ASSESSMENT OF HUMANITARIAN LOGISTICS PRACTICE AND ITS EFFECT ON PERFORMANCE: THE CASE OF ETHIOPIAN RED CROSS SOCIETY

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Assessment of Humanitarian Logistics Practices and Its Effect on Performance: The Case of Ethiopian Red Cross Society

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DECLARATION

I, the undersigned, declare that this thesis entitled, “Assessment of Humanitarian Logistics Practices and Its Effect on Performance: The Case of Ethiopian Red Cross Society” is my original work and that I have not previously in its entirety or in part submitted at any university for a degree and all the sources of materials used for the thesis have been duly acknowledged.

Signature: _____

DEDICATION

This Research work is heartily and proudly dedicated to the organizations and people who have served as a humanitarian to save life and mitigate human suffering in difficult situation.

CERRTIFICATION

I, the undersigned certify that I have perused and therefore recommend for acknowledgment by the Addis Ababa University, School of Commerce a thesis entitled: “Assessment of Humanitarian Logistics Practices and Its Effect on Performance: The Case of Ethiopian Red Cross Society” in partial fulfillment of the requirements for the Degree of Masters in Logistics and Supply Chain Management.

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Zelalem Bayisa, Ph.D.

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ABBREVIATIONS AND ACRONYMS

ERCS: Ethiopia Red Cross society

HL: Humanitarian Logistics

HO: Humanitarian Organization

HP: Humanitarian Practice

IFRC: International Federation of Red Cross and Red Crescent

IRCS: International Red Cross Society

NGO: Non-Government Organization

OCHA: United Nations Office for the coordination of humanitarian office

SCM: Supply chain management

UN: United Nation

USD: United States Dollar

USAID: United States Agency for international development

WBG: world Bank Group

WFP: World food program

WHO: World health organization

ABSTRACT

Owing to several factors, the number of natural and man-made disasters has increased alarmingly and accordingly also the need for humanitarian logistics. Thus, humanitarian logistics is very critical to efficiently and effectively provide emergency relief to those people in need. The aim of this study is to assess humanitarian logistics practice and its effect on performance in the case of Ethiopian Red Cross Society /ERCS/. The study used descriptive and explanatory research design along with mixed method approach to the research. Due to the small size of the target population census survey were applied to collect data from 80 respondents. The humanitarian logistics practices of the organization were assessed using the five basic logistics practices; situation analysis, procurement, transportation, warehouse and distribution management practices. Humanitarian logistic performance also assessed using reliability, cost and responsiveness. Besides, both internal and external challenges faced by the organization during its humanitarian operations were identified through semi-structured interview. The findings of the study indicate that situation assessment is well practiced, while the rest procurement, transportation, warehouse, and distribution management are practiced to moderate level. Challenges related to information communications, fund, coordination & collaboration, stock-out, price inflation, inefficiency of venders, deterioration of the relief item, poor infrastructure, poor safety & security and customs delays were identified. The inferential result revealed that, there is weak and positive relationship between the dependent and independent variables and the regression equation obtained is able to explain 37.3% of humanitarian supply chain performance. Finally, recommendations were forwarded.

Keywords: Humanitarian Logistics, Practice, Performance, Reliability, Cost, Responsiveness

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Disasters can be defined as sudden, calamitous events that disrupt the activities of a society or a community and cause human, material, economic, or environmental losses that exceed the recovery capacity of the affected community or society using only its resources. Disaster is a kind of distraction actually affects the whole system in a community (Van Wassenhove, 2006).

Disaster poses a significant risk to the life, economic and social development of path of a community by exposing population and productive assets to multiple hazards. According to the statistics data from The United Nations Office for Disaster Risk Reduction (UNISDR), between 2000 and 2012, 1.2 million people were killed and 2.9 billion were affected by different kinds of disasters. The estimated economic impact of the damages totaled approximately US$ 1.7 trillion in the same period. Forecasts estimate that over the next 50 years, natural and man-made disasters will increase by five times in number and severity (Thomas and Kopczak, 2005). In 2011, worldwide economic devastations caused by natural disasters were estimated at US$ 366.1 billion whereas 30,773 people were killed and around 244.7 million people were directly affected (Guha, Sapir et al., 2012). These data is a clear indication for negative effects of the natural disaster on human life and economy as well.

However, a countries level of development and environmental quality has its own contribution for human vulnerability to disasters (Pamela et.al, 2011). Disasters pose a significant risk to the economy and social development path of the developing countries. Obviously, those poor and socially deprived parts of a society in developing countries are the predominant victims of the disaster. Since they do not have enough capacity to adapt or recover from potential consequence of disaster, relief aid is particularly important (‘Kumala, 2020).

According to Kovacs and Spens (2007), as the number of natural disaster alarmingly increase from time to time, it impose pressure on humanitarian relief actors that affect effective the delivery of humanitarian aid action. Understanding the vulnerability of people and their livelihood to the effect of disaster is fundamental to manage and take immediate response at the

right time when emergency is needed; hence the role of humanitarian logistics is critical issue in the humanitarian aid process. As humanitarian logistics contributes about 80% of the disaster relief effort, humanitarian logistic operation should be managed appropriately and more professionally to maximize its efficiency and effectiveness (‘Kumala, 2020).

Bolsche (2013) defines humanitarian logistics as the process of organizing and managing the movement of goods and information from its area of origin to the area of conception for the purpose of alleviating human suffering and material damage in disaster. The function includes activities like; organizing, preparedness, procuring, custom clearing, transporting, warehousing, and delivering of the supplies during disaster to the affected people and area (Thomas & Kopczak, 2006). This activity also requires effective cooperation and coordination among stakeholders and other humanitarian actors.

Recently scholars have considered the issues of humanitarian logistics from different perspectives, including public policy, urban planning, civil engineering, and particularly operations and supply chain management. For example, since 2011 variety of academic articles has been published on journals of Humanitarian Logistics and Supply Chain Management. On the flip side, the area of humanitarian relief action in disaster yet not received full attention; hence application of supply chain management is critical and required in humanitarian operations and disaster relief (Galindo and Batta, 2013).

As results of interrelated and complex driving factors, Ethiopia has currently faced immediate emergency responses. Conflicts, drought, displacement, political instability, high cost of living, high inflation, currency devaluation as well as the impact of Covid-19 are the main driving factors for humanitarian need in Ethiopia (EDRMC, 2020). Forecasts indicate that people in horn Africa will continue to suffer from lack of sufficient rain fall, high inflation and other risks which affect their livelihood and life unless and other ways some privative measures are taken (EDRMC, 2020).

The nature of humanitarian crisis in Ethiopia suggests the need for concerted disaster risk reduction and disaster mitigation. Despite this fact, the USID/BSH report (2022) indicated that there is inadequate logistics capacity that hampers the disaster response in Ethiopia. This

problem is due to different internal /organizational/ and external /stockholders/ factors that may hinder the performance of humanitarian logistics. Manmade and natural disasters happening in Ethiopia within the last few years have seriously affected the humanitarian operation. This would be because of different factors in NGOs and other stakeholders outside the organization. Hence this study has intended to study humanitarian logistics practice and the effect it has on humanitarian logistics performance in Ethiopian Red Cross Society.

1.2 Background of the Organization

The Red Cross and Red Crescent Movement is the largest volunteer based humanitarian organization in the world which was established by Henry Dunant in 1863. On 8 July 1935, the government of Ethiopian established Ethiopian Red Cross Society (ERCS) and starts its work by treating and supporting wounded soldiers and non-military sufferers. In same year, 25 September 1935, ERCS was formally recognized as the 48th member of the International Federation of Red Cross and Red Crescent Societies (ERCS's Annual Magazine, 2019).

Currently, Ethiopian Red Cross Society (ERCS) is work based on its strategic plan announced for the period of 2020-2025. This strategic plan contain 5 main programs namely: disaster preparedness and response and disaster risk reeducation, promotion of culture and non-violence and peace, membership and volunteers' engagement, impose building and humanitarian diplomacy, and capacity building and resource mobilization (ERCS' Annual Report, 2022). ERCS also works in partnership with the Ethiopian Government, International Federation of the Red Cross and Red Crescent (IFRC), International Committee of the Red Cross (ICRC), partnering National Societies, members, volunteers and the communities we serve.

ERCS was established and recognized as a humanitarian organization through a National Charter adopted on October 31, 1947. The Charter has been revised at different time, the last being in 1999. Currently on action Charter was declared in January 2018, by the Parliament. ERCS has established different long-term partnerships with partners and stakeholders from different upbringings, including public bodies, other national societies, associations, including businesses, private initiatives and individual volunteers. 'Relief Distributions for the people affected by manmade and natural disasters' is one of the oldest and fames service of this organization. Since

that the department was established to provide humanitarian service by mobilizing resources from external sources.

Ethiopian Red Cross Society's purpose is to protect life and health and to ensure respect for the human being. It promotes mutual understanding, friendship, cooperation and lasting peace amongst all peoples. The organization works based on 7 principles, namely: Humanity, Impartiality, Independence, Neutrality, Unity, Universality and Voluntary Service. Currently the ERCS has a structure consisting of 12 Regional Offices, 33 Zonal Branches and 131 District/Woreda Branches, 599 Woreda Red Cross Committee and 5871 Kebele Red Cross Committees.

1.3 Statement of the Problem

Ethiopia is the second most populous country in Africa, with a population of over 109.2 million people, and its annual population growth rate is 2.5%. It is one of the most vulnerable countries to climate variability and climate change due to its high dependence on rain-fed agriculture and natural resources, and relatively low adaptive capacity to deal with these expected changes (World Bank Group, 2020). Challenges include the under-development of water resources, low health service coverage, a high population growth rate, low economic development, inadequate road infrastructure in drought-prone areas, weak institutional structures, and lack of awareness (World Bank Group, 2020).

Populations in Ethiopia frequently struggle with conflicts, drought, flooding, food insecurity, limited access to clean water and health, displacement, disease outbreaks high cost of living, high inflation, and currency devaluation (NDRMC, 2018). The intensity and frequency of these challenge adversely affected the life and livelihoods of people causing sustained humanitarian needs and an ongoing complex emergency (NDRMC, 2018).

According to USAID(2020), there are a compounded effects of conflict, climatic shocks, and related displacement continue to cause high levels of humanitarian need across Ethiopia, with more than 20 million people requiring relief aid. Due to a historic drought and the conflict in northern Ethiopia, there is high demand for humanitarian aid in the country. There are other

challenges that the country has faced like; disease outbreaks, high food prices, inter-communal conflict, and seasonal flooding (USAID, 2020).

According to the UN Report (2021), in the Horn of Africa, particularly in Ethiopia drought has affected 24.1 million people, while approximately 345,000 people were displaced and 8.3 million people were faced daily household water insecurity. Furthermore, the UN estimated that people who required immediate food assistance could be 9.9 million, whereas above 2.2 million children were suffered from serious lack of malnutrition as a result of the drought. The death of approximately 3.5 million livestock, devastating livelihoods for pastoralists and reducing access to milk, and shortage of source of nutrition for pastoral households were also the result of the drought. Because of the conflict in northern Ethiopia, humanitarian actors faced challenge in reaching out the humanitarian assistance to affected people in Tigray, Amhara and Afar regions, according to the UN (2021).

Similarly, inter-communal conflict and armed group movement in in different part of eastern, southern, and western Ethiopia had a devastating effect in rising up the number of displeased people and hindering access to humanitarian need. The conflict-affected Benishangul Gumuz Region also resulted in widespread displacement which hindered the humanitarian effort. Meanwhile, insecurity in some drought-affected areas of Oromia and Somali regions affected the drought response efforts and limited access to assistance and livelihood opportunities (USAID, 2020).

Humanitarian relief activates can face several challenges due to different factors like; unpredictability of demand and supply, dalliance in delivering aids, poor infrastructure, uncertainty of the acquisition of necessary supplies, and information and communication problems among stakeholders (Gursoy et al., 2010).

Personal experience of the researcher and the reviewed literature indicates that the conditions in which humanitarian actors work is very complex and full of the challenges they face. Poor infrastructure, uncertainties, earnestness, insecurity of humanitarian workers, bureaucratic way of doing things, lack of motivation, insufficient transportation and warehouse management, weak information communication, lack of funds and poor coordination and collaboration among

stakeholders are the major problems that humanitarian actors have faced in implementing humanitarian logistics. All these challenges of humanitarian operation might have influenced the practice of humanitarian logistics which might have also adversely affected the humanitarian logistics performance.

The inadequate research in the field of humanitarian logistics in Ethiopia, the socio-economic impact of the disasters exhibited in the country compiled with the internal and external challenges that the humanitarian organizations currently have faced were motivate the researcher to study humanitarian logistics practices and its effect on performance the case of Ethiopian Red Cross Society.

1.4 The Objective of the Study

1.4.1 The General Objective

The general objective of the study was to assess humanitarian logistics practice and its effect on performance in the case of Ethiopian Red Cross Society /ERCS/.

1.4.2 Specific Objectives

The following were specific objectives of the study:

1. To assess the current humanitarian logistics practice of the ERCS.
2. To identify the main internal and external challenges that affect humanitarian logistics performance of ERCS.
3. To determine the effect of humanitarian logistics practices on logistics performance of ERCS.

1.5 Research Questions

The research was pursued by the following research questions to seek answer for each specific objective mentioned above.

1. What do the current practices of humanitarian logistics in the Ethiopian Red Cross Society look like?
2. What are the main internal and external challenges that the Ethiopian Red Cross Society faced?

3. To what extent do situational assessment, procurement, warehouse, transport, and distribution management practices affect the logistics performance of ERCS?

1.6 Significance of the Study

Humanitarian logistics yet not seriously considered and there is lack of research in this particular issue as many researches focus on commercial logistics, hence this study can contribute much more in providing insights for improvement of humanitarian logistics practices. Particularly, this finding can help both humanitarian actors and other stakeholders to understand the existing practice and realize the challenges and gaps in humanitarian logistics performance and its potential impact in the emergency responses process.

The contribution of this study will be high in providing clear understanding about the complex features of humanitarian logistics and the extent to which its performance has been realized. Based on the finding of this study, the humanitarian organizations and other concerned bodies can therefore use the result of this finding to formulate their own policy action so as to tackle the problem.

Most existing studies have focused on the commercial base of logistics, which have left a glaring gap on the role of humanitarian logistics, particularly the case of humanitarian organizations (HOs) have not yet adequately studied. Thus, this study will also contribute a lot to address this gap and create awareness to all concerned organizations and stakeholders with the intention of understanding the characteristics of humanitarian logistics as it has a potential to save human life. Furthermore, the study may inspire other interested researchers to conduct more extensive studies in humanitarian logistics areas in future.

1.7 Scope of the Study

Because of the resource limitation, this research focused on practice of Humanitarian Logistics and its potential effect on humanitarian logistics performance in case of Ethiopian Read Cross Society /ERCS/, Headquarter, which have been engaged in emergency relief assistance programs in Ethiopia. Pertaining to perspective, this study traced some common Logistics Practices (Situation Assessment, Procurement Management, Transportation Management, Warehouse Management and Distribution Management), Challenges (Internal and External), and

Performance (Reliability, Responsiveness and Cost,) variables from literatures and endeavors to assess humanitarian logistics practice and its effect on performance in case of Ethiopian Red Cross Society /ERCS/. The participants were the specialists from headquarter of ERCS, who had working experience in disaster rescue and humanitarian relief logistics areas.

1.8 Limitations of the Study

This research has 3 main limitations. First; key restraint of this study was the difficulty to easily access the participant of this study due to the nature of their profession; as they were very busy to found them. Second; as the research population is limited to the population at headquarter because of time and budget, this finding of this research may not fully represent the entire population of ERCS in different branch throughout the country. The third and the final might be related to the scope of the study as it has only focused on one Humanitarian Organization (ERCS). Thus, the scope of this study might not be wide enough to represent all of the humanitarian organizations.

1.9 Definition of Terms

Disaster: is serious disruption to the functioning of a community that goes beyond its capacity to cope using only its own resources (WHO, 2002).

Humanitarian Aid is logistical assistance to people who affected by disaster, in response to humanitarian relief action (Kleindorfer and Van Wassenhove, 2004).

Humanitarian Logistics: is the process of organizing and managing the movement of goods and information from its area of origin to the area of conception for the purpose of alleviating human suffering and material damage in disaster (Bolsche, 2013)

Humanitarians Organizations (HOs): is a not-for-profit body dedicated to provide aid to the emergency areas where people are affected by different disaster.

Performance: it is the capability of the logistics to satisfy the need of end users by implementing effective planning and management of all logistics activities, across humanitarian organizations (Willner and Zafeiridis 2010).

Reliability: refers to ability of HO to deliver the relief supplies at the right time with right quality and quantity (Lu et al., 2016).

Responsiveness is shows immediate response time of humanitarian supply chain management to any emergencies (Beamon & Balcik, 2008).

Cost is shows hoe how the humanitarian logistics performed in cost wise ways (Lu et al., 2016).

1.10 Organization of the Study

Generally, the paper is encompasses five chapters. Chapter one discusses the background of the study, background of organization, problem statement, objective of the study, research question, significance of the study, the scope of the study, limitation of the study, definition of terms and finally organization of the study. Chapter two concerns with the review of related literature contains of theoretical literatures, empirical literature and conceptual framework of the study. Chapter three present the research methodology that includes description of the study area, research approach, research design, population sample, data source and type, data collection procedures, data analysis, ethical consideration and validity and reliability of the study. Chapter four covers research results and discussions which includes; demographic data, descriptive analysis, inferential analysis and discussion of results. Chapter five summarizes the finding of the study, and forward possible recommendations as well as suggestions for future study.

CHAPTER TWO

2. REVIEW OF RELATED LITERATURE

Introduction

This chapter of the study introduces and disuse the theoretical and empirical works of related literatures on humanitarian logistics practices, challenge and performance along with the conceptual framework of the study written by different authors.

2.1. Theoretical Literature Review

2.1.1 A Brief History of Logistics

Logistics is a crucial part of any successful business. Today, logistics wide excessed in many commercial, non-commercial, government, military, and other types of trades. Progressively, the issues of warehouse, transportation, distribution, and inventory have become as important as any other aspect of business operations. However, managing these logistics operations didn't become what it is dramatic.

The linguistic roots of the word "logistics" come from the French term *"Logis"* which means the accommodation of the troops. The Greeks had a term called *"Rhocrematics"* that discussed material flow. Early in the 19th century, logistics was introduced and defined by the military as the planning and movement of troops (Bartodziej, 2017)

The history of logistics started centuries ago when different supplies delivered to military affairs and population. The following is the summary of a history of logistics as Victor Harper (Appril27, 2021) posted on a website of *universalcargo.com*, */https://www.universalcargo.com/a-brief-history-of-logistics/*:

> *"Probably the first application of logistics (*logistics in the ancient times*) was for military purposes. Like China and Egypt, various ancient civilizations needed an efficient way to expand their influence through trading and warfare. One of the first signs of modern logistics that rely on systematic distribution can be seen in ancient Greeks and Romans. Alexander the Great used logistics to provide support for his impressive and long*

campaigns. Many other kingdoms, including Persian invaders, used planned logistics to move large troops across the land. By the end of the Middle Ages, military logistics more upgraded; movements of material and people and storage were introduced. Mechanisms were developed to transport goods and animals. As a result of industrialization railroads and ships started as means of transportation through the development of steam engines. Gradual advancement in technological, transportation and communication during the 19th century paved way to development and use of logistic to daily-routine life. Technological advance in area of computer sciences has also transformed logistics management practice through better planning, managing, and enhancing every aspect of logistics, irrespective to the scale of businesses"

The initial history of logistics explains, logistics was a military activity concerned with getting men and munitions to the battlefront in time for the fight. It was seen as important but not vital for military prowess. But it is now appreciated as being an integral part of the modern production process. While only a few years ago it was virtually unheard of for companies to have logistics experts on boards of large manufacturing companies, this has now changed considerably (Christopher, 2011).

Generally, logistic and supply chain management has grown in many aspects in many organizations. Formerly, distribution management was seen as the only concern with transportation and warehouse management. Intrinsically, the efforts of logistic managers have increased to be on cost minimization and the optimization of the systems and resource (Christopher, 2011).

2.1.2 Definition and Concepts of Logistics

Logistics is the function responsible for these movements both tangible (such as raw materials, components, finished goods, and spare parts) and intangible (predominantly information); it manages the stock, movement and distribution of goods on their passage from original suppliers through supply chains and on to end user. In fact, many people use the terms 'logistics' instead of 'supply chain management' and vice versa, hence Institute of Logistics and Transport gives the following definitions.

> ***Logistics*** *is the time related positioning of resources or, the strategic management of the total supply-chain.*
>
> *The* ***supply-chain*** *is a sequence of events intended to satisfy a customer. It can include procurement, manufacture, distribution and waste disposal, together with associated transport, storage and information technology.*
>
> [Institute of Logistics, 1998]

Different authors also defined the term logistics differently. For instance, Alan and Steve defined logistics;

> "*Logistics can be defined as the process of planning, implementing and managing the movement and storage of raw materials, work-in-progress inventory, finished goods and the associated information from the point of origin to the point of consumption" (Alan and Steve, 2007:5).*

The followings are also definitions given to logistics by different authors;

> *"Logistics is defined as the planning, organization, and control of all activities in the material flow, from raw material until final consumption and reverse flows of the manufactured product, with the aim of satisfying the customer's and other interest party's needs and wishes i.e., to provide a good customer service, low cost, low tied-up capital and small environmental consequences" (Jonsson & Mattsson, 2005).*
>
> *"Logistics is defined as those activities that relate to receiving the right product or service in the right quantity, in the right quality, in the right place, at the right time, delivering to the right customer, and doing this at the right cost (The seven R's)" (Shapiro, Heskett,1985).*

Generally, logistics denotes effective planning and transporting and controlling of goods from one area to another. Logistic aimed at moving and delivering of supplies by different means through the entire supply chain. Logistic activates include storage, transportation, inventory management, warehousing, and distribution management.

2.1.3 Concepts Related to Humanitarian Logistics

Humanitarian logistics is refers to proper management of emergency aids from its donors to the donees (Chandes & Pache, 2010). It is the activity of moving goods, services and information to disastrous area to help the affected community (Bhimani & Song, 2016). Aside profit, humanitarian actors always look for balance between speed and cost in their supply chain system while emergency responses action takes high attention for fast and immediate response to save life and mitigate devastation.

Humanitarian organizations assesses the situation of the disaster happened, prioritize the need of the affected people, analyze the quantity needed and tack quick measures to solve the problem (Tomasini & Wassenhove, 2009). Humanitarian logistics mainly focus on mobilizing manpower, resource, knowledge and skills to alleviate human suffering because of disaster (Wassenhove, 2006). As disasters result in to a huge request for emergency supplies like food, medicines, shelter, water and other resources, effective and efficient emergency actions should be implemented for success of relief aids operation. Delivering needs with right quality and quantity, at the right time and place to the right people need it the most are the main duty and responsibility of logistics (Safeera et al., 2014).

Similar to the private sector, the humanitarians have to focus on functionality of supply chain management approach to organize and effectively coordinate different partners thought the relief process. Although humanitarian logisticians can learn from and work with private sector logisticians their work in the context of a natural or man-made disaster is very different from logistics in the business context (Rolando & Wassenhove, 2009). Unlike private sector, humanitarian organizations regularly have to contend with variety of stakeholders, like government, donors and Medias, who have different interest and beliefs. (Journal of Operational Research Society, 2006:475-477).

Logistics and Humanitarian relief operations go together in their functions, like two sides of a single coin. Without efficient support of logistics it is impossible for humanitarian action to be successful. According to Thomas (2003), owning to three main reasons, logistics is important in humanitarian relief operations. Firstly, the preparation phases; logistics should engages in identifying need, purchase of supplies and prepositioned stock. Secondly, logistics should also be

supported by providing water, food, medication and shelter for the logisticians themselves on the site. Thirdly, logistics is also used to document all events and generate lessons for future use.

2.1.4 Principles in Humanitarian Logistics

There are four basic principles that govern humanitarian aid: humanity, neutrality, impartiality, and independency. These principles were officially recognized by the 1949 Geneva Conventions (UNOCHA, 2006). UNOCHA defines the four guiding principles as follows:

- **Humanity:** Human suffering must be addressed wherever it is found, with particular attention to the most vulnerable.
- **Neutrality**: Humanitarian actors must not favor any sides in harmed conflicts or other disputes.
- **Impartiality**: Humanitarian action must be provided solely on basis of need, without discrimination
- **Independence**: Humanitarian action must be autonomous from the political, economic, military or other objectives.

2.1.5 Actors in Humanitarian Logistics Management

Immediately after Second World War, number of humanitarian actors have raised with different kinds of service provision. UN agencies, the International Red Cross/Red Crescent Movement, non-governmental organizations (NGOs) such as Humanitarian Coalition member agencies, military institutions, local government institutions and donor agencies, Logistics service venders and other third party service provider institutions are considered as actors that are involved in providing aid for the affected people (Bui, et al, 2000).

2.1.6 Humanitarian Organizations and Their Missions

Humanitarian organization always strive to promote human welfare, provide relief assistance for people who affected by disaster like armed conflict, drought and famines. Sometimes these organizations are also called relief societies. With the missions of alleviating human suffering in different manmade and natural disaster, they usually engaged in direct aid such as providing food, clothing, and medical supplies, as well by advocating for human right or working to foster sustainable development through empowering, education and training.

Ahmed (2016) sited different humanitarian actors who work together with United Nation to collect funds globally for affected people. These are;

- WHO- The World Health Organization
- UNHCR- United Nations High Commissioner for Refugees ,
- IFRC- International Federation of Red Cross and Red Crescent Societies,
- NGOs- International organizations like CARE, Medecins Sans Frontieres (MSF), World Food Organization (WFO) and World Vision,
- National and local humanitarian organizations (e.g. ERCS)

For their effective service some Humanitarian organizations also include different logistic units like; procurement, warehousing, fleet management, transportation, asset management, building management, security, and information technology (IT), radio communications…etc.(Ahmed, 2016).

2.1.7 Humanitarian Logistics Practice

Today, humanitarian logistics face an increasingly complex and dynamic practice fraught with multiple interdependent responsibility. After onset of a disaster, the humanitarian organizations engage in collecting and disseminating emergency resource to affected areas, but, there are several question to be answered like; who to holds, where to get and who delivers the emergency resource, etc. (Jiang & Yuan 2018). Conceptually this study focus on five major practices of humanitarian logistics. These are situation assessment, procurement management, transportation management, warehouse management and distribution management practices.

2.1.7.1 Situation Assessment

In conducting situational assessment humanitarian organization can assess and identify the type, and nature, intensity and specific location of the disaster area as well as the needs of the affected people. It also involves in prioritizing, designing and developing of action plan based on the information obtained and the need which improve the quality and immediate response (Arii, 2013). The followings are some of the common activates of situation assessment includes; preparedness planning, data collection, interpretation, forecasting, reporting, and monitoring are some of the common activities of situation assessments.

OCHA (2012) described five elements of a good Assessment Practices as step to follow. The fires one is related to provision of actual information and conducting on time analysis, the second is ability to provide relevant information thought the course of crisis, the third is ability to provide the most relevant information with well analyzed decision, the forth one is framing the scope of the problem and ultimate decision to be taken, and finally, recognizing the assessment by concerned experts and with the involvement of people from disaster affected areas (OCHA 2012).

2.1.7.2 Procurement Management

Procurement management in a humanitarian organization has a different purpose compared to commercial organization. The objective of procurement process in humanitarian organization is to ensure and the timely and continuous availability of goods and services to meet identified need in a disaster situation. This involves identifying the source and choosing system to acquire the goods and services (PAHO, 1999). Emergency response procurement focuses on fast order placement and on time delivery at a best price. In most case governments and organizations prefer to buy from local market for purpose of avoiding dalliance and to assist the local economy, while some others organizations look for their regular suppliers for better quality and price.(Moeiny & Mokhlesi, 2011)

Effectiveness of any emergency response is directly determined by the effectiveness of the procurement process in alleviating suffer, mitigating material damage, and reconstruction program (Ali et al., 2015).

Sometimes pre-disaster procurement might be mandatory to prepositioning emergency need relief items, while the amount of inventory to be prepositioned should be small in order to avoid unnecessary inventory caring cost (Balcik and Beamon 2008). In most case, disaster is irregular in its very nature and the location, timing and severity of a disaster are unknown, hence, sometimes post disaster procurement would be essential in relief operation (Balcik et al. 2010).

2.1.7.3 Transportation Management

Transport plays a key role in mobilizing relief supplies and people to help affected people through humanitarian assistance reach affected areas. In logistic process, it is obvious that

transport plays as linking-services in connecting the humanitarian organization, the need of affected people, and the affected people themselves.

However, managing transportation in humanitarian operation is not an easy task. The emergency relief process may be hindered because of different challenges like mismanagement of transport, poor infrastructure in disaster affected area, conflict in relief aid needed zones, and government bureaucracy can affect delivery and distribution of relief cargos to the needy (Wassenhove. 2006). Therefore, planned and strategic measures has to be taken to solve the problems, establishing most resilient transport management system, and multimodal transportation should be considered during emergency responses (Masaba, 2015).

2.1.7.4 Warehouse Management

Warehouse is another important function of humanitarian logistics used to store all essential goods needed for disaster response planning. Warehousing should be designed to protract the relief materials from contamination, damage, and thefts, and organized to assist deliveries to the right person, at the right place, on time, labeled correctly, loaded onto the right vehicle, with sufficient time to meet delivery schedule and to ensure cost-efficient operation that delivers value for money (Richards, 2014).

Wrong warehouse site selection, poor warehouse design, weak organization & management of stock will hinder the humanitarian emergency relief operation which can be resulted in loss of large number of people and material involving with high economic damage (Pazour & Carlo, 2015).

2.1.7.5 Distribution Management

The primary goal of the humanitarian logistics function is to deliver relief items to people affected by the disaster, based on existing needs, fair and efficiently controlled to avoid wastes, minimize shortage, and reduce cost of ordering, transporting and holding goods. Hence, any relief items should be disseminated by considering the demand required against and the stock at hand (PAHO, 1999).

The distribution of aid supplies in emergency response operation follows 4 steps of process, according to Balick et al. The frits step is the process of inception of relief items from different locations to entry port, while the second step concerned with the consignment of relief items from ports to central warehouse. The third step involves with the transportation of relief items from central warehouse to local distribution centers while the last steps engaged in distribution of relief items goes from local distribution centers to target beneficiaries (Balick et al. 2008).

2.1.8 Challenges in Humanitarian Logistics

Humanitarian logistics is known in its complexity and challenging nature in field of logistic particularly, related to emergency relief response operation .Different researchers have found out and elaborated different types of challenges concerning humanitarian logistics or supply chain managements. For instance; Agostinho (2013), identified the following major challenges related to humanitarian logistics: poor infrastructure, uncertainty, urgency, long lead time, lack of information sharing, lack of continuous fund source, poor communication system and weak transportation system. From this finding, one can easily understand that the challenges that humanitarian organizations are face can be internal or external.

Altay (2008) also distinguished those different humanitarian logistics challenges that have affected humanitarian organization performance like coordination and collaboration, together with budget issues, procurement, information communication, infrastructure, and standardization of relief. Similarly, lack of equal communication and information sharing interims of resource management are challenges that humanitarian organization has faced (Tatham and Spens, 2011).

According to Nickerson (2013), cited in Adan & Kising'u (2018), huge amount of dollars are coordinated and allocated annually from international donors by humanitarian organization for the purpose for humanitarian operation, however the majority of humanitarian organization face finical flexibility when responding to emergency. On other hand, there are other challenges related to humanitarian staffs, for instance; stressful events may produce acute anxiety and lead in some cases to burnout and Post Traumatic Stress Disorder. Hence, empowering and reinforcing humanitarian workers who work in difficult situation is important (Pascale, 2006).

Hence, it was one of the objectives of this study to identify and describe the major internal and external challenges of the study area, ERCS.

2.1.9 Humanitarian Logistics Performance

Humanitarian performance is refers to an effective cooperative performance of a complex system of international, national and locally-based organizations, which have the ultimate goal of saving human lives, mitigate damages, reconstruction of the community, enhancing protection mechanisms for the occurrence of such situations as well (Dorit, 2013). Further Dorit explained, effective performance means is executing of work in a manner of humanitarian values, rising and implementing enough resources in order to ensure well management, accountability, sustainability and good quality of goods to supply (Dorit, 2013).

Poor standardization, lack of clear and easy working system and tools, and incompetency employees, has usually affected humanitarian logistics performance (Schulz & Heigh, 2009. In the same vine, shortage of funds assigned to the humanitarian action and weak coordination among humanitarian organization are more hindered the process which have complicated both the regularity of performance measurements, and its real execution (Abidi et al.,2014).

Nowadays, logistics is the most significant and expensive part of any emergency response operation, hence measuring the humanitarian logistics performance has become very essential for all humanitarian actors, engaged in relief aid operation (Van Wassenhove, 2006). Therefore, this study was focused on three selected performance indicators (Reliability, Responsiveness and Cost) reviewed from different literatures, based on its significance in assessing performance of humanitarian logistics.

2.1.9.1 Reliability

Reliability refers to performance capacity that determine the exclusion of tasks in terms of accuracy, time and quality (Fritz Institute, 2013). Reliability is a significant tool used to analyze situation in humanitarian relief operation after onsite of a disastrous event. It evaluates the situation on ground compared to the capacity of the organization in delivering the necessary materials in the right time with good quantities and qualities. Reliability reveals how reliable the whole humanitarian supply chain is (Lu et al., 2016). For different reason reliability could be

errors which can affect the whole humanitarian logistic process. Hence, it needs careful attention of humanitarian logistics personnel.

2.1.9.2 Responsiveness

In humanitarian operation, responsiveness refers to how urgently or immediately tasks are performed compared to the time required for emergency response (Fritz Institute, 2013). It indicates the response time for emergence relief supplies on base of order fulfillment cycle time. As a result of uncertain event in humanitarian operation, humanitarian relief organizations are usually face different risks that could force the organization to tack a quick response (Lu et al., 2016). Responsiveness is one of the most significant performance indicators in humanitarian relief chain (Sahebjamnia et al., 2017).

2.1.9.3 Cost

Cost is one of the major measurements of financial performance of logistics. The source of cost that related to humanitarian logistics are like sourcing, inventory management, delivery, and risk mitigation whereas, the main costs in humanitarian logistics includes: inventory holding, supplies, and distribution costs (Lu et al., 2016). Type of goods being held, remote location, local tariffs and tax, and unpredictable demand in the supply chain will increase distribution costs in the humanitarian chain (Sahebjamnia et al., 2017). Assessing and measuring all cost related issue in humanitarian logistic operation is important to decrease potential costs in some areas (Beamon & Balcik, 2008).

2.2 Empirical Literature Review

2.2.1 Practices, Challenge and Performance of Humanitarian Logistics

The challenge related to humanitarian operation has internal and external characteristics. For instance, according to a study conducted in Zimbabwe, most the humanitarian relief logistics challenges and problems source from poor political and economic situation prevailing in the country. This also resulted in less interest to participate by the donors, lack of professional personnel, weak currency, unnecessary interference between local and central government, absence of rule and regulation, weak currency, customs delays and political violence. Moreover, the emergency relief aid work affected by poor infrastructure, inadequate information and

communication technologies, increased rate of beneficiaries and a donor-dependency syndrome (Mbohwa, 2010).

Similarly a study conducted by Getnet (2020), on Save the Children International Ethiopia (SCE), the empirically test revealed positive relationship between the independent variable (challenge) and the dependent one (logistics performance), and the regression analysis also had a significant effect on the logistics performance of the organization with 48.2% of the variability in organizational performance.

Sara (2020) conducted a research related to humanitarian logistics in Care Ethiopia, and the stud identified different challenges like: security and infrastructure issues, poor coordination and collaboration with multiple players and cultural factors, delays, lack of knowledge sharing, and poor information communication system.

Dessalegn (2018), in his study titled as "Assessment of *Humanitarian Supply Chain Management Challenges on Performance: The case of World Food Program- Ethiopia*" revealed that the supply chain management challenges resulted in inefficiency and ineffectiveness of the whole supply chain process in humanitarian relief delivery. High cost of operation, and increased lead time seriously affected performance of the organization while poor infrastructure, poor warehouse facilities, and shortage of transportation facilities were the major problems that the organization faced.

Seid (2020) conducted a research titled as "analysis of factors affecting humanitarian logistics performance in International Medical Corps Ethiopia", the study revealed that IMC performed at moderate level in terms of reliability, agility, cost, responsiveness and asset Management, similarly the general performance level of the organization were also moderate.

Fathalikhani, et al., (2020), stated that governments usually encountered budget shortage while increasing demand for humanitarian assistance beyond planned capacities, which affects the capacity of the government to properly manage the relief operation. Therefore, he suggested, cooperative and collaborative action with the international and local NGOs is mandatory. to enhance effective humanitarian relief action.

A study conducted d by **Abdifatah (2010)** on SCM practice and their impact on performance among humanitarian organization in Kenya showed that different challenges that affects humanitarian supply chain like customs delays, shortage of fence, shortage of transport, and inability to forecast disaster. The inferential statistics also revealed that very strong positive correlation between dependent and independent variables of the study while 85.7% of humanitarian supply chain performance was explained by regression equation.

Wolde (2019) conducted a research on practice challenge and performance of HL in plan international Ethiopia. According to the result of this study, the overall performance of plan international Ethiopia which includes reliability, flexibility, responsiveness, and asset management were found to be moderately satisfactory while the overall humanitarian logistics practice which were indicated by situational assessment, procurement, transportation, warehousing and Distribution were poorly practiced with the mean result of 1.5, 1.68, 1.47, 1.94, and 1.74 respectively.

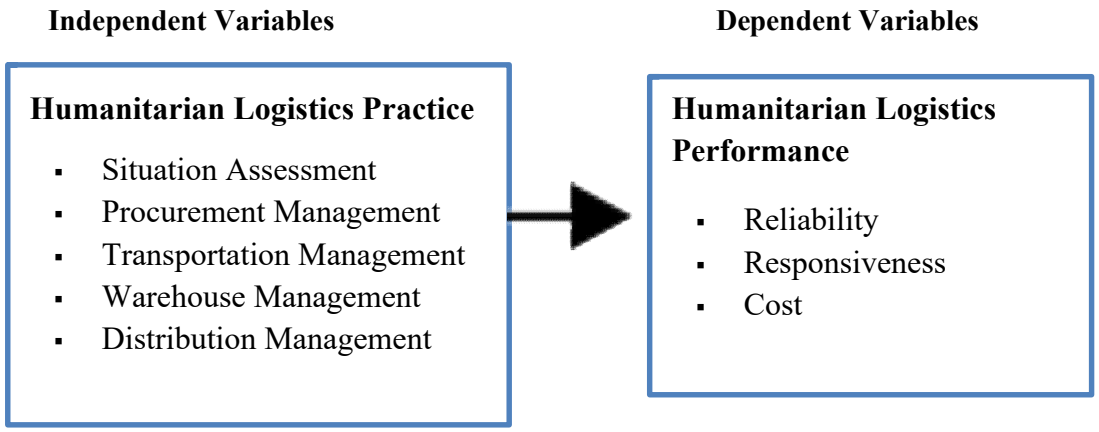
2.3 Summary of Research Gap

Given that relief aid assistance to any disaster affected people in any country and humanitarian organization, humanitarian logistics is can play a significant roles in application of limited resources assigned for humanitarian expenditures. There is a lot research conducted on the issues of humanitarian supply chain management and a lot of challenges have been identified. A number of challenges affecting the humanitarian supply chain system have been identified from different perspectives of various countries, organizations, and based on the nature of disaster. However, these studies have not yet adequately addressed the issues of humanitarian logistics among the humanitarian organization, as different organization can face various obstacles from different context like; internal external situation. Most researches that this study reviewed centers on either challenges and/or performance of Supply chain Management/SCM/ in humanitarian organization, whereas the specific logistics practices in humanitarian organizations have not been researched on fully to understand context dependency of humanitarian logistics performance. In this regarded, the researcher motivated to conduct an assessment on humanitarian logistics practice and its effect on performance the case of Ethiopian Red Cross Society /ERCS/.

2.4 Conceptual Framework

Evidences have shown that there are different challenges that can affect the humanitarian logistics performance in relief response operation. Various literatures, researches and performance reports have justified that these challenge have impacted the efficient and effectiveness of humanitarian logistics performance. These study, however, only focuses on determining effects of humanitarian logistics practices (i.e. Situation Assessment, Procurement Management, Transportation Management , Warehouse Management, Distribution Management) on humanitarian logistics performance(Reliability, Responsiveness and Cost) delivered by ERCS, as stated on diagram.

Figure 2.1: Conceptual framework



Source: Modified from Adan & Kising'u (2018)

CHAPTER THREE

3. RESEARCH METHHODOLOGY

Introduction

This chapter presents the research area, approach, methods and design being used by the study, while indicating the population and issues related to sampling technique, sample size determination, data source and type, and data collection procedures. Moreover, the chapter outlines data analysis, ethical consideration and validity and reliability of the study.

3.1. Description of the Stud Area

The Ethiopian Red Cross Society (ERCS) is one of the known humanitarian organizations striving to serve people affected by natural and manmade disasters through the country. ERCS is among the major prominent humanitarian actors where substantial works related to humanitarian logistics and supply chain management are done throughout the country to support its program. ERCS has been working on emergency response programs to alleviate human suffering caused by natural or manmade disaster. Moreover, ERCS has provided humanitarian and emergency responses to the affected people in different part of the country due to the recently occurred ethnic-based conflicts and drought which caused many people internally displaced. There for, ERCS was appropriate research area for this study.

At this time the ERCS has a structure containing twelve Regional Offices (i.e. Addis Ababa, Afar, Amhara, Benishangul-Gumuz, Dire Dawa, Gambella, Oromia, Harai, SNNP, Somalia Tigray and Sidama region), thirty three(33)Zonal Branches and one hundred thirty one (131) District/Woreda Branches, five hundred ninety nine (599) Woreda Red Cross Committee and 5871 Kebele Red Cross Committees. The head office of ERCS is found in Addis Ababa, capital city of Ethiopia. Hence, the main source of information for this study was ERCS headquarter, at Addis Ababa.

3.2. Research Approach

Good research chooses to go for quantitative or qualitative or sometimes, a combination of the two types of research based on its problem statement and the study objectives (Cooper & Schindler, 2006). According to Creswell (2013), mixed research method is suitable for the development of concepts which help us to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to the meanings, experiences and views of the participants.

Depending on the types of data that were used, the study used mixed approach, which includes both qualitative and quantitative study. A mixed approach used because the combination of the two approaches was though to help in providing more information for this study. Quantitative approach used in analyzing data collected in form of questionnaire to obtain their findings through formal and systematic measurement. On the other hand, qualitative approach was used to analysis of primary data obtained from interviews and without involving formal measurement (Khawaja, et al., 2012).

3.3. Research Design

Research design is the plan and structure of investigation conceived to obtain answers to research questions that includes an outline of the research work from hypothesis, methods, and procedures for collecting and analyzing data and presenting the results in a form that can be understood by all (Mugenda, and Mugenda, 2003).

For this study both descriptive and explanatory research type were used. Descriptive studies are often defined as studies that are concerned with finding out 'what' is, and describe a situation, subject, behavior or phenomenon without influencing or manipulating the variable in any way Leary (2012). Hence, a descriptive study design was used to assess and describe the practice and challenges of humanitarian logistics. Moreover, as descriptive study design do not provide direct cause and effect relationship, an explanatory research design was also used to determine the effects of independent variable (humanitarian logistics practice) on the dependent one (humanitarian logistics performance).

3.4. Population and Sampling

The population of the study is consisted of respondents from headquarter located in Addis Ababa Ethiopia. For this particular study, the populations were permanent and contract workers of ERCS who had work experience in the logistics area and its related supportive unite. Workers of ERCS, at headquarter, particularly, those specialists who had working experience in disaster rescue and humanitarian relief areas involved in humanitarian logistics related activity were selected for this particular research.

Concerning the sampling method, this study considered the census method due to the small size of population size. According to Baffour, et al., (2013), a census is an attempt to gather information about every individual in a population. The main reason for a census is the individual level of enumeration. Currently, the Headquarter of ERCS has a total employees of 160, both contract and permanent (ERCS, 2021). However, this research has focused on 80 employees who have homogenous relationship in terms of the nature of their duty and responsibility that matches with the objectives of this study. Therefore, the 80 employees who have a relationship with logistics and its related supportive units were considered as both source population and sample size for this study.

3.5. Sources of Data and Types

The study used both primary and secondary sources of data in its construction. The primary data were collected mainly through of questionnaire of closed-ended as well as through interviewing concerned management staff of ERCS. This study also used secondary data from different sources like; published books, articles, official documents and reports, and internet were extensively reviewed as a reference for this particular study.

3.6. Data Collection Procedures

The primary data were collected from ERCS's headquarter, by distributing questionnaire. Interviews were held with some selected management staffs (preparedness and response managers and logistics and supply chain leader at headquarter). Secondary data were also collected from secondary sources.

For the purpose of collecting the necessary information, the researcher adapted a standardized questionnaire from the work of Adan & Kising'u (2018), Saeyeon et al., (2022) & Seid (2020). To assess the humanitarian logistics practice and its performance, a total of 8 constructs and 30 items were adapted. The questionnaires consist of two parts. These are: Socio- demographic characteristics of respondents, and level of agreement of respondent on humanitarian logistics practice, and performance.

Close-ended questions were developed in a five point Likert scale and firsthand data were collected from the targeted respondents who are employees of the organization whose job is related humanitarian logistics and humanitarian relief operation. Respondent were rated their answers from strongly disagree to strongly disagree, based on five point Likert scale, in which they abled to express their degree of agreement and disagreement for each questions. The questionnaires were made short, precise and clear to get necessary information from the respondents. Moreover, semi-structural interviews were held with selected management staffs to asses and identify challenges related to humanitarian logistics performance.

3.7. Data Analysis

The data collected through questionnaires were processed, analyzed and interpreted according to descriptive information following the research questions by using SPSS version- 24 software. Descriptive analysis techniques like frequency distribution, percentage, mean score and standard deviation were used to determine the scores result. Inferential statistics were also used to explain the relationship of dependent and independent variables. Karl Pearson's coefficient of correlation was used to determine the relationship between dependent variable (humanitarian logistics performance) and independent variable (humanitarian logistics practice). It was done for each of items relating to the research question and objective. The research also used a multiple regression analysis to see the significant effect of humanitarian logistics practice on the performance of humanitarian logistics. Finally the analysis result was presented in the form of table and figures with its narration.

3.8. Ethical Consideration

When conducting a research the wellbeing and interest of the participants had been prioritized. 'A letter for support' had been delivered from the university to ERCS, headquarter. The objective of the study was explained clearly and politely to all respondents of this study at ERCS. Moreover, Participants were also told that the information obtained through inquiry would be kept confidential and, it would be used only for academic purpose. Hence, the target groups of this study abled to participate freely. Moreover, the researcher recognized pervious investigation results and properly cited the source for those concepts taken as base for this study.

3.9. Validity and Reliability

In order to keep the validity of this research the researcher has gone through two processes: the first one is using *standardized questionnaire*; to make the question more clear and avoided ambiguity the researcher was able to use standardized questions items which was adapted from the work of Adan, & Kising'u (2018), Saeyeon et al., (2022) & Seid (2020). The second one was *reviewing the questionnaire:* with the cooperative efforts of selected humanitarian logistics professionals at ERCS, the questioner was revised as per their comment and consult so as to address the context of the organization.

Similarly, two efforts have been exerted to check the reliability of the study. The first one was *conducting a pilot test*: to check the worthwhileness of the questions stated in *questionnaire* form, prior to the real data collection, the researcher had distributed small number of questioners among selected staff members of humanitarian logistics professionals at ERCS. Based on this information obtained, some kinds of adjustment had been made on some items of the questions. Finally, Cronbach's alpha values were tested to check internal consistency of this study, in which greater than 0.7 values are acceptable, as a rule.

Table: 3.1. Reliability Statistics

Variable	**Cronbach Alpha**	**No. of Items**
Aggregate Cronbach's Alpha Values	0.945	30
Situation Analysis	0.892	4
Procurement Management	0.73	4
Transportation Management	0.82	4
Warehouse Management	0.88	4
Distribution Management	0.93	3
Reliability	0.76	***4***
Cost	0.87	***3***
Responsiveness	0.79	***4***

Source: Study Survey, 2023

As indicated on table 4.1 below, cronbach's alpha result of the 8 dimensions ranged from 0.73 to 93. Cronbach's alpha result of the overall scale was found to be 0.945, which is greater than the minimum value 0.7. Hence the value of cronbach's alpha has proved the reliability of the instrument.

CHAPTER FOUR

4. RESULTS AND DISCUSSION

Introduction

This chapter presents the data analysis, interpretation, and discussion of the data collected through questionnaires from humanitarian logistics workers and related supportive work unites, and interview result from management staff of ERCS.

Regarding response rate, exactly 85 questionnaires were distributed among ERCS censes employees of humanitarian logistics and related work unit at ERCS. Out of 85 questioners, 80(94%) correctly filled questionnaires were returned while 3(3%) questionnaires were not returned, and still 2(2%) of the questionnaires were discarded because it missed/skipped some important information.

4.1. Socio-demographic Characteristics of Respondents

As indicated on Table: 4.1 below, five variables of the demographic characteristics of respondents were illustrated as Age, Gende, Educational level, Department/position/ and Work experience.

Table: 4.1. Socio-demographic Characteristics of Respondents

Qn.	Variable	Categories	f	%
	Gender of Respondents	Male	53	66.3
		Female	27	33.8
		Total	**80**	**100.0**
2	Age of Respondents	18 to 25 years old	1	1.3
		26 to 30 years old	4	5.0
		31 to 35 years old	29	36.3
		36 to 40 years old	11	13.8

		41 to 46 years old	25	31.3
		47 and above years old	10	12.5
		Total	**80**	**100**
3	Educational Level of Respondents	Diploma	2	2.5
		First Degree	48	60.0
		Master's Degree	28	35.0
		Other	2	2.5
		Total	**80**	**100.0**
4	Current position/department held in the organization	Management Staff (Manager& Coordinators)	11	13.8
		Logistic & Supply Chain Specialist(seniors)	18	22.5
		Logistic & Supply Chain Staff (Officer)	26	32.5
		Finance Officers	13	16.3
		Other	12	15.0
		Total	**80**	**100.0**
5	Years of Experience in the Organization	Less than 2 years	12	15.0
		2-5 years	17	21.3
		6-10 years	28	35.0
		11-15 years	11	13.8
		More than 15 years	12	15.0
		Total	**80**	**100.0**

Source: Study Survey, 2023

As shown on table-4.1above, the gender distribution of respondents indicates that 53(66.36%) are male and 27(33.8%) are female. This data show that the number of male participants exceed the number of female participants.

Interns of their age, the majority of respondents classified from 31-35 & 41-46 with percentage of 36.3.0 & 31.3.0 respectively. Regarding their educational level; First Degrees is 48 (60.0%) while Master Degree is 28(35%). This data depicts that large hand of participants were on their productive age with qualified professional knowhow that they could offer themselves for the accomplishment of organizational objectives. This also justify that the respondents were capable enough to critically answer the research questions.

As illustrated on Table: 4.1 above, respondents answered about their Position/work unit/ in the organization; accordingly the 11(13.8) were management staff (managers and Coordinators), 26(32.5%) were logistics and supply chain officer, 18(22.5%) were the logistics and supply chain specialist (senior officers and team leaders), 13(16.3) were from finance department and the rest 25(31.3%) were in other profession like disaster risk management, disaster preparedness, response work unit and Engineering. Concerning their Experience, 35.0 percent of them had work experience from 6-10 years subsequently 15.0 percent with 2-5 years' work experience and 15.0 & 13.0 percent were more than 15 and between 11 and 15 years respectively. This indicates that almost all participants' role directly or indirectly relates to humanitarian logistics activities with high experience as a result of the many years they had worked in the organization

4.2. Descriptive Analysis of Humanitarian Logistics Practices of ERCS

In this section, the categories such as situational analysis, procurement, transportation, warehousing, and distribution management issues are part of the analysis. Respondents rated their answers from strongly disagree to strongly agrees, based on five point Likert scale, in which they abled to express their degree of agreement and disagreement for each questions. Hence, this study used mean range to indicate the practiced level, categorized as; 4.21-5.0 for extensively practiced, 3.41- 4.2 for well-practiced, 2.61- 3.4 for moderately practiced, 1.81- 2.6 for poorly practiced, 1.0 -1.8 for never practiced (Dawes, 2008).

4.2.1. Situational Assessment

Responses on situational analysis are provided here in this part.

Table: 4.2. Situational Analysis

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS used to assess the situation of the disaster in terms of the volume, type and urgency of supplies needed.	f	4	8	16	41	11	80
		%	5.0	10.0	20.0	51.3	13.8	100
		M = 3.59; SD =1.02						
2	The demography of displaced population and the size of vulnerable population are assessed by ERCS.	f	9	11	15	36	9	80
		%	11.3	13.8	18.8	45.0	11.3	100
		M = 3.31; SD = 1.19						
3	ERCS used to assess the situation in the affected area is in terms of how the supplies will be stored and delivered.	F	2	15	26	28	9	80
		%	2.5	18.8	32.5	35.0	11.3	100
		M = 3.34; SD =0.99						
4	ERCS assess the security of the staff /disaster relief teams/ and supplies in the affected area.	F	-	23	15	30	12	80
		%	-	28.8	18.8	37.5	15.0	100
		M = 3.39; SD =1.06						
	Cumulative Mean	***M= 3.41; SD= 1.10***						

Source: *Study Survey, 2023*

As indicated on table: 4.2, one of the primary question items in situational analysis was the analysis made in terms of the *volume, type*, and *urgency* of supplies needed, had a result of 3.59 mean score and 1.02 standard deviation, while the next item of the situation assessment made on *demography* of displaced and the *size of vulnerable* resulted in 3.31 mean score and 1.19 standard deviation. Likewise, for analysis conducted in terms of how supplies will be stored and delivered, the result shows that 3.34 mean score and 0.99 standard deviation. The last item was

about assessment of the *security of the staff* /disaster relief teams/ and *supplies* in the affected area, the result shows 3.39 mean and 1.06 standard deviation. Generally, the descriptive statistics result of the SPSS revealed that the cumulative mean of the situation analysis practice in ERCS is 3.41 with standard deviation of 1.10. This indicates that situational analysis was well practiced in ERCS.

4.2.2. Procurement

This part of the analysis mainly shows the responses on procurement practices.

Table: 4.3 Procurement practices

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS's procurement policy supports quick acquisition of supplies.	f	11	21	16	23	9	80
		%	13.8	26.3	20.0	28.8	11.3	100.0
		M = 2.98; SD = 1.25						
2	ERCS's procurement department effectively manages in kind donations of goods and procurement of required supplies.	f	6	19	21	27	7	80
		%	7.5	23.8	26.3	33.8	8.8	100.0
		M = 3.13; SD = 1.11						
3	ERCS's Maintain a proper match between the requested supplies of relief items and the volume of supplies.	f	8	7	17	38	10	80
		%	10.0	8.8	21.3	47.5	12.5	100.0
		M = 3.44; SD = 1.13						
4	Usually ERCS prefers making procurement decisions after a disaster occurs.	f	10	12	22	22	14	80
		%	12.5	15.0	27.5	27.5	17.5	100.0
		M =3.23; SD = 1.26						
	Cumulative Mean	***M = 3.14; SD = 1.19***						

Source: Study Survey, 2023

ERCS's *procurement policy* supports quick acquisition of supplies with a mean result of 2.98 and standard deviation of 1.25 while the procurement department *effectively manages* in kind donations of goods and procurement of required supplies resulted in 3.13 mean score and 1.11 standard deviation. Supplies that are required by ERCS maintain a proper match between the requested *supplies of relief items* and the *volume of supplies* resulted in 3.44 mean score and 1.13 standard deviation. Preference of making procurement *decisions after a disaster* occurs also resulted in 3.23 mean score and 1.26 standard deviation. The descriptive statistics result of the SPSS revealed that the cumulative mean of the procurement practice in ERCS is 3.14 while standard deviation 1.19. Therefore, this analysis indicates that the procurement operation was moderately practiced in ERCS.

4.2.3. Transportation

This part of the analysis also shows how the transportation was practiced in ERCS

Table: 4.4. Transportation

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS delivers the right product to the right person at the right time	F	6	18	12	32	12	80
		%	7.5	22.5	15.0	40.0	15.0	100.0
		M = 3.34; SD = 1.18						
2	ERCS always avails necessary modes of transportation for the movements of supplies and people.	F	4	27	12	27	10	80
		%	5.0	33.8	15.0	33.8	12.5	100.0
		M = 3.13; SD = 1.17						
3	There are sufficient transport companies that provide transportation services for ERCS, during emergency works.	F	2	28	12	24	14	80
		%	2.5	35.0	15.0	30.0	17.5	100.0
		M = 3.25; SD = 1.19						
4	ERCS uses various transport optimization	F	4	18	16	37	5	80

	models to deliver supplies with the least cost possible.	%	5.0	22.5	20.0	46.3	6.3	100.0
		M = 3.26; SD = 1.04						
	Cumulative Mean	***M = 3.25; SD = 1.15***						

Source: Study Survey, 2023

As can be seen from the Table: 4.4 above , delivery of the right supplies to the right person at the right time by ERCS scored 3.34 mean and 1.18 standard deviation, while *accessibility* and use of the necessary modes of transportation for the movements of supplies and people had 3.13 mean score and 1.17 standard deviation. The availability of sufficient transport companies that provide transportation services for ERCS during emergency works was found to have a mean of 3.25 and a standard deviation of 1.19 whereas using various transport optimization models to deliver supplies with the least cost possible resulted in 3.26 mean score and 1.04 standard deviation. The cumulative mean of the transport management practice had 3.25 and 1.15 for mean and standard deviation respectively. Therefore, this analysis shows that transportation management practiced at ERCS was at its moderate level.

4.2.4. Warehousing

Table: 4.5. Warehousing practices

Qn.	**Item**		**SD**	**D**	**N**	**A**	**SA**	**Total**
1	ERCS secures sufficient warehouse to temporarily store supplies during disasters.	f	2	12	16	40	10	80
		%	2.5	15.0	20.0	50.0	12.5	100.0
		M = 3.55; SD = 0.98						
2	Warehouse location is very accessible for delivery of the perfect order in disaster situations.	f	9	26	13	26	6	80
		%	11.3	32.5	16.3	32.5	7.5	100.0
		M = 2.93; SD = 1.19						

3	ERCS always ensures damage free warehouse for efficient delivery of goods to the beneficiaries.	f	8	16	19	28	9	80
		%	10..0	20.0	23.8	35.0	11.3	100.0
		M = 3.18; SD = 1.18						
4	ERCS apply the right warehousing management system that makes it easier to receive, store and distribute the goods with minimum cost plan.	f	4	22	16	33	5	80
		%	5.0	27.5	20.0	41.3	6.3	100.0
		M = 3.16; SD = 1.06						
	Cumulative Mean	***M = 3.21; SD = 1.10***						

Source: Study Survey, 2023

Table: 4.4 above point out that half of the respondents agreed to great extent that ERCS secures sufficient warehouse to temporarily store supplies during disasters with mean value of 3.55 and standard deviation of 0.98. Concerning warehouse location accessibility for delivery of the perfect order in disaster situations, the result shows that 2.93 mean score and 1.19 standard deviation. Ensuring damage free warehouse for efficient delivery of goods to the beneficiaries and applying right warehousing management system that makes it easier to receive, store and distribute the goods with minimum cost plan had the mean value of 3.18 and 3.16 respectively, and 1.18 and 1.06 standard division respectively. The overall, the cumulative mean (3.21) revealed that ERCS's warehouse management was practiced at a moderate level.

4.2.5. Distribution

Table: 4.6. Responses for Distribution Practices

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS uses well established distribution centers to ease and timely distribution and minimize cost of operation.	F	11	37	13	15	4	80
		%	13.8	46.3	16.3	18.8	5.0	100.0
		M = 3.45; SD = 1.1						

2	Distribution team has sufficient information as to whom the supplies should be delivered.	F	9	31	19	14	7	80
		%	11.3	38.8	23.8	17.5	8.8	100.0
		M = 3.26; SD = 1.14						
3	ERCS ensures effective distribution of goods by using reliable transportation system.	F	10	35	12	17	6	80
		%	12.5	43.8	15.0	21.3	7.5	100.0
		M = 3.33; SD = 1.17						
	Cumulative Mean	***M = 3.35; SD = 1.14***						

Source: Study Survey, 2023

As shown on Table: 4.6 above, the practice for establishing distribution centers to ease and timely distribution and minimize cost of operation in ERCS resulted in a mean score of 3.45 and 1.1 standard deviation. For practice that the distribution team has sufficient information as to whom the supplies should be delivered scored a mean result of 3.26 and standard deviation of 1.14, while ensuring effective distribution of goods by using reliable transportation system resulted in 3.33 mean score and 1.44 standard deviation. Therefore, this analysis also indicates that the distribution management practiced at ERCS was at a **moderate level** with Cumulative Mean of 3.35.

4.3. Descriptive Analysis of the Main Challenges faced by ERCS/Interview's Result/

A semi-structured interview was held intensively with Humanitarian supply chain coordinator and Disaster preparedness and response coordinator who are senior management staff and most experienced employee of ERCS. The objective of the interviews was to identify and understand the main internal and external challenges that ERCS have faced in humanitarian relief logistics operation. A semi- structured interview held with the two experts revealed that there were different internal and external challenges related to humanitarian logistics practice. There were 10 challenging elements in humanitarian logistics operation that were most uniformly mentioned by the interviewees. The followings are the summery of them.

4.3.1 Internal Challenges

i. ***Information Communication Gap***: IT plays a key role being a source of information and communication in order to improve and effectively implement humanitarian logistic operation during disaster. The accuracy of information given during humanitarian operation can actually matter the efficiency and efficiency of logistic operation. Though, ERCS trays to implement different Communication system like EOC system and purchase different equipment for Radio communication system, still information communication was a challenge for the organization particularly to exchange information with the remote regional branches and workers in disaster affected areas which could hinder the operation of humanitarian responses.

ii. ***Earmarking of Fund:*** ERCS depend mainly on donors for funding to be able to execute their duties. However there were some fund raising strategies that this humanitarian organization has tried to put in practice. Some of these are mobilizing recourses through short code SMS /9400/ & Tele birr system, bank account with short codes / 907/ for local donation, online donation mobilization, digital resource mapping etc.. However, beside its effort to generate funds locally for humanitarian relief and for disaster risk management projects, the organization was still facing difficulty in finding sufficient, appropriate and continuous funding for its works as the number of disaster and disaster affected people increase from time to time in different parts of the country. Furthermore, as a result of the existing stiff competition on resource mobilization, the Government and NGOs are engaged in collecting and raising funds from the community. On the other hand, there were limited resource mobilization skills and consequently, they were not often looking for funds that are available locally, preferring to wait for international donors and government. This is a significant challenge among branch offices.

iii. ***Stock Out:*** as a humanitarian organization, ERCS used to hold stock for emergency need before the onsite of disaster as the devastation is massive, however the organization still face the shortage of stock because the aid need to support affected people has always been high in number and exceed the amount of stocked items.

iv. ***Coordination and Collaboration:*** The coordination and collaboration with all stakeholders (Partner National societies, Non movement partners, the national and local government

association, CBOs and engaging the local communities) can be considered as a good practice. However, still it needs to work hard and scale up this practice throughout its branch office and other key and strategic stakeholders.

4.3.2 External Challenges

i. ***Inflation and increase in the price of fue***l: Owing to inflation an increase in the price of fuel as well as spare parts, the vehicle maintenance and management are becoming very expensive. Similarly**,** frequent electric power interruption increased daily fuel expense for generator. Shortage of goods in the market, frequent increments of market prices and lack of foreign currency for procuring drugs and other relief items are also the main external challenges that ERCS has faced recently.

ii. ***Inefficiency of Transport Companies and Suppliers*:** there are some major humanitarian logistics operations and supplies outsourced to other service delivery companies. However, most of the companies are not capability enough to perform the logistics activities as per their agreement. The main reasons for the low performance of these companies are; limited knowledge and skill in area of humanitarian activity and logistics, shortage of finance, and weak management system. The service and supplies they deliver have sometimes been below the standards and not on time while emergency relief operations require a standby mode system. Generally, as a result of poor performance of the service vender and suppliers there was delay and sometimes poor quality of supplies for the highly-demanding requests for service and supplies during emergency disaster.

iii. ***Deterioration of the relief items***: Relief items for emergency services can be affected by different factors like bad weather condition of the area and the nature of the bad quality of the relief goods itself. Even if ERCS always strive to provide supplies which suit its standards, sometime the hot or cool climate condition, the topography and structural condition of the roads were not only affected the emergency relief items but also the labor force in the humanitarian operation.

iv. ***Poor Infrastructure***: The quality of the infrastructure for pre-positioned warehouse was a concern for ERCS as some of the potential warehouses were located in the poorly developed infrastructures or near to the disaster prone areas. These areas were identified to have low quality of infrastructure which makes the humanitarian relief operation very challenging.

v. ***Poor Safety and Security***: Some of the relief items stocked in the warehouse near to disaster area were high valuation items; for example, food items like flour, corn, wheat and nonfood items like radio-telecommunication systems, medicines, armored vehicles, etc. Security of the location in some disaster area was very challenging for pre-positioning of some relief items due to security issues like an unexpected theft or pilferage particularly in Northern part of Ethiopia. Similarly humanitarian personnel, especially frontline workers, were facing direct and indirect attacks such as threats, harassment and intimidation. In 2021 and 2021, there were different attacks on ERCS humanitarian workers and materials, for instance an ambulance driver was killed and cars and different properties were looted and damaged in Northern part of Ethiopia, particularly.

vi. ***Delay in Custom Clearing Services***: due to bureaucratic work of customs clearing agent and/or other Federal Minster, there was also delays for some purchased or donated items that imported from abroad for humanitarian relief purpose.

4.4. Analysis of Humanitarian Logistics Performance

In this part, sub categories of humanitarian logistic performance are included these are reliability, cost and responsiveness.

4.4.1 Reliability

The following analysis is about reliability of the humanitarian logistic performance in ERCS.

Table: 4.7. Responses to Reliability

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS has exhibited a strong ability to perform logistics tasks as expected.	F	8	30	19	14	9	80
		%	10.0	37.5	23.8	17.5	11.3	100.0
		M = 3.23; SD = 1.17						
2	ERCS delivers the right supplies in the right quantity and at the right time with all the necessary documentation to meet the requested demands.	F	8	35	18	15	4	80
		%	10.0	43.8	22.5	18.8	5.0	100.0
		M = 3.25; SD = 1.06						

3	ERCS delivers a damage-free supply with the correct pattern, hence no return or replacement is required in logistics operation.	F	16	16	14	28	6	80
		%	20.0	20.0	17.5	35.0	7.5	100.0
		M = 2.9; SD = 1.29						
4	There are no complaints reported during the execution of the logistics operation in ERCS.	F	6	9	31	29	5	80
		%	7.5	11.3	38.8	36.3	6.3	100.0
		M = 3.23; SD = 0.99						
	Cumulative Mean	***M = 3.15; SD = 1.12***						

Source: Study Survey, 2023

47.5% (38) of the participants disagreed to the item stated as "ERCS has revealed a strong ability to perform logistics tasks as expected". But 28.8% (23) agreed and the rest 23.8% (19) were neutral**.** This item had a mean result of 3.23 and a standard deviation of 1.17. More than half of the respondents (53.75) show indifferent stand in that ERCS delivers the right supplies in the right quantity and at the right time with all the necessary documentation to meet the requested demands. However, 23.8% (19) agree, and 22.5% (18) chose neutral from the options with a mean result of 3.25 and standard deviation of 1.06.

The other item from reliability variable reviled 40.0 % (32) and 42.5% (34) of respondents tend to remain neutral and agree on the issues of damage free supply by ERCS with the mean value and standardization of 2.78 and 0.99 respectively. About 42.5% of participants agreed and 38.8% of them were tend to remain neutral regarding "no complaints reported during the execution of the logistics operation in ERCS" which resulted in mean result of 3.23 and standard deviation of 0.99. Generally, reliability related to humanitarian logistics performance was found to have 3.15 as a grand mean and 1.12 as a grand standard deviation. This also indicate that reliability of humanitarian logistics performance level of ERCS were moderate.

4.4.2 Cost

This part of the analysis focuses on cost.

Table: 4.8. Responses on Cost

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS applies cost management policy and usually tack cost cutting measures to reduce total cost in its logistics operations.	f	10	17	26	22	5	80
		%	12.5	21.3	32.5	27.5	6.3	100.0
		M = 2.94; SD = 1.12						
2	ERCS's logistics service has reduced total and delivery cost due to damage free and correct supplies.	f	5	14	19	38	4	80
		%	6.3	17.5	23.8	47.5	5.0	100.0
		M = 2.68; SD = 1.02						
3	ERCS has systems designed to make sure that the optimum cost is experienced.	f	7	15	20	34	4	80
		%	8.8	18.8	25.0	42.5	5.0	100.0
		M = 3.11; SD = 1.07						
	Cumulative Mean	***M = 2.94; SD = 1.07***						

Source: Study Survey, 2023

From the total respondents, 33.8% (27) agreed that ERCS applies cost management policy and usually tack cost cutting measures to reduce total cost in its logistics operations .On the other hand, 33.8% (27) disagreed and 32.5% (26) were neutral. This also computed as 2.94 mean and 1.12 of standard deviation. For the second item in the cost, 52.5% (42) of the respondents agreed that ERCS's logistics service has reduced total and delivery cost due to damage free and correct supplies and revealed as 2.68 mean and 1.02, standard deviation. Lastly, 47.5% (38) of the respondents affirmed that ERCS has systems designed to make sure that the optimum cost is experienced. Whereas, 27.6% 22) disagreed, and 25% (20) and this item resulted 3.11 for the mean and 1.07 for the standard deviation. In general, the cost related to humanitarian logistics performance was found to have 2.94 as a grand mean and 1.07 as a grand standard deviation.

Here the mean indicate that cost related to humanitarian logistics were performed at moderate level.

4.4.3 Responsiveness

This part of the analysis presents the responsiveness as sub-category in humanitarian logistic performance. The levels of agreement to the Likert-scale are provided.

Table: 4.9. Responsiveness Practices

Qn.	Item		SD	D	N	A	SA	Total
1	ERCS makes immediate decision at all levels to advance the logistics operations.	F	9	15	14	30	12	80
		%	11.3	18.8	17.5	37.5	15.0	100.0
		M = 3.26; SD = 1.25						
2	ERCS has minimized order fulfillment lead times and optimized inventory levels.	F	7	11	16	40	6	80
		%	8.8	13.8	20.0	50	7.5	100.0
		M = 3.34; SD = 1.09						
3	ERCS provides humanitarian logistics as per their plan and schedule.	F	7	14	13	40	6	80
		%	8.8	17.5	16.3	50.0	7.5	100.0
		M = 3.3; SD = 1.12						
4	ERCS has less capacity to disseminate accurate and timely information due to poor telecommunication infrastructure.	F	12	12	18	28	10	80
		%	15.0	15.0	22.5	35.0	12.5	100.0
		M = 3.2; SD = 1.26						
	Cumulative Mean	***M = 3.27; SD = 1.16***						

Source: Study Survey, 2023

For an item that goes as ERCS makes immediate decision at all levels to advance the logistics operations, more than half of the respondents i.e. 52.5% (42) agreed. But 30.1% (24) disagreed and 17.5% (14) remained neutral. This shows the positive inclination of the participants to the immediacy of

decision in the logistic operation with the mean of 3.26 and standard deviation of 1.25. On the same parameter, 57.5% (46) of the participants agreed that ERCS has minimized order fulfillment lead times and optimized inventory levels. But 22.6% (18) disagreed and 20% (16) were neutral. This item also had an output mean result of 3.34 and standard deviation of 1.12 In addition to the above positive response, more than half of the participants(57.5%) affirmatively respond as ERCS provides humanitarian logistics as per their plan and schedule*;* only a few i.e. 26.3% (21) disagreed and 16.3% (13) remained neutral. This finding also revealed with 3.3 mean and 1.12 standard-deviations. On the dissemination accuracy and telecommunication infrastructure, 47.5% (38%) of the respondents agreed that ERCS has less capacity to disseminate accurate and timely information due to poor telecommunication infrastructure. But 30% (24) of the participants disagreed and the remaining 22.5% (18) were neutral. This item also had a result of 3.2 mean and 1.26 standard deviation score. Overall, the cumulative mean (3.27) revealed that the responsiveness of humanitarian logistic performance level in ERCS were moderate.

4.5. Inferential Analysis of Humanitarian Logistics Practice and Performance

4.5.1. Correlation Analysis /Variable Relationships/

The correlation between constructs of Humanitarian Logistics Practice specific factors (Reliability, Cost and Responsiveness) with humanitarian logistics performance was tested and analyzed as follows:

Table: 4.10. The result of correlation matrix between each constructs and HL performances are

		Reliability	**Cost**	**Responsiveness**	**Humanitarian Logistic performance**
Situational Analysis	Pearson Correlation	***.311*** **	***.360*** **	***.285*** *	***.323*** **
	Sig. (2-tailed)	.005	.001	.010	.003
	N	80	80	80	80
Procurement	Pearson Correlation	***.341*** **	***.498*** **	***.489*** **	***.480*** **
	Sig. (2-tailed)	.002	.000	.000	.000
	N	80	80	80	80
Transportation	Pearson Correlation	***.389*** **	***.472*** **	***.545*** **	***.482*** **
	Sig. (2-tailed)	.000	.000	.000	.000

	N	80	80	80	80
Warehousing	Pearson Correlation	***.314*** **	***.455*** **	***.459*** **	***.435*** **
	Sig. (2-tailed)	.004	.000	.000	.000
	N	80	80	80	80
Distribution	Pearson Correlation	***.452*** **	***.539*** **	***.567*** **	***.532*** **
	Sig. (2-tailed)	.000	.000	.000	.000
	N	80	80	80	80
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Source: Study Survey, 2023

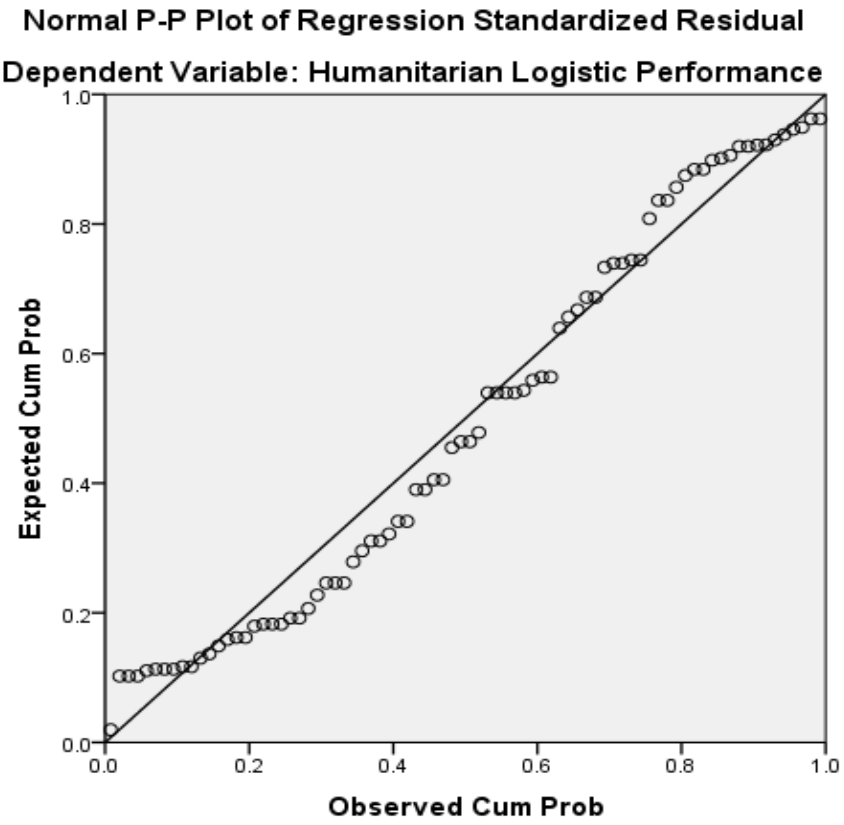
As it is demonstrated in Table 4.10., the results of the Pearson correlation analysis revealed that there was a statistically significant positive correlation between situational analysis and reliability (***r = 0.311, p < .005***), cost (***r = 0.36, p < .001***), responsiveness (***r = 0.285, p < .01***), and Humanitarian Logistic Performance (***r = 0.323, p < .003***). The second sub-category, i.e. Procurement in the Humanitarian Logistic Practices as predictor variable has a statistically significant positive correlation with reliability (***r = 0.341, p < .002***), cost (***r = 0.498, p < .000***), responsiveness (***r = 0.545, p < .000***), and Humanitarian Logistic Performance (***r = 0.482, p < .000***). Transportation has statistically significant positive relationship with reliability (***r = 0.389, p < .000***), cost (***r = 0.472, p < .000***), responsiveness (***r = 0.498, p < .000***), and Humanitarian Logistic Performance (***r = 0.48, p < .000***). Warehouse is also statistically significantly and positively related with reliability (***r = 0.314, p < .004***), cost (***r = 0.455, p < .000***), responsiveness (***r = 0.459, p < .000***), and Humanitarian Logistic Performance (***r = 0.435, p < .000***). Lastly, distribution has positive and statistically significant relationship with reliability (***r = 0.452, p < .000***), cost (***r = 0.539, p < .000***), responsiveness (***r = 0.567, p < .000***), and Humanitarian Logistic Performance (***r = 0.532, p < .000***).

Therefore, the finding revealed that the whole constructs, except the distribution, are weakly and positively correlated to humanitarian logistics performance while the distribution alone resulted in relatively strong and positive correlation with humanitarian logistics performance. This indicates that ERCS has to work more on humanitarian logistics practice for effective and efficient humanitarian logistics performance.

4.5.2. Regression Analysis

The first assumption of working the regression is linearity. As it is depicted below, the linearity assumption is met.

Figure: 4.1 P-P Plot of Regression Standardized Residual

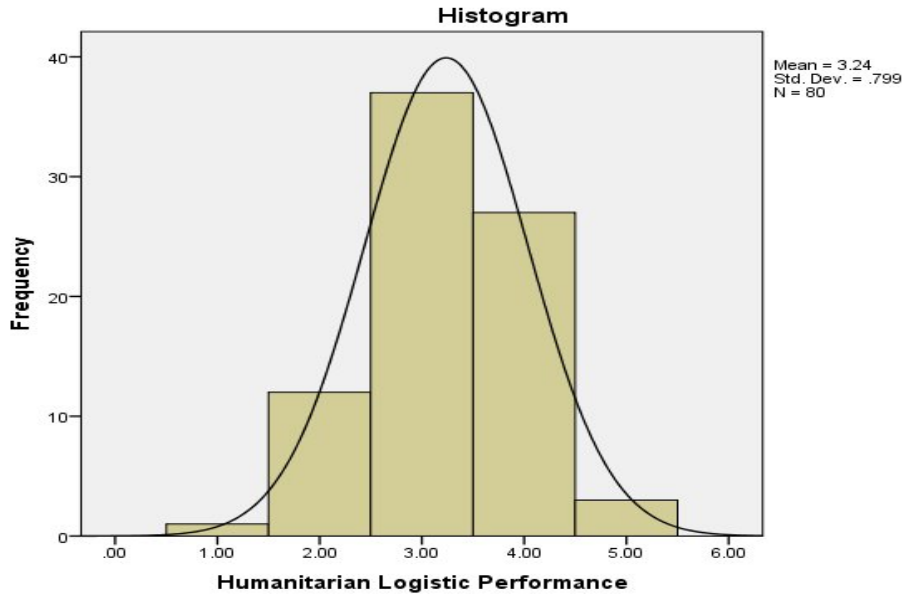


Source: Study Survey, 2023

The above P-Plot graph shows the linearity of the model in explaining the dependent variable. The P-Plot in the graph depicts that the variables have linear relationship. This meets one of the assumptions in the regression model.

The second assumption of regression is normality. The normality is checked and the distribution is normal as shown in the histogram. The curve appears bell-shaped showing that there is normal distribution.

Figure: 4.2 Histogram of Normality Test



Source: Study Survey, 2023

Table: 4.12. Regression Model Summary

The regression was conducted between humanitarian logistics specific factors (independent variables) and humanitarian logistics performance (dependent variable).The results of the regression analysis are presented as follows.

Model Summary [a]									
			Adjusted R	Std. Error of the	Change Statistics				
Model	R	R Square	Square	Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.611[a]	.373	.330	.65418	.080	9.487	1	74	.003
a. Predictors: (Constant), Situational Analysis, Procurement, Transportation, Warehousing, Distribution									
b. Dependent Variable: Humanitarian Logistic Performance									

Source: Study Survey, 2023

The above model summary shows that the value of R is 0.611 which a measure of the correlation between dependent variable and independent variable. This implies that there is a strong positive

relationship between humanitarian logistic practice and performance, while, R square is the square that measures a correlation and indicates the percentage of the variance of logistic practice with logistic performance. Therefore, R square = 0.373 indicates that all the sub-categories under the independent variable explain 37.3% of the humanitarian logistic performance as one part in the dependent variable.

Table: 4.13. ANOVA [a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
5	Regression	18.819	5	3.764	8.795	.000[f]
	Residual	31.668	74	.428		
	Total	50.488	79			

f. Predictors: (Constant), Situational Analysis, Procurement, Transportation, Warehousing, Distribution
Source: Study Survey, 2023

Table 4.13 reviles F- statistic of each independent variables is 8.795, which indicate that the model is over all good fit and significant at P<0.05. Therefore, there is a statistical significant relationship between dependent variable (humanitarian logistic performance) and independent variable (humanitarian logistics practice).

As shown on table: 4.14 below, the Regression Coefficient indicates that situational analysis has a positive and significant effect on humanitarian performance with a B value (B= .198), at 95% confidence level P<0.05. Procurement has a positive and significant effect on humanitarian logistics performance with a B value (B=.312), at 95% confidence level P<0.05. Transportation has a positive and significant effect on humanitarian logistics performance with a B value (B=.177), at 95% confidence level P<0.05. Distribution has a positive and significant effect on humanitarian logistics performance with a B value (B=.487), at 95% confidence level P<0.05. However, warehousing has no significant effect on humanitarian logistics performance of ERCS; this is because beta coefficient is -0.132 with P-value of 0.438 which is greater than (< .05) alpha (α). On other hand, the result obtained from interview has shown that stock-out and poor infrastructures were one of the main challenges of warehousing management in ERCS, which adversely affected the humanitarian logistic performance.

Table: 4.14. Regression Coefficient[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
5	(Constant)	1.615	.319		5.070	.000	.980	2.250		
	Situational Analysis	.166	.113	.198	1.475	.045	.391	.058	.468	2.138
	Procurement	.267	.108	.312	2.475	.016	.052	.482	.534	1.874
	Transportation	.146	.124	.177	1.177	.024	-.101	.394	.375	2.666
	Warehousing	-.111	.143	-.132	-.779	.438	-.396	.173	.295	3.388
	Distribution	.353	.114	.487	3.080	.003	.124	.581	.338	2.954

a. Dependent Variable: Humanitarian Logistic Performance

Source: Study Survey, 2023

4.6. Discussion of Results

The aim of the study was to assess humanitarian logistics practice and its effect on performance in the case of Ethiopian Red Cross Society /ERCS. Specifically, this study was intended to assess practice, identify challenge and determine performance of humanitarian logistics. Based on the specific objectives of the study the results of the study are discussed as follows:

There are five identified practices of humanitarian logistics studied in ERCS. The first one is "situation analysis". The cumulative mean of the situation analysis was well practiced in ERCS with the average grand mean of 3.41. ERCS practiced situational analysis like assessing situation of disaster in terms of the volume, type and urgency of supplies needed (***M=3.59***), assessing demography of displaced population and the size of vulnerable (M= 3.31), assessing the situation in terms of how the supplies will be stored and delivered (M=3.34)) and assessing security of the staff and supplies in the affected area (M=3.39). Comparing to other practiced items, assessing

the situation of the disaster in terms of the volume, type and urgency of supplies needed was extensively practiced by ERCS.

The procurement management function was practiced in such a way that it ensures quick acquisition of supplies (M=2.98), manages in kind donations of goods and procurement of required supplies (M =3.13), maintaining a proper match between the requested supplies of relief items (M=3.44) and making procurement decisions after a disaster occurs (M=3.23). Relative to the other practice items, maintaining a proper match between the requested supplies of relief items and the volume of supplies was extensively practiced by the organization. The cumulative mean for procurement practice indicators was found to be 3.14 which revealed most of the respondents perceived that procurement management was practiced fairly well. This finding also somewhat alike to Wolde's finding of procurement result, which referred as poor procurement performance.

The other practice identified was transportation management where respondents perceived to be practiced fairly well like procurement practice with cumulative mean of 3.25. The main transportation management functions practiced in ERCS were delivering the right product to the right person at the right time (M= ***3.34***), availing necessary modes of transportation for the movements of goods and people (3.13), availing sufficient transport companies (M=3.25) and using various transport optimization models to deliver supplies with the least cost possible (***M = 3.26***). This finding agrees with the research result of Sara (2020).

With 3.21 cumulative mean values, warehouse management, on the other hand, was perceived to be practiced fairly well next to transportation management. Secures sufficient warehouse (M=3.55), accessibility of location (M=.93), ensures damage free warehouse (M=3.18), and applying the right warehousing management system (M =3.16) were the main practiced items reveled in this study. The finding also agrees with the research result of Fuad (2020)

The last identified indicator of the logistics practices was distribution management where respondents perceived it was moderately practiced. The cumulative mean result for distribution management was 3.31, which is the second highest score next to situational analysis. The main practiced items of distribution management were using well established distribution centers (***M =***

3.45), availability of sufficient information (M = 3.26) and effective distribution of goods (M=3.33). In most case, this finding is also similar with the research findings of Sara (2020).

Based on the information obtained through semi-structured interview, the major internal and external challenges faced by the organization were identified. From the internal challenges, *information communication gap* was reported as one of the major factors affecting the information exchanging process particularly with the remote regional branches and workers in disaster affected areas which could hinder the operation of humanitarian responses during emergency response. *Earmarking of Fund* is the other major challenge that affects the performance of humanitarian logistics of ERCS**.** ERCS depend mainly on donors for funding to be able to execute their duties. Existing stiff competition on resource mobilization from community, and limited resource mobilization skills and wait for international donors and government were the main reasons for this challenges. *Stock Out* is also one of the major challenges that ERCS was faced due to difficulty to replace the stock out on tome. The last major challenge was *Coordination and Collaboration* as it needs to be practiced thought the branch offices and other key and strategic stakeholders. In its very nature, these findings of internal and external challenges of humanitarian logistics faced by ERCS are consistence with the findings of Mbohwa (2010), Dessalegn (2018) and Sara (2020) which had been conducted in different time and place within humanitarian organization.

Regarding humanitarian logistics performance, reliability related to humanitarian logistics performance was found to have 3.15 as a cumulative mean. Similar to a research conducted International Medical Corps by Seid (2020) and Wolde (2019), this finding indicate that reliability of humanitarian logistics performance level of ERCS were moderate. Ability to perform logistics tasks as expected (M=3.23), delivers of supplies at the right time, in the right quantity and with the necessary documentation (M=3.25), delivers a damage-free supply (M=29.) and no complaints reported (M=3.23) were the main performed activates assessed by this study.

The second performance criterion was Cost. The cost related to humanitarian logistics performance was also found to have 2.94 as a grand mean. Here the mean indicate that cost related to humanitarian logistics were performed at moderate level. The main performance items

revealed were applying cost management policy & tacking cost cutting measures (M=2.29), reducing total and delivery cost (M=2.68) and systems designed to meet optimum cost (M=2.94). This finding match with the research results of Seid (2020) and Wolde (2019).

The third and the last criterion used to assess performance of humanitarian operation was responsiveness. The cumulative mean (3.27) revealed that the responsiveness of humanitarian logistic performance level in ERCS were moderate, and the main performance items were makes immediate decision at all levels (M =3.26), minimized order fulfillment lead times and optimized inventory levels (M=3.34), meeting and delivering service based on schedule (M=3.3) and ability to disseminate accurate and timely information (M=3.2). Similarly, this finding also similar with the research result of Seid (2020) and Wolde (2019).

Regarding inferential test, the correlation finding revealed that the whole constructs/parameters, except the distribution management, are weakly and positively correlated to humanitarian logistics performance while the distribution management alone resulted in relatively strong and positive correlation with humanitarian logistics performance. This indicates that ERCS has to work more on humanitarian logistics practice for effective and efficient humanitarian logistics performance. The regression result shows that, all the sub-categories under the independent variable explain 37.3% of the HLP as one part in the dependent variable. But the inferential statistics indicates that the influence of addition of warehousing in model four is not statistically significant in the 95% level of confidence. This finding is relatively consistent with the work of Getnet2020), Seid (2020) and Abbdifatah (2010).

CHAPTER FIVE

5. SUMMARY, CONCLUSION, AND RECOMMENDATION

Introduction

This section of the study presents the major summary of the findings, conclusion, and recommendations. The study was aimed at assessing the humanitarian logistics practices and its effect on performance in ERCS. Particularly, this study was intended to assess practice, identify challenge and determine performance of humanitarian logistics. On the base of each specific objective, detail information of the findings and their implications has been discussed entirely on chapter four, hence the summary of findings, conclusion and recommendations are also presented in subsequence manner, as follow.

5.1. Summary of Major Findings

- Regarding the socio-demographic characteristics of respondents, the findings indicates that the majority of the total respondents were male, interns of their age, the majority of respondents classified from 31-35 & 41-46 years old while, the majorities of the respondents were first degree holders. Concerning their role in the organization the most of them were logistic & supply chain officers. The majority of respondents' work experience lies between 6-10 years old.
- The research findings revealed that the cumulative mean of the situation analysis practice was 3.41, which indicate that situation assessment was well practiced by the ERCS. From this, assessment of the situation of the disaster in terms of the volume, type and urgency of supplies needed relatively had the highest mean score of 3.59. The second practice is procurement management. The Cumulative Mean of procurement management practices was 3.14, which indicate that procurement management was weakly practiced by ERCS. However, from this indicator, the procurement practices of maintaining a proper match between the requested supplies of relief items and the volume of supplies were well practiced. The third construct is 'Transport Management'. The grand mean of transportation management practices was 3.25, which indicate that transportation management was moderately practiced by the organization. The use of various transport optimization models

to deliver supplies with the least cost possible and delivers of the right product to the right person at the right time were perceived by the majority of the respondents as moderately implemented logistics practices. Regarding the 'Warehouse management construct', the cumulative mean of warehouse management practices was 3.21, which indicate that warehouse management was moderately practiced by ERCS. As of this criterion, the practice of securing sufficient warehouse to temporarily store supplies during disasters was well practiced. Concerning the last practice which is the 'distribution management', the study revealed that the cumulative mean of distribution management practices was 3.35, which specify that distribution management was practiced at moderate level by the ERCS. However, the practice of using well established distribution centers to ease and timely distribution and minimize cost of operation was well practiced in the organization.

- Reliability is the other criterion used, in this study, to evaluate humanitarian logistics performance. Reliability to humanitarian logistics performance was found to have 3.15 as a cumulative mean. This also indicate that reliability of humanitarian logistics performance level of ERCS were moderate. In this parameter, 40.0 % and 42.5% of respondents tend to remain neutral and agree, respectively, on the issues of damage free supply by ERCS. The second parameter is Cost. The cost related to humanitarian logistics performance was found to have 2.94 cumulative mean which indicate that cost related to humanitarian logistics was performed at moderate level. However, for the second item in the cost indicated more than half of (52.5%) of the respondents agreed that ERCS's logistics service has reduced total and delivery cost due to damage free and correct supplies. Responsiveness is also the third criterion in assessing humanitarian logistics performance. The overall cumulative mean of Responsiveness was 3.27, which revealed that the responsiveness of humanitarian logistic performance level in ERCS was moderate practiced.

- Semi-structured interview was held intensively with Humanitarian supply chain coordinator and Disaster preparedness and response coordinator who are senior management staff and most experienced employee of ERCS. According to the information collected from the respondents, the major internal and external challenges faced by the organization were identified as follow. From the internal challenges, *information communication gap* was

reported as it affecting the information exchanging process particularly with the remote regional branches and workers in disaster affected areas which could hinder the operation of humanitarian responses during emergency response. *Earmarking of Fund* is the other major challenge that affects the performance of humanitarian logistics of ERCS**.** ERCS depend mainly on donors for funding to be able to execute their duties. Existing stiff competition on resource mobilization from community, and limited resource mobilization skills and waiting for international donors and government were the main reasons for this challenges. *Stock Out* is also one of the major challenges that ERCS was faced due to difficulty to replace the stock out on tome. The last major challenge was *Coordination and Collaboration* as it needs to be practiced thought the branch offices and other key and strategic stakeholders.

- From the External challenge**,** *Inflation and increase in the price of fuel* had challenged the work of humanitarian operation. Increase in the price of fuel, shortage of goods in the market, frequent increments of market prices and lack of foreign currency for procuring drugs and other relief items were also the main external challenges that ERCS had faced recently. The other external challenge was *Inefficiency of Transport Companies and Suppliers;* the service and supplies they deliver have sometimes been below the standards and not on time. The main reasons for the low performance of these companies are; limited knowledge and skill in area of humanitarian activity and logistics, shortage of finance, and weak management system. *Deterioration of the relief items;* sometimes the hot or cold climate condition, the topography and structural condition of the roads were affected the emergency relief items in areas of disaster. *Poor Infrastructure* was challenging as the potential warehouses were located in the poorly developed infrastructures or near to the disaster prone areas were identified to have low quality of infrastructure which makes the humanitarian relief operation very challenging. As of the last two years *Poor Safety and Security* in desisted area were very challenging for humanitarian workers and humanitarian aid materials. The last external challenge was *Delay in Custom Clearing Services*; due to bureaucratic work of customs clearing agent and/or other Federal Minster, there was also delays for some purchased or donated items that imported from abroad for humanitarian relief purpose.

- The correlation finding revealed that the whole constructs/parameters, except the distribution management, are weakly and positively correlated to humanitarian logistics performance while the distribution management alone resulted in relatively strong and positive correlation with humanitarian logistics performance. The regression analysis result shows that, all the sub-categories under the independent variable explain 37.3% of the HLP as one part in the dependent variable.

5.2. Conclusion

In line with the objectives, the finding and analysis of the study the following conclusions are drawn as follow:

The humanitarian logistics practice constructs used for this study reveals that only the situational analysis perceived to be practiced better compare to other humanitarian logistics practices which have been performed at moderate level. From humanitarian logistics performance indicators used in this study, the study revealed that all criteria i.e. reliability, cost and responsiveness are performed at moderate level in ERCS.

Regarding challenges that the organization has faced ten major internal and external challenges have been identified. Information communication gap, earmarking of fund, stock-out and challenges related to coordination & collaboration are the main internal challenges while inflation & increase in the price of fuel, inefficiency of transport companies and suppliers, deterioration of the relief items, poor infrastructure, poor safety & security and delay in custom clearing services are the other major challenges that ERCS currently have faced.

Concerning correlation and regression; the inferential result of the study indicates that, there is weak and positive relationship between the dependent and independent variables, except the distribution management which resulted in relatively strong and positive correlation with humanitarian logistics performance. The regression result explains 37.3% of humanitarian supply chain performance.

5.3. Recommendation

ERCS practice in managing the humanitarian logistics functions, like Procurement, Transport, Warehouse and Distribution, are moderate which needs some strategic improvement. Therefore, *procurement management* system has to be improved by reviewing procurement policy, enhancing the capacity of procurement team so as to they able to administer contract properly, analysis of proposals, increase bargaining power, needs analysis and scenario planning and risk assessment. On other hand, the *transport operation* should also be managed properly; contracting potential transport companies and engaging them to give the service through a long term agreement in order to ensure the required transport, train them so as to they understand humanitarian principle and act accordingly, pursue tighter partnerships and collaboration with competent humanitarian organization in order to get potential local transporters for future needs and using various transport optimization models to deliver supplies with the least possible cost. As far as *warehousing practice* concerned, the organization should always strive to ensures damage free and easily accessible warehouse for efficient delivery of goods to the beneficiaries and warehousing management system that makes it easier to receive, store and distribute the goods with minimum time and cost plan should also implemented throughout the main stores and the 'satellite' stores. Finality, regarding the *distribution management*; the organization has to work to improve the distribution system by modernizing the information communication system, establishing distribution centers to ease and timely distribution that minimize cost of operation, ensuring effective distribution of goods by using reliable transportation system and track and controlling relief items in last mile distribution.

In order to Implement Effective and efficient humanitarian logistics performance, the organization has to establish and improve their logistics activities that should be reliable, cost effective and responsive, which will enhance the logistics performance capacity of the organization. Therefore, the organization has to enhance its *reliability* by delivering of right quantity and at the right time with damage free (the right quality) and trying to minimize complaints during execution of the logistics operation. On the same fashion, the organization has to apply *cost management* policy and system to tack cost cutting measures to reduce total cost in its all logistics operations. The *responsiveness* of a humanitarian organization should also be

improved to maximum level as delays in delivery or relief can cost human live. Therefore, the organization has to improve its execution capacity to move relief goods more quickly and effectively, minimize order fulfillment lead times and optimized inventory levels, work on schedule and improve communication system so that the operation can be improved and so dose alleviating human suffering.

The result of this study showed ERCS have faced both internal and External Challenges in practicing humanitarian logistics. Documenting and promoting of best practices can play key role in generating lessons and hence ERCS should collect, document and disseminate its good practice, success stories and lessons learnt on humanitarian activities. The organization should also conduct a regular assessment and measure the humanitarian logistics performance progress to minimize the potential risks and improve the efficiency and effectiveness of the humanitarian operations performance. On the same vein, the limited capacity of branches in terms of fund raising and project implementation should be improved through effective follow up and organizing Practical training. Therefore, the organization has to prepare different training session and experience sharing workshop on resource mobilization and community based project management skills.

The risks which are relating to values, cost, quality, deterioration of goods etc.., that humanitarian logistics pursues are mainly instigated by logistics activities and operations, which encompass forecasting, transport, warehousing and outsourcing, therefore, the humanitarian organization should apply strong risk analysis and risk management mechanisms. The organization should also improve the coordination and collaboration action with its key stakeholders and partners by improving the existing platforms for communication and information sharing, increasing engagement with partners and donors, and developing system for managing information.

The organization should adopt sufficient pre-positioning of relief items stocks in strategic location, especially near disaster-prone areas to prevent stock-out and enhance humanitarian logistics responsiveness and cost efficiency. In the meantime, the government has responsibility to ensure access and security and investing in infrastructure and information technology development to enhance tracking and tracing of relief items as they enter and move through the

logistics process. Government can also facilitate things to subsidize the inflated fuel cost, minimize the bureaucratic customs clearing process and other duty free import issues. Therefore, ERCS has to work closely with the government bodies and let them understand what the organization has faced currently and try to solve the problems cooperatively, as the relief action needs immediate responses.

5.4. Suggestions for Further Research

i. According to inferential result of this study, there were 66.7% of s unexplained variances on humanitarian logistics performance. Hence, this can be potential study area for further study, as it is important to identify the variables that account for this variance.

ii. As most humanitarian logistics operation involves in various risky situations, it will be important to conducts researches on risk and risk management from humanitarian logistics perspectives.

Annex -1

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Annex-2

Questionnaire & Interview Questions

Dear Respondent,

Subject: <u>Request to respond to the study questionnaire</u>

I am Sisay Worku, a student at Addis Ababa University, School of Commerce, and pursuing a degree of Masters of Arts in Logistics and Supply Chain Management. As part of this course requirement, I am expected to carry out a research on "*Assessment of Humanitarian Logistics Practice and its Effect on Performance: the case of Ethiopian Red Cross Society /ERCS/*".

I therefore, kindly request your assistance and cooperation in responding to the questions attached herewith. The information given will be treated with utmost confidentiality and will be used only for the academic purpose.

Thank you in advance for your response and cooperation.

Respectfully,

Sisay Worku

Phone No: +251911725244

E-mail: sisoworku3@gmail.com

Part 1: Socio- Demographic Characteristics of Respondents

Kindly indicate which characteristic best describes your demography by putting a tick mark (√) in the boxes provided.

1. Age range: A) 18-25 ☐ B) 26-30 ☐
   C) 31-35 ☐ D) 36-40 ☐
   E) 41-46 ☐ F) 50 > ☐
2. Gender: A) Male ☐ B) Female ☐
3. Education level: A) Diploma ☐
   B) First Degree ☐
   C) Master's Degree ☐
   D) Other, Specify _____
4. Current position/department/ held in the organization:
   A) Management Staff (Manager, coordinators, Directors) ☐
   B) Disaster preparedness and response (DPR)
   C) disaster risk reduction (DRR)
   D) Logistic & Supply Chain Specialist (team leader, supervisor & senior officer) ☐
   E) Logistic & Supply Chain staff (officer) ☐
   F) Finance Department ☐
   G) Any other, specify _____
5. Years of experience in the organization:
   A) Less than 2 years ☐
   B) 2 – 5 years ☐
   C) 6 –10 years ☐
   D) 11-15 year ☐
   E) More than 15 years ☐

Part 2: Level of Agreement of Respondent on Humanitarian Logistics Practice and its Effect on Performances.

Below are questions related to the Humanitarian Logistics Practices and their effect on performance the case of Ethiopian Red Cross Society/ERCS/. Kindly indicate your level of agreement (only concerning Your Esteemed organization) to the items by putting a tick mark (√) in the boxes provided. A scale of 1-5 is used to respond to the questions where;

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

A. Humanitarian Logistics Practice OF ERCS

Variables	No	Items	Scales				
			1	2	3	4	5
Situational Assessment	1	ERCS used to ***assess the situation*** of the disaster in *terms of the* ***volume, type*** *and* ***urgency*** of supplies needed.					
	2	The demography of ***displaced population and the size of vulnerable*** population are assessed by ERCS.					
	3	ERCS used to assess the situation in the affected area is in terms of ***how*** the ***supplies will be stored and delivered.***					
	4	ERCS ***assess the security*** of the staff /disaster relief teams/ and supplies in the affected area.					
Procurement	1	ERCS's ***procurement policy*** supports quick acquisition of supplies.					
	2	ERCS's procurement department ***effectively manages*** in kind donations of goods and procurement of required supplies.					
	3	ERCS's Maintain a ***proper match between*** the ***requested supplies*** of relief items and the ***volume of supplies***.					
	4	Usually ERCS prefers making procurement ***decisions after a disaster occurs.***					
	1	ERCS delivers the ***right product to the right person*** at the right time					
	2	ERCS always avails ***necessary modes of transportation*** for the movements of supplies and people.					

Transportation	3	There are ***sufficient transport companies*** that provide transportation services for ERCS, during emergency works.					
	4	ERCS uses various ***transport optimization models*** to deliver supplies with the least cost possible.					
Warehousing	1	ERCS secures ***sufficient warehouse*** to temporarily store supplies during disasters.					
	2	***Warehouse location is very accessible*** for delivery of the perfect order in disaster situations.					
	3	ERCS always ensures ***damage free warehouse*** for efficient delivery of goods to the beneficiaries.					
	4	ERCS apply the right warehousing management system that makes it easier to receive, store and distribute the goods with minimum cost plan.					
Distribution	1	ERCS uses ***well established distribution centers*** to ease and timely distribution and minimize cost of operation.					
	2	Distribution team has ***sufficient information as to whom*** the supplies should be delivered.					
	3	ERCS ensures ***effective distribution*** of goods by using reliable transportation system.					

B. Humanitarian Logistics Performance

Variables	**No**	**Items**	**Scales**				
			1	**2**	**3**	**4**	**5**
Reliability	1	ERCS has exhibited a ***strong ability to perform*** logistics tasks as expected.					
	2	ERCS delivers the ***right supplies*** in ***the right quantity*** and at the ***right time*** with all the necessary documentation to meet the requested demands.					
	3	ERCS delivers ***a damage-free supply*** with the correct pattern, hence no return or replacement is required in logistics operation.					

	4	There are ***no complaints*** reported during the execution of the logistics operation in ERCS.					
Cost	1	ERCS applies ***cost management policy*** and usually tack cost cutting measures to reduce total cost in its logistics operations.					
	2	ERCS's logistics service has reduced ***total and delivery cost*** due to damage free and correct supplies.					
	3	ERCS has systems designed to make sure that the ***optimum cost is experienced.***					
Responsiveness	1	ERCS makes ***immediate decision at all levels*** to advance the logistics operations.					
	2	ERCS has minimized ***order fulfillment lead times*** and optimized ***inventory levels***.					
	3	ERCS provides humanitarian logistics as per their ***plan*** *and* ***schedule***.					
	4	ERCS has less capacity to disseminate accurate and timely information due to poor telecommunication infrastructure.					

C. Structured Interview Questions Related to Humanitarian Logistics Challenges (For Management staffs)

1. What are the main challenges of ERCS faced regarding to Logistic Coordination, Information Communication, Human Resource, Earmarking of Fund, Transportation, Infrastructure and Custom Clearing Services?
2. Do you think that ERCS capable of mobilizing sufficient resource/fund for any disaster response operation? Why?
3. What are the main strategies that ERCS use to mobilize resource during disaster?
4. How do you evaluate the coordination and cooperation performance of ERCS with its key stakeholders?

Thank you for completing the survey!

Annex-3

Model Summary [f]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.323[a]	.105	.093	.76129	
2	.484[b]	.234	.214	.70854	
3	.534[c]	.285	.257	.68912	
4	.541[d]	.292	.255	.69020	
5	.611[e]	.373	.330	.65418	2.067

a. Predictors: (Constant), Situational Analysis

b. Predictors: (Constant), Situational Analysis, Procurement

c. Predictors: (Constant), Situational Analysis, Procurement, Transportation

d. Predictors: (Constant), Situational Analysis, Procurement, Transportation, Warehousing

e. Predictors: (Constant), Situational Analysis, Procurement, Transportation, Warehousing, Distribution

f. Dependent Variable: Humanitarian Logistic Performance

Annex-4

ANOVA [a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.281	1	5.281	9.112	.003[b]
	Residual	45.206	78	.580		
	Total	50.488	79			
2	Regression	11.831	2	5.916	11.783	.000[c]
	Residual	38.656	77	.502		
	Total	50.488	79			
3	Regression	14.396	3	4.799	10.104	.000[d]
	Residual	36.092	76	.475		
	Total	50.488	79			
4	Regression	14.759	4	3.690	7.746	.000[e]
	Residual	35.728	75	.476		
	Total	50.488	79			
5	Regression	18.819	5	3.764	8.795	.000[f]
	Residual	31.668	74	.428		
	Total	50.488	79			

a. Dependent Variable: Humanitarian Logistic Performance

b. Predictors: (Constant), Situational Analysis

c. Predictors: (Constant), Situational Analysis, Procurement

d. Predictors: (Constant), Situational Analysis, Procurement, Transportation

e. Predictors: (Constant), Situational Analysis, Procurement, Transportation, Warehousing

f. Predictors: (Constant), Situational Analysis, Procurement, Transportation, Warehousing, Distribution

Annex-5

Excluded Variables [a]

Model		Beta In	T	Sig.	Partial Correlation	Collinearity Statistics		
						Tolerance	VIF	Minimum Tolerance
1	Procurement	.438[b]	3.612	.001	.381	.677	1.477	.677
	Transportation	.463[b]	3.596	.001	.379	.602	1.662	.602
	Warehousing	.389[b]	2.884	.005	.312	.578	1.730	.578
	Distribution	.559[b]	4.389	.000	.447	.572	1.747	.572
2	Transportation	.322[c]	2.324	.023	.258	.490	2.043	.490
	Warehousing	.251[c]	1.816	.073	.204	.504	1.984	.504
	Distribution	.479[c]	3.849	.000	.404	.545	1.833	.497
3	Warehousing	.134[d]	.874	.385	.100	.399	2.506	.388
	Distribution	.424[d]	3.127	.003	.340	.458	2.185	.411
4	Distribution	.487[e]	3.080	.003	.337	.338	2.954	.295

a. Dependent Variable: Humanitarian Logistic Performance

b. Predictors in the Model: (Constant), Situational Analysis

c. Predictors in the Model: (Constant), Situational Analysis, Procurement

d. Predictors in the Model: (Constant), Situational Analysis, Procurement, Transportation

e. Predictors in the Model: (Constant), Situational Analysis, Procurement, Transportation, Warehousing

Annex-6

Collinearity Diagnostics [a]

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions					
				(Constant)	Situational Analysis	Procurement	Transportation	Warehousing	Distribution
1	1	1.965	1.000	.02	.02				
	2	.035	7.512	.98	.98				
2	1	2.932	1.000	.01	.01	.01			
	2	.038	8.766	.95	.09	.37			
	3	.030	9.832	.04	.91	.63			
3	1	3.904	1.000	.00	.00	.00	.00		
	2	.041	9.779	.96	.02	.12	.11		
	3	.030	11.322	.02	.60	.65	.01		
	4	.025	12.599	.02	.37	.23	.88		
4	1	4.878	1.000	.00	.00	.00	.00	.00	
	2	.044	10.553	.91	.01	.01	.06	.09	
	3	.032	12.320	.01	.15	.90	.00	.10	
	4	.027	13.527	.07	.82	.04	.17	.15	
	5	.020	15.803	.00	.02	.05	.76	.66	
5	1	5.842	1.000	.00	.00	.00	.00	.00	.00
	2	.056	10.253	.46	.00	.06	.00	.03	.20
	3	.037	12.594	.43	.01	.59	.04	.00	.08
	4	.027	14.725	.09	.94	.00	.08	.06	.01
	5	.022	16.282	.01	.04	.33	.77	.00	.23
	6	.016	18.860	.01	.01	.02	.11	.90	.48

a. Dependent Variable: Humanitarian Logistic Performance

Residuals Statistics [a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	1.9931	4.0591	3.2375	.48808	80
Residual	-1.35135	1.16249	.00000	.63314	80
Std. Predicted Value	-2.550	1.683	.000	1.000	80
Std. Residual	-2.066	1.777	.000	.968	80

a. Dependent Variable: Humanitarian Logistic Performance

Annex-7

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.290	.325		7.037	.000	1.642	2.937		
	Situational Analysis	.271	.090	.323	3.019	.003	.092	.449	1.000	1.000
2	(Constant)	1.781	.334		5.335	.000	1.116	2.446		
	Situational Analysis	.063	.101	.075	.616	.540	-.140	.265	.677	1.477
	Procurement	.375	.104	.438	3.612	.001	.168	.582	.677	1.477
3	(Constant)	1.610	.333		4.835	.000	.947	2.273		
	Situational Analysis	-.045	.109	-.054	-.415	.679	-.263	.172	.555	1.803
	Procurement	.263	.112	.307	2.346	.022	.040	.486	.551	1.816
	Transportation	.266	.115	.322	2.324	.023	.038	.495	.490	2.043
4	(Constant)	1.576	.336		4.692	.000	.907	2.245		
	Situational Analysis	-.076	.115	-.091	-.665	.508	-.305	.152	.501	1.995
	Procurement	.246	.114	.287	2.166	.033	.020	.473	.536	1.866
	Transportation	.215	.129	.260	1.665	.100	-.042	.472	.388	2.580
	Warehousing	.113	.129	.134	.874	.385	-.145	.371	.399	2.506
5	(Constant)	1.615	.319		5.070	.000	.980	2.250		
	Situational Analysis	.166	.113	.198	1.475	.045	.391	.058	.468	2.138
	Procurement	.267	.108	.312	2.475	.016	.052	.482	.534	1.874
	Transportation	.146	.124	.177	1.177	.024	-.101	.394	.375	2.666
	Warehousing	-.111	.143	-.132	-.779	.438	-.396	.173	.295	3.388
	Distribution	.353	.114	.487	3.080	.003	.124	.581	.338	2.954

a. Dependent Variable: Humanitarian Logistic Performance