced to the level expected**.**

Table 7 : Port Congestion related challenges of humanitarian supply chain management

Items assessed (Likert scale: 5= strongly agree to 1=strongly disagree)	Mean of scale	Standard deviation
Port management and services are poor	4.0	0.9
Custom clearance procedures and required documentations are lengthy	4.4	0.7
Insufficient and unorganized ship berth space at Djibouti port	3.5	0.7
Untrained machine operators at the port (including dry port) and inadequate number of handling equipment	3.4	0.6
Truck congestion at the port is high and complex	4.3	0.9
Communications among stakeholders at the port is poor and coordinated	4.2	0.8
Level of expertise of stakeholders at port is minimal	3.8	0.8
Storage (warehouse) capacity at port is limited	4.5	0.8

Sources: Research Data (2018)

4.1.4.5 Warehouse related challenges

Warehouse or storage facility of supplies is a key component in any supply chain system particularly for countries like Ethiopia where both natural and man-made disasters are common. According to the finding of the survey results capacity of warehouses to contain varieties of supplies is limited and warehouses are not available in adequate number. The geographical locations of warehouses are also centralized in main cities of the country creating constraints in terms of delivery time of supplies to beneficiaries and cost involved is obviously high. To this end, majority of the respondents of study regarding constraints of warehouse agreed that there exists limitation of capacity and shortage in terms of availability in larger number.

Table 8 : Warehouse challenges affecting humanitarian supply chain management in WFP Ethiopia

Items assessed (Likert scale: 5= strongly agree to 1=strongly disagree)	Mean of scale	Standard deviation
No adequate number of warehouses in the country and near beneficiary locations	4.3	0.9
Geographical locations of warehouses are not scattered (far from port and final distribution points)	4.2	0.7
Limited capacity of warehouses in terms of space to contain variety of goods and supplies	4.4	0.8
Lack of automated system affects warehouse efficiency	4.1	1.2
Limited knowledge of materials management in warehouses increase frequency of supplies wastage, spoilage and damage	4.0	1.1

Source: Research Data (2018)

In addition to the result of the questionnaire survey, the result of the secondary data obtained from corporate financial system of the organization showed that expenditures that WFP Ethiopia incurs for warehouse rent is very high and material. Therefore, the high cost of warehouse is considered as one of the main challenges facing humanitarian organizations including WFP Ethiopia. Secondary data obtained from financial system of WFP Ethiopia revealed that the organization incurred more than 6 million USD for rental fees of warehouses during the last three years. This indicates that availability of warehouses are limited and there are no as such options for WFP except accepting the prices quoted by warehouse owners to meet the objectives of providing humanitarian assistance and requirement of proper warehousing of humanitarian supplies.

Table 9 **: Summary of number and annual total costs of warehouses**

As indicated below, 60% of warehouses are located at Nazareth central hub with nearly total annual cost of USD 1.6 million and the rest are located in different regions of the country where beneficiaries are found. In summary, WFP Ethiopia incurred an average total cost of USD 2 million in a year for warehouse rent.

Summary of active warehouse		
Location	Quantity	Annual rent (USD)
Addis Ababa	1	21,501.45
Dire Dawa	5	206,457.74
Gamella	2	18,938.60
Jimma	2	47,008.26
Kombolcha	1	50,462.57
Mekele	1	19,746.22
Nazareth	18	1,518,304.08
Grand Total	30	1,882,418.93

Source: WFP Ethiopia Financial Corporate System (2018)

4.1.4.6 Supply chain management challenges on performance

In Table 10, survey results showed that majority of the respondents agreed that inadequate warehouses in terms of capacity and number are the most supply chain challenges that impacts the operations or performance of WFP Ethiopia.. In addition, unavailability of proper and adequate transportation modes, lack of coordination, inefficient information integration have impacts on the entire operations and performance of the organization. Overall, the respondents agreed that supply chain management challenges affect the performance of WFP through high operational cost and lengthy time in delivering the humanitarian assistance to the targeted beneficiaries. Nyamu (2012) also indicated that various humanitarian supply chain management challenges affect the performance of humanitarian organizations in terms of delivering the humanitarian supplies at right cost and time. Therefore, the findings are in line with

Table 10 : Perceived impacts of various challenges on the performances of humanitarian supply chain management in WFP Ethiopia

Items assessed (Likert scale: 5= strongly agree to 1=strongly disagree)	Mean of scale	Standard deviation
Lack of coordination prevents delivery of supplies at the right cost and time	4.1	0.9
Unavailability of proper and adequate transportation modes affect delivery of the supplies in terms of time and cost	4.2	0.7
Lack of inadequate and unreliable information affects delivery of goods and services in terms of time and cost	4.2	0.8
Inefficient information system integration hinders delivery of supplies at right cost and time	4.2	0.9
Poor storage facilities create wastage of supplies	4.2	0.9
Inadequate warehouses facility and capacity increase waiting time and costs	4.3	0.9

Source: Research Data (2018)

In general , as indicated in table 11 below, survey results showed that an inadequate warehouse (mean: 4.2) in terms of capacity and number was the most supply chain challenges that WFP Ethiopia was facing. The rating of the challenge of warehouse was followed by lack of transportation facilities (mean: 4.1) and coordination related challenges (mean: 3.8). Challenges related to port congestions and customs clearance was rated 3.1 though in reality WFP Ethiopia faces supply chain challenges related to port congestions particularly during pick time when government imports and transports supplies such as fertilizers. Therefore, it should be considered as a major challenge affecting timely delivery of humanitarian supplies to beneficiaries with required cost.

Table 11 : Summary of supply chain management challenges of WFP Ethiopia

Group of challenges (Likert scale: 5= strongly agree to 1=strongly disagree)	Mean of scale	Standard deviation
Coordination related challenges	3.8	1.0
Information management	3.1	0.8
Transportation capacity	4.1	0.8
Congestion at the port and custom clearance	3.1	1.8
Inadequate Warehouse	4.2	0.7

Source: Research data (2018)

4.1.5 Correlation Analysis

Correlations are the degree of association of two or more variables. The researcher examined the associations among all variables used in the study using correlation analysis whose results are presented in table 12 below.

The researcher used Karl Pearson's coefficient of correlation (or simple correlation) analysis to examine the degree of association between each constructs (variables) and performance. Accordingly, there is positive correlation between warehouse related challenges and performance with correlation coefficient of r= 0.480 at 1% significant level (P<0.01). This indicates that warehouse related challenges and performance are positively and moderately correlated.

As revealed in table 12 below, coordination related challenges and performance are significantly correlated with a correlation coefficient of 0.455 and 1% significance level. Hence, coordination related challenges and performance are also moderately and positively correlated.

In addition, correlation between information management related challenges and performance was also positive and significant (P<0.01). hence, information management related challenges and performance were weakly and positively correlated. In terms of transport related challenges, the correlation is positive and significant at 1% level.

On other hand, the correlation between port- related challenges and performance is positive and weak and is not significant. This might be attributed to the exogenous nature of port related challenges and knowledge or understanding of the respondents about WFP and supply chain performance. In reality, port related challenges affect the operations and performance of any humanitarian organizations. According to FAO (2015) report, many countries in the world face a tough challenge because they are landlocked and lack sea access affecting the cost of supplies and time required to transport the supplies. In the context of Ethiopia, humanitarian organizations operating in the country including WFP face same challenge due to the fact that the country is landlocked and depends on port Djibouti.

In summary, the fact that the correlation between each variable and performance is moderate and weak does not mean that these factors are not supply chain management challenges of WFP Ethiopia. Despite the

correlation between each variable and performance is moderately correlated, the result of key informant interview indicated that these factors are supply chain challenges that affect supply chain performance. Moreover, internal documents also indicate that shortage of warehouse for incoming cargos, lack of logistics coordination (internal and external), lack of truck availability/capacity are the supply chain challenges of WFP Ethiopia. In addition, congestion at the port and lengthy custom clearance process are also supply chain challenges that should not be overlooked.

Table 12 **: Correlation of different supply chain management challenges**

Variables		Coordination	Information mgt	Transport	Port related	Warehouse challenges	Performance
Coordination	Pearson Correlation	1.00	.775**	.792**	0.04	.810**	.455**
	Sig. (2-tailed)		0.00	0.00	0.68	0.00	0.00
	N	112.00	112.00	112.00	112.00	112.00	112.00
Information mgt	Pearson Correlation	.775**	1.00	.554**	0.05	.615**	.350**
	Sig. (2-tailed)	0.00		0.00	0.63	0.00	0.00
	N	112.00	112.00	112.00	112.00	112.00	112.00
Transport	Pearson Correlation	.792**	.554**	1.00	0.01	.676**	.273**
	Sig. (2-tailed)	0.00	0.00		0.91	0.00	0.00
	N	112.00	112.00	112.00	112.00	112.00	112.00
Port related	Pearson Correlation	0.04	0.05	0.01	1.00	0.06	0.04
	Sig. (2-tailed)	0.68	0.63	0.91		0.54	0.68
	N	112.00	112.00	112.00	112.00	112.00	112.00
Warehouse challenges	Pearson Correlation	.810**	.615**	.676**	0.06	1.00	.480**
	Sig. (2-tailed)	0.00	0.00	0.00	0.54		0.00
	N	112.00	112.00	112.00	112.00	112.00	112.00
Performance	Pearson Correlation	.455**	.350**	.273**	0.04	.480**	1.00
	Sig. (2-tailed)	0.00	0.00	0.00	0.68	0.00	
	N	112.00	112.00	112.00	112.00	112.00	112.00

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

Source: Reseach Data (2018)

4.2 Analysis of Qualitative data (Results of key Informants)

Key informant interviews were conducted to obtain more justifications which support the results of survey questionnaire with regards to supply chain management challenges that WFP Ethiopia faces. There were five key informants who involved in the interview process from both WFP and NDRMC.

Table 13 **: Summary of key-informants**

#	Position/Title	Organization
1	Country Director, a.i	WFP
2	Supply Chain Officer	WFP
3	2 Logistics Officer	WFP
4	Logistics Team Leader	NDRMC

Source: Research Data (2018)

As indicated above, the key informants hold senior position and have strong knowledge and tangible experience in humanitarian sector for many years. Their response to the questions were summarized below.

The key informants were requested to describe the supply chain process of humanitarian organizations in the country particularly supply chain process pertinent to WFP Ethiopia. Overall, the response from each of them were almost same and the supply chain processes of WFP Ethiopia does not stand alone rather linked to national supply chain of the country and other humanitarian and development organizations. As explained by the interviewees the supply chain process includes sourcing, procurement, packaging, shipping, transportation, warehousing and distribution.

The key informants were also requested to mention and describe supply chain challenges facing humanitarian organizations in the country which is particularly relevant to WFP Ethiopia. A number of supply chain management challenges were itemized by key informants which were relevant and support the findings of the survey questionnaire. Accordingly, the most common supply chain management constraints at a country level as indicated by the informants were; poor planning and coordination among stakeholders,

poor information flow among humanitarian actors, funding constraints, improper forecasting of demand and supplies.

With specific to WFP Ethiopia, the key informants itemized following supply chain challenges that the organization faces. These include unavailability of adequate warehouses and its geographical locations, shortage and capacity of local transport, internal and external coordination process, delays of cargos at port due to port congestions, lengthy custom clearance procedures and poor planning. The informants further described that skilled human capital, inadequate infrastructure including roads and telecommunication were among supply chain challenges that hamper operations of WFP Ethiopia. The geographical location of the country, being landlocked, is also another challenge contributing to higher logistics costs and longer lead time in the process of delivery of humanitarian assistance.

The key informants stressed the importance of coordination in supply chain management process and the result of the interview indicated that coordination and management of supply chain are challenging issue due to the fact that supply network of the country is very big and complex with a number of actors. It was indicated that the Government of Ethiopia incurred a total of USD 34 million for demurrage cost only during 2016 Elino crisis in the country due to improper and poor coordination among the ministries.

The conclusions made by the key informants regarding coordination was in line with the results of a study conducted by (Jahanbani, Ghobadian, and Moradi-Joo 2012) which revealed that lack of coordination among the supply chain actors is one of the supply chain management challenges and causes increase in operational costs and delay delivery of those supplies to beneficiaries.

The informants were asked further question in relation to the effects of supply chain challenges on operations of WFP and their responses were summarized as follows. The effects include reduce performance of the entire supply chain system that hamper effectiveness of the organization, increase logistics cost of the organization such as warehouse and transport costs. This result was similar to that of questionnaire survey and secondary data. Another effect of supply chain challenges was increase of the lead time and costs of delivering humanitarian supplies.

The informants further itemized the existing coping strategies of the challenges which include use of preposition of supplies, investing in alternative corridors like Berbera to avoid port congestion in Djibouti. Moreover, better planning to forecast demands properly, use of qualified personnel and develop the

capacity of human capital, adoption of technology/ innovation is also coping strategies mentioned by the key informants. WFP Ethiopia started implementation of comprehensive warehouse improvement project which contributed in minimizing shortage of warehouses.

CHAPTER FIVE

5 Summary, Conclusion and recommendations

This chapter presented summary and conclusion of the study followed by proposed recommendations by the researcher.

5.1 Summary of Major Findings

According to results of the descriptive statistics obtained through survey questionnaire and key informant interview, supply chain management challenges hamper operations and effectiveness of humanitarian organizations including WFP. In this regard, the occurrence of supply chain management challenges in the humanitarian sector hinder supply chain efficiency in providing humanitarian assistances and it also limits achieving the goals. In this study, supply chain challenges were categorized as lack of coordination related challenges, information communications management challenges, transport capacity related challenges, port congestions and lengthy custom clearance procedures and inadequate warehouse or storage facility challenges. Consequently, the most supply chain challenges that WFP faces were inadequate warehouses both in number and capacity followed by challenges related shortage and capacity of transport in moving the humanitarian supplies in the country. Based on finding of the research work, coordination related challenges was also one of the major challenges.

The finding also revealed that WFP Ethiopia experiences coordination related challenges since the number of actors involved in humanitarian sector are very large with various background and experts. In addition, congestions at the port and lengthy custom clearance process are another challenges and this was due to geographical location of the country, landlocked country.

5.2 Conclusions

This study shed light the supply chain management challenges that WFP Ethiopia faces in the process of providing humanitarian food assistance and delivering to beneficiaries.

Based on the results of the study produced through questionnaire survey, key informant interview and secondary data, the study identified and described various supply chain challenges pertinent to WFP Ethiopia. In the first place, unavailability of warehouses or storage facilities in large number and with enough capacity were the major supply chain challenges that the organization was facing. The inadequate number of warehouses in the country has resulted in incurring material amount of expenditures for warehouse rents. In relation to this, total expense incurred by WFP Ethiopia for warehouse rent only during the last three years was approximately USD 6 million. According to key informants, the geographical locations of warehouses that WFP rents are concentrated in few place usually main cities of regional states resulting in ineffectiveness and efficiency in distribution of food supplies to beneficiaries.

Second, shortage of transportation facilities was also another major supply chain challenges affecting supply chain management and performance of WFP Ethiopia. The number of trucks are inadequate to transport humanitarian food assistance from port Djibouti to the country and according to interview result of one of the key informants, there are also restrictions on transport companies by government particularly during pick season to transport other government prioritized commodities which resulted in serious shortage of trucks.

In addition, lack of coordination was identified as a major supply chain challenges that WFP Ethiopia experienced and this was due to the fact that the number of humanitarian actors are many making coordination process ineffective and inefficient in terms of delaying the process and demanding high cost. According to internal report, WFP Ethiopia incurred significant amount of demurrage costs at Djibouti port due to lack of coordination among the supply chain actors and the host government. This was witnessed through interview with one of the key informants.

The results of key informants further showed that there exist many other supply chain challenges; skilled Human capital, inadequate infrastructure including roads and telecommunication, geographical location of the country (being landlocked) were some of challenges.

In general, supply chain management challenges contributed to inefficiency and ineffectiveness of the entire supply chain process in delivery of the humanitarian supplies by increasing operational costs and lead time which ultimately reduce performance of the organization. In line with, the result of the study proposed a number of coping strategies which include use of prepositioning of supplies, seek for alternative corridor, use of technology and innovation in supply chain management .

5.3 Recommendations

Supply chain management is managing supply chain networks from origin to destination for the purpose of increasing efficiency (cost reduction) and better delivery of services (reduce lead time). In this process, however, there are a number of challenges that organizations may face with regards to supply chain management which are also pertinent to WFP Ethiopia.

To this effect, the results of the study revealed that there are many supply chain management challenges that WFP Ethiopia faces in the course of providing humanitarian assistances to the victims of any disasters in the country. The researcher has made following recommendations based on the findings of the study.

In order to mitigate the challenges pertinent to shortage of warehouses, use of mobile storage units (MSU) for remote areas where leasing or building of permanent warehouse is difficult. WFP should also work with host government on storage expansion and capacity building.

With regards to transport related challenges, WFP Ethiopia should contribute to capacity building of transport sector in the country through formal training and experience sharing. In particular, WFP Ethiopia needs to contribute to the existing transport capacity building project initiative being undertaken by government of Ethiopia. WFP Ethiopia should also explore the possibility of shifting the transport mode to railway so that there will be much reduction in cost and time. Another alternative is to use regional sourcing of transport facilities from neighboring countries though the option may not contribute to national economy.

In connection to coordination issues, the management of WFP Ethiopia in collaboration with supply chain actors may develop supply chain platform that enhances the coordination process among stakeholders in the country. It is also recommended that humanitarian and commercial supply chain forum should be created to allow supply chain actors in the country have access and opportunity to discuss issues related to supply chain challenges which in turn enhances and improves the coordination process.

In order to manage constraints related to port congestion, WFP Ethiopia may seek to shift to alternative corridors, Berbera, which the government of Ethiopia is also in the process of negotiating with the government of Somali to use the corridor. Moreover, adopting preposition of humanitarian supplies in strategic locations may avoid challenges related to congestions in the port and lengthy custom clearance

process. This will ultimately enhance supply chain efficiency and allow WFP Ethiopia to provide humanitarian assistance timely.

Finally, research works focusing on humanitarian supply chain management have not been widely researched and WFP Ethiopia needs to explore conducting of research on different relief areas which may create opportunities for other humanitarian organizations to use as a reference document.

5.4 Future Research Direction

The present study assessed supply chain management challenges of WFP Ethiopia and the impact of the challenges on operations of the organization. Therefore, the researcher recommends that studies focusing on following topics be done;

- The Impact of effective humanitarian supply chain management on sustainable Development of a country
- Impacts of Implementing Corporate System in Supply Chain Management in Humanitarian Sector
- This study can also be repeated after few years to find out if the current findings will still remain the same or there will be changes.

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Annex I: Questionnaire to be filled by Supply Chain Specialists and Practitioners of World Food Programme and National Disaster Risk Management Commission

Addis Ababa University-College of Business and Economics

Questionnaire on Assessment of Humanitarian Supply Chain Management challenges on Performance, the case of World Food Programme- Ethiopia

This questionnaire is designed to collect primary data for the study entitled "Assessment of Humanitarian Supply Chain Management Challenges on Performance- The case of World Food Programme-Ethiopia'' in partial fulfilment of Masters of Business Administrations set forth by Addis Ababa University.

I kindly request you to spare some times and to honestly respond to all the questions. The information obtained from this questionnaire will be kept confidential and will not be used for any other purposes.
Thank you in advance for your cooperation and if you have any question, clarification or comment related to the questionnaire, please feel free to contact me @ 0911 487407 or via e-mail: amenu.dessalegn@wfp.org or amenud@gmail.com

Thank you for your cooperation

Dessalegn Amenu

Phone: 0911487407

March 2018

Addis Ababa-Ethiopia

Instructions to fill the questionnaire:

- **You do not need to write your name**
- **Please use a "√" mark to select the options that best represent your response for part I, II and III.**
- **For any additional explanation, you are kindly requested to write briefly on the space provided next to the questions that demand you to put your written feedback.**

PART –I: General Information

This part of the questionnaire is designed to gather or obtain basic and general information about the background of the respondent and the organization.

1. **Gender**

   Female ☐ Male ☐

2. **Age**

   Under 20 Years ☐ 31-40 Years ☐

   20-30 Years ☐ Over 40 Years ☐

3. **Academic Qualification**

Grade 10 completed ☐ First Degree ☐

Grade 12 completed ☐ Second Degree and above ☐

College Diploma ☐

4. **Name of the organization and unit**_____

5. **Current Position/Title**_____

6. **Length of service year**_____

   Under 2 Years ☐ 6-10 Years ☐

   2-5 Years ☐ Over 10 Years

7. **Duty Station**_____

8. Functional Unit/Section_____

Procurement	☐	Programme	☐
Supply Chain	☐	Budget and Programming	☐
Warehouse	☐	Finance	☐
Transport	☐		

PART -II: Humanitarian supply chain management challenges and their effect on performance

This part of the questionnaire is related to humanitarian supply chain management challenges on performance in humanitarian organization, the case of World Food programme- Ethiopia Country Office.

Section I- Humanitarian Supply Chain Management Challenges (Coordination, Information &Communication, inadequate local transport capacity, port congestion & custom clearance and warehousing facility)

State the extent to which you agree with the following statements concerning the extent to which WFP as an organization faces the following challenges.

Use the Likert scale of

1- Strongly Disagree	2- Disagree	3- Neutral	4- Agree	5- Strongly Agree

#	Challenges of Humanitarian Supply chain management					
1	**Coordination related challenges**	**1**	**2**	**3**	**4**	**5**
1.1	Lack of coordination among supply chain actors and partners due to poor interest (AA1)					
1.2	Lack of resources coordination such as transportation do not perform in full capacity (AA2)					
1.3	Coordinating the flow of information among humanitarian organizations is not reliable and timely (AA3)					
1.4	Lack of system based coordination in SC process (AA4)					
1.5	coordination among humanitarian actor is poor due to low level of their humanitarian supply chain knowledge (AA5)					
1.6	The nature of humanitarian assistance is very complex due to number and diversity of actors affecting the coordination process (AA6)					
1.7	No skills and capacity developed through SC coordination by WFP and stakeholders (AA7)					
2	**Information management and communications challenges**	**1**	**2**	**2**	**4**	**5**
2.1	Poor information systems in terms of availability, reliability and relevance (BB1)					
2.2	lack of completeness and transparency of information and knowledge across the supply chain management (BB2)					
2.3	Application of information technology system cannot reduce wastage and piles of stock (BB3)					
2.4	Supply chain management function is not fully integrated in the organization corporate system or Enterprise Resources					

	Planning (ERP) (BB4)					
2.5	Information sharing at all level is manual and not consistent (BB5)					
3	**Transport related challenges**	**1**	**2**	**3**	**4**	**5**
3.1	Transportation modes are inadequate to transport food supplies from port to central warehouses or delivery point (CC1)					
3.2	Number of commercial trucks are limited to provide inland transport service from port to central warehouses for moving humanitarian supplies (CC2)					
3.3	Number of trucks are limited to transport food supplies from central hub or warehouses to delivery points (CC3)					
3.4	Transport costs are expensive due to limited number of trucks and significant volume of cargos of the country are through port Djibouti (CC4)					
3.5	Unavailability of communications equipment in the trucks (CC5)					
4	**Congestion at Djibouti Port related challenges:**	**1**	**2**	**3**	**4**	**5**
4.1	Port management and services are poor (DD1)					
4.2	Custom clearance procedures and required documentations are lengthy (DD2)					
4.3	Insufficient and unorganized ship berth space at Djibouti port (DD3)					
4.4	Untrained machine operators at the port (including dry port) and inadequate number of handling equipment (DD4)					
4.5	Truck congestion at the port is high and complex (DD5)					
4.6	Communications among stakeholders at the port is poor and coordinated (DD6)					
4.7	Level of expertise of stakeholders at port is minimal (DD7)					
4.8	Storage (warehouse) capacity at port is limited (DD8)					
5	**Warehousing challenges**	**1**	**2**	**3**	**4**	**5**
5.1	No adequate number of warehouses in the country and near					

	beneficiary locations (EE1)					
5.2	Geographical locations of warehouses are scattered (far from port and final distribution points) (EE2)					
5.3	Limited capacity of warehouses in terms of space to contain variety of goods and supplies (EE3)					
5.4	Lack of automated system affects warehouse efficiency (EE4)					
5.5	Limited knowledge of materials management in warehouses increase frequency of supplies wastage, spoilage and damage (EE5)					

Section-II Performance

State the extent to which you agree with the following statements concerning the extent to which humanitarian supply chain management challenges (coordination, information & communication, local transport capacity, port congestion &custom clearance and warehousing facility) affect performance in terms of responsiveness/lead time and cost.

Use the Likert scale of;

1- Strongly Disagree	**2- Disagree**	**3- Neutral**	**4- Agree**	**5- Strongly Agree**

	Humanitarian Supply chain performance	**1**	**2**	**3**	**4**	**5**
1	Lack of coordination prevents delivery of supplies at the right cost and time (PP1)					
2	Unavailability of proper and adequate transportation modes affect delivery of the supplies in terms of time and cost (PP2)					
3	Lack of inadequate and unreliable information affects delivery of goods and services in terms of time and cost (PP3)					
4	Inefficient information system integration hinders delivery of supplies at right cost and time (PP4)					
5	Poor storage facilities create wastage of supplies (PP5)					
6	Inadequate warehouses facility and capacity increase waiting time and costs (PP6)					

Heartfelt thanks! I appreciate your time in in completing the questionnaire and Please continue supporting humanity.

====END====

Addis Ababa University-College of Business and Economics

Annex II- Semi-structured interview questions for Key informants

Greetings

I am conducting a research on Assessment of Supply Chain Management Challenges of Humanitarian Organizations- The case of WFP Ethiopia for a partial fulfillment of my Master Degree program in Business Administrations at Addis Ababa University. The purpose of this research is to assess the existing humanitarian supply chain challenges in the course of providing humanitarian assistance.

In this regard, I would like to request you to participate in this research because I believe that your experience in the humanitarian response in Ethiopia can contribute much to understand the sector. Please answer the question freely. **All the information will be treated confidential and will never be shared with any party without your prior consent.**

The interview will take about 30 minutes to complete. Your genuine and honest responses are essential to draw and build accurate pictures of the issues that are important for the research.

A. Tell me how your supply chain works. What are the processes?
B. What are the challenges of supply chain management in your organization?
C. Tell me the effects of supply chain challenges on operations of humanitarian organizations in Ethiopia. Example WFP?
D. How does your organization address the existing supply chain challenges?
E. Ethiopia is landlocked country. What does this mean on supply chain of humanitarian organizations in the country?

Thank you

Dessalegn