# ANALYSIS OF THE HUMANITARIAN LOGISTICS PERFORMANCE: THE CASE OF ETHIOPIAN RED CROSS SOCIETY

**BY**
**Selamawit Gebreyesus**

A THESIS SUBMITTED TO THE ADDIS ABABA UNIVERSITY, COLLEGE OF BUSINESS AND ECONOMICS, SCHOOL OF COMMERCE FOR THE PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTERS OF ART IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

**Advisor: Tariku Jebena (PhD)**

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## Approved by Board of Examiners

**Advisor** **Signature** **Date**

**Internal Examiner** **Signature** **Date**

**External Examiner** **Signature** **Date**

## *Declaration*

I declare that the work which is being presented in this thesis entitled "Analysis of the humanitarian logistics performance, the case of Ethiopian Red cross society" is my original work, has not been presented in any of other university and that all sources of materials used for this thesis have been duly acknowledged.

**Selamawit Gebreyesus**

**REG No: GSD/4690/10**

Signature: _____

Date: _____

# CERTIFICATION

This thesis, entitled *"ANALYSIS OF THE HUMANITARIAN LOGISTICS PERFORMANCE- the case of ERCS"* was carried by **Selamawit Gebreyesus** as a prerequisite to obtain her second degree from Addis Ababa University School of Commerce. She conducted this thesis under my guidance and supervision.

**Advisor:** Tariku Jebena (PhD)

**Signature: _____**

**Date: _____**

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I further wish to express my gratitude to all of the respondents for their cooperation and dedication. Finally my appreciation goes for all humanitarian workers who dedicate their lives for the wellbeing of others.

Selamawit Gebreyesus

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## Abbreviations and Acronyms

**ERCS:** Ethiopian Red Cross Society

**HO**: Humanitarian Organizations

**HSCM**: Humanitarian Supply Chain Management

**SCOR**: Supply Chain Operation Reference

**SCC**: Supply Chain Council

**SPSS**- Statistical Package for Social Science

**WHS**: World Humanitarian Summit

***Abstract***

*The objective of the research study is to analyze the humanitarian logistics performance of Ethiopian Red Cross Society (ERCS). The researcher has used SCOR model to measure the humanitarian logistics performance of ERCS. The study is descriptive and Correlation research. The researcher undertakes a census study in Ethiopian Red Cross Society. The study has used primary data collected through self-administered questionnaire. The self administered questionnaire data are analyzed using mean as a measure of central tendency and inferential statistics. According to the findings of the study, ERCS perform best in responsiveness and the reliability performance attribute needs improvement. In addition to this, the relationships proposed in the framework were tested using Person's correlation. From the result of the analysis it is concluded that there is positive and statistically significant relationship between procurement, warehouse management and humanitarian performance. Nevertheless this study indicates there is positive correlation between transport, distribution management and humanitarian logistics performance, the relationship is very weak. This initiates further research to thoroughly see the significance of the relationship in different humanitarian organization.*

***Key Words: humanitarian logistics performance, SCOR model.***

# CHAPTER ONE
# INTRODUCTION

The purpose of this thesis is to analyze the humanitarian logistics performance of Ethiopian Red Cross Society using SCOR model. The reliability, responsiveness and agility of the case organization were assessed and the possible relationship between humanitarian logistics practice and performance was indicated. Logistics is essential for humanitarian operation and around 80% of the costs for relief operation consist of logistics costs. And hence, effective and efficient logistics performance is required in order to alleviate the suffering of human beings and to save lives. In this introductory chapter of the thesis, the reader will have clear understanding aboutthe research objectives,background of the study, research questions, significance of the study, limitation of the study and organization of the study.

## 1.1. Background of the study

The number of natural and artificial (man-made) disaster has augmented significantly over the past few years. Due to climate change it is expected there will be more disasters (Olortunba, 2005; Dupont and Pearman, 2006); Thomas and Kopczak even expect a steady raise in the number of natural disasters for the next fifty years (Thomas and Kopczak, 2007).

In 2006 the United Nations confirmed the expectation that the natural disasters over the next years become more severe, more often and more destructive (UN, 2006). In 2011, natural disasters killed 30,773 people and caused 244.7 million victims worldwide (Guha-Sapir *et al*., 2012). Economic damages from natural disasters were estimated at US$ 366.1 billion worldwide in 2011 (Guha-Sapir et al., 2012). The increasing number of natural disasters and the resulting humanitarian emergencies put pressure on humanitarian organizations to deliver humanitarian aid in an appropriate and cost effective way (Thomas and Kopzcak, 2005; Van Wassenhove, 2006; Oloruntoba and Gray, 2006; Kovacs and Spens, 2007). Humanitarian organizations (abbreviated as HOs) are faced with logistics complexity, destabilized infrastructure and environment and the HO´s staff works in an extremely chaotic environment (Cassidy, 2003). Logistics is crucial for disaster relief operations because effectiveness and speed in supplying beneficiaries with health services, food, shelter, water, medicines and sanitation is essential in

case of a disaster (Thomas and Kopczak, 2005). Tomasiniand Van Wassenhove (2009) state that around 80% of the costs for relief operations consist of logistics costs in the form of procurement and transportation function.

Nevertheless, the significant increase of natural disasters, complex and cost intensive humanitarian logistics operations, responsibility, and reporting towards donors and beneficiaries but also the financial crisis which is limiting availability of donor money are reasons for HO´s to become more efficient in their operations. For an efficient humanitarian supply chain, performance measurement is crucial. It facilitates effective management and correction by reporting the current level of performance and examining it with the desired level of performance (i.e. the standard) (Melnyk*et al*., 2014).

## 1.2. Background of the case organization

The Ethiopian Red Cross Society (ERCS) was established by government decree on 8 July 1935 in the aftermath of the second Italian aggression over Ethiopia. ERCS began by providing humanitarian services to wounded soldiers and civilian victims. That same year on the 25 September 1935, ERCS was officially recognized as the 48th member of the International Federation of Red Cross and Red Crescent Societies. ERCS is auxiliary to the government and yet it is an independent humanitarian organization. It was established and recognized by law through a National Charter adopted in 31 October 1947. The Charter has undergone various parliamentary revisions, the last being in 1999. The current Charter was endorsed by the Parliament in January 2018.

The Ethiopian Red Cross Society has developed several long-term partnerships with partners from a wide range of backgrounds, including public bodies, other national societies, associations, including businesses, private initiatives and individuals. The Ethiopian Red Cross Society (ERCS) humanitarian diplomacy and communication department work to build the National Society image by raising the knowledge and awareness of the general public on its humanitarian activities for better access, improved knowledge and positive image. The department addresses the National Society strategic objectives to its local and international partners, Sister National Societies, GOs, NGOs, private organizations, volunteers and the public at large. The

humanitarian diplomacy and communication department serves as the spokesperson for the National Society as far as external communication is concerned.

The resource mobilization department coordinates the mobilization of resources to enable ERCS to reach out the most vulnerable groups. It includes preparation of strategic documents, organization of fundraising events and facilitates capacity building programs. One of the oldest and well known Red Cross service by the community is the relief distributions for the people affected by the manmade and natural disaster. Since that the department was established and provides the relief actives based on the resources that mobilized from external sources. However this department change its name and activates based on the government policy and country contexts. In 2014 the department was separated in to two (Disaster preparedness and response (DPR) and disaster risk reduction (DRR)). So the newly established disaster preparedness and response department consisting of three coordinators: Emergency preparedness and response coordinator, emergency health coordinator and restoring family link coordinator.

## 1.3. Statement of the problem

Better, safer and more efficient aid is the stated purpose of the first World Humanitarian Summit (WHS, 2016). With 60 to 80 per cent of humanitarian funding utilized by the supply chain, (Van Wassenhove, 2006), efficiencies must be found here, if the humanitarian organization, are to effectively meet ever increasing need.

Moreover, the significant increase of natural disaster, complex and cost intensive humanitarian logistics operations, responsibility, and reporting toward to donors and beneficiaries are reasons for humanitarian organizations to become more efficient in their operations. For an effective supply chain management in particular humanitarian supply chain management performance measurement and indicators are crucial. Then in practice 55% of humanitarian organization do not monitor and report any performance measurement indicators, 25% declare to control few indicators and 20% measures performance consistently (Blecken 2010). The main target of performance measurement and suitable financial and non-financial indicators is to inform decision makers at all level in producing of high quality goods, processes and services during humanitarian operations relief in case of disaster (Gunasekaran and Kobu 2007, Long 1997).

Even though, researchers have immensely contributed in the field of commercial supply chain performance measurement little is studied on humanitarian logistics performance.

Though there is a limited body of existing knowledge in the area, a recent exception is the research conducted by Davidson (2006); Whitten, G.W., Green Jr, K.W., and Zelbst, P.J. (2012); and Dubey, R., Singh, T., Gupta, O.K. (2015) proposing a performance measurement framework for relief logistics.

Performance measurements for the humanitarian sector have been developed where most frameworks (de Leeuw, 2010; Schulz and Heigh, 2009; Moe et al., 2007) are based on the balance score card introduced by Kaplan& Norton (1992). However, according to Davidson (2006) the balance score card is unfit for the humanitarian logistics performance because it is rigid and too complex to be implemented in the humanitarian context.

Furthermore, humanitarian supply chain/humanitarian logistics performances of nonprofit organizations have not been studied rigorously in Ethiopia. To the best of the researcher knowledge, almost no empirical research prevails regarding HL performance assessment based on SCOR model for non-profit humanitarian organizations in Ethiopia.

Therefore, the researcher's inability to find such studies in this sector is certainly the basic reasons for conducting the present study. In this study, the researcher will try to assess the humanitarian supply chain performance of Ethiopian Red Cross Society (ERCS) using SCOR model.

In the present study, the researcher wants to assess HL performance of ERCS based on an existing HSC performance measurement framework called SCOR model proposed by Bolsche(2013). Accordingly, using SCOR model the humanitarian logistics performance of ERCS was tested empirically and the possible relationship between humanitarian logistics activities& humanitarian logistics performance in ERCS was indicated.

## 1.4. Research Questions

The purpose of this study was to analyze the humanitarian logistics performance of ERCS using SCOR model in relation of reliability, responsiveness and flexibility to the intended beneficiaries. Therefore, to address the basic issues of the research the following basic research questions were answered.

- What are the current practices of humanitarian logistics in ERCS?
- To what extent is the expected performance level of logistics realized in ERCS?
- Is there any relationship between procurement, warehouse, transport and distribution management practices and logistics performance of ERCS?

## 1.5. Research objectives

### 1.5.1. General Objective

The main objective of this study is to analyze the humanitarian logistics performance of the Ethiopian Red Cross Society.

### 1.5.2. Specific Objectives

The specific objectives of this study are:

- To assess the humanitarian logistics practices of the Ethiopian Red Cross Society
- To measure the humanitarian logistics performance of Ethiopian Red Cross Society.
- To determine the relation between humanitarian logistics practice and logistics performance of ERCS.

## 1.6 Significance of the study

Even though performance measurement of humanitarian supply chain is very important to alleviate the suffering of the affected people, limited studies have been taken in this area. The SCOR model which was developed by Supply chain council in 1996 is generic and a quasi-standard model to the description and analysis of supply chains. It comprises a complete set of supply chain performance metrics, industry best practices, and enabling systems. The SCOR model helps to identify the gaps and inefficiencies in processes. The best practices fix the inefficiencies with the leading practices and tools from different successful practices. Though SCOR model can be an adequate instrument for performance measurement in humanitarian supply chain, no study has been taken so far. In this regard, the contribution of this study to the effort of developing the newly emerging performance assessment framework for relief chain sectors and to existing theories will be paramount importance.

The findings of the study were expected to be of immense value to a number of audiences. Humanitarian Organizations operating in Ethiopia would find the study findings relevant in their

understanding of how procurement, transport, warehouse and distribution management practices influence performance measurement in logistics operations and identify areas for improvement.

Meanwhile, in Ethiopia, the study of humanitarian supply chain management has not sufficiently been studied; the output of this study will contribute for the knowledge pool in relation with the functioning and performance of the HSCM in Ethiopia. Additionally, the result of this study is expected to serve as a basis for other studies to be initiated by researchers.

## 1.7 Scope of the study

Supply chain management has a wide scope and includes a lot of theories about how to set up the chain yet, this study will not go through details regarding everything include in the term supply chain management. The aims for this study were analyzing humanitarian logistics performance of ERCS and to study the relationship between HL practices and performance. This study focused on effectiveness of operational performance only (reliability, responsiveness and agility); due time and budget constraint it did not study the financial performance (i.e. cost and asset management cost) of the organization.

## 1.8 Limitation of the study

In view of the limited resources and time available at the disposal of the researcher this particular study specifically covered the humanitarian logistics management practice of ERCS and its logistics performance, who has been implementing emergency and development relief assistance programs in Ethiopia since 1935. Which means the study did not consider other organizations and stakeholders like, donors, host government, other supply chain actors etc.

Besides to this, the study gave an insight with respect to the research questions and objectives specified above and did not meant to address all the issues related to the humanitarian supply chain management operations of ERCS.

## 1.9 Definition of terms

**Humanitarian Logistics:** It is a branch of logistics which specializes in organizing the delivery and warehousing of supplies during natural disasters or complex emergencies to the affected area and people (Christopher,M.G, 1998).

**Humanitarian supply chains:** Mentzer *et al*. (2001) defined humanitarian supply chain as a chain through which services, goods, information, and finance flows between different humanitarian actors in order to provide aid to recipients.

**Humanitarian performance:** According to Bölsche (2013), humanitarian performance is the effective shared performance of a complex system of different humanitarian participants, which works to save lives, alleviate suffering and maintain human dignity both during and in the aftermath of man-made crises and natural disasters, as well working to prevent and strengthen preparedness for the occurrence of such situations. In addition to this effective performance means performing work in ways that are consistent with humanitarian principles, mobilizing and deploying sufficient financial, material and human resources in ways that are relevant, well-managed, accountable, impartial, durable and ensure good quality.

**Performance measurement:** Performance measurement is defined as a process of measuring humanitarian organizations' efficiency and effectiveness in their operation (Neely *et al,* 1995).

**SCOR model:** is generic and a quasi-standard model to the description and analysis of supply chains.

## 1.10 Organization of the study

This study was organized as follows. The first chapter contains background of the study, statement of the problem, basic research questions, objective of the study, definition of terms, significance of the study, scope of the study and limitation of the study. The second chapter related theoretical literature and empirical study on similar or related topics were reviewed and accordingly a conceptual framework was developed. The third chapter describes the methods implemented; it determines data collection and analysis methods and the proposed methodology. Fourth chapter of the study deals with the results revealed and thoroughly discusses the findings of the research. The final chapter, chapter V, is dedicated to the summary, conclusion and recommendation part of the study.

# CHAPTER TWO

# RELATED LITERATURE REVIEW

This chapter briefly introduces and provides a systematic literature review on the works of various scholars in the area of performance of humanitarian logistics in humanitarian organization. It includes definition and theories such as, humanitarian logistics management practices, humanitarian supply chain performance, humanitarian logistics versus business logistics, empirical review related to the topic of the study and conceptual framework. Based on the literature review, this thesis sought to compose and evaluate those research questions and identifies measurement variables which will be used for answering those research questions in order to analyze the humanitarian logistics performance of Ethiopian Red Cross Society (ERCS).

## 2.1. Theoretical Literature Review

### 2.1.1. Humanitarian Logistics

According to Thomas and Kopczack (2005), humanitarian logistics is the process of planning, implementing and controlling effective and cost-efficient movement of goods/services, information, finance and human resources from one point of origin to the other desired location for the purpose of alleviating the suffering of vulnerable people. Situation analysis, planning, procurement, transport, warehousing, tracking and tracing, and customs clearance are considered as the core humanitarian logistics activities.

Humanitarian logistics is characterized by large-scale activities, irregular demand and unusual constraints (Beamon and Kotleba, 2006). The problems can range from a lack of electricity supplies to limited transport infrastructure including 'controlled' environment with some minor variability (e.g. traffic congestion) (Kovacs and Spens, 2009). Humanitarian organizations are mostly driven by donors (i.e. supply) (Tomasini and Van Wassenhove, 2009). The customers (aid recipients) actually have no choice and, therefore, 'true demand' is not created in humanitarian logistics (Kovacs and Spens, 2009).

### 2.1.2. Humanitarian Supply chain

Humanitarian supply chain is a process that integrates, coordinates and controls the movement of materials, goods and related information from suppliers and donors to meet beneficiary requirements in a timely manner. Humanitarian supply chain covers disaster relief as well as continuous support for developing regions. It is the process of getting aid in the form of goods and services to the beneficiaries requiring the goods (Fritz Institute, 2012).

Humanitarian organizations supply chain plays a very crucial role, when providing relief to disaster victims, which involves, planning and management of all activities involved with sourcing, procurement and all logistics management activities, it also includes coordination and collaboration with actors who can be suppliers, intermediaries, donors, beneficiaries, third party service providers, developmental programs and operational activities in times of disaster (CSCMP, 2011).

In addition, HSCM requires the process of effective and cost efficient plans, implementations and controls for aid flows (i.e. materials, goods, services, financial resources, information etc) from the point of origin to the point of consumption with the intention of meeting the aid recipients' requirements ( Thomas and Mizushima, 2005). Now a day, this area attracted the attention of both academics and practitioners (Dubey, 2015). Hence this is the main area of this study focusing analyzing the humanitarian logistics performance of ERCS.

### 2.1.3. Humanitarian logistics vs. Business logistics

A sharp difference exists between the way the logistics is perceived between the business sector and the humanitarians. By comparing humanitarian logistics with business logistics similarities in the basic principles are identifiable. Managing the flow of goods, information and finances from a specific source to the final customer is applicable for both types. In addition, various activities included in commercial logistics such as planning and procurement or transporting and warehousing remain in its ultimate elements also valid for humanitarian logistics. (Kovács& Spens, 2007)

Kovács and Spens (2007) discuss several important differences between business logistics and humanitarian logistics. While business logisticians work with predetermined actors or partners and predictable demand, humanitarians deal with unknown or changing actors and unpredictable demand. Aid agencies receive many unsolicited and sometimes even unwanted donations, such as: drugs and foods past their expiry dates; laptops needing electricity where infrastructure has been destroyed; and heavy clothing not suitable for tropical regions. Compared to their business counterparts, humanitarian logisticians have greater challenges in collaboration and coordination of effort. Coordination of many different aid agencies, suppliers, and local and regional actors, all with their own ways of operating and own structures can be very challenging. Descriptions of relief operations frequently criticize aid agencies for their lack of collaboration, redundancies, and duplicated efforts and materials.

McLachlin, Larson and Khan (2009) offer a framework in which differences between business and humanitarian logistics largely follow from two dimensions: motivation (profit versus not-for-profit) and environment (uninterrupted versus interrupted). In business logistics, actors have the profit motive and generally operate in uninterrupted environments. Interrupted operating environments are rare exceptions. To the contrary, in humanitarian logistics, actors are usually not-for-profit organizations and interrupted environments are the norm, especially in the case of disaster relief as opposed to ongoing development aid operations.

Langley and Rutner (2000) mentioned in their work about commercial logistics that the value of logistics lies in "the contribution to profitability". Therefore, the focus concerning business logistics is on cost reduction while the main purpose for logisticians in the humanitarian context is to ensure aid for people located in crisis regions.

*Table 1 the contrast between business and humanitarian logistics*.

| Topic | Commercial SCM | Humanitarian SCM |
|---|---|---|
| Main objective | Maximize profit | Save lives and help beneficiaries |
| Demand Patter | Fairly stable and can be predicted with forecasting techniques | Irregular with respect to quantity, time and place. Demand is estimated within the first hours of response |
| Supply Pattern | Mostly predictable | Cash is donated for procurement. Unsolicited donations and in- |

| | | |
|---|---|---|
| | | kind donations need sorting, prioritizing to decrease bottlenecks |
| Flow type | Commercial products | Resources like evacuation vehicles, people, shelter, food, hygiene kits, etc. |
| Lead time | Mostly predetermined | Approximately zero lead time, demand is needed immediately |
| Delivery network structure | Established techniques to find the number and locations of warehouses, distribution centers | Ad hoc distribution facilities or demand nodes, dynamic network structure |
| Inventory control | Safety stocks for certain service levels can be found easily when demand and supply pattern is given | Unpredictable demand patter makes inventory control challenging. Prepositioned inventories are usually insufficient |
| Technology and information systems | Highly developed technology is used with commercial software packages | Less technology is used, few software packages that can record and track logistics data. Data network is non-existent |
| Performance measurement method | Based on standard supply chain metrics | Time to respond the disaster, fill rate, percentage of demand supplied fully, meeting donor expectation |
| Equipments and vehicles | Ordinary trucks, vehicles and forklifts | Robust equipment are needed to be mounted and demounted easily |
| Human resources | Commercial SCM is now a respected career path (Thomas, 2003) | High employee-turnover, based on voluntary staff, harsh physical and psychological environment |
| Stakeholders | Shareholders, customers and suppliers | Donors, governments, military, NGOs, beneficiaries, United Nations, etc. |

Source: (Beamon, 2004)

### 2.1.4. Performance Measurement in Humanitarian Logistics

The performance of the humanitarian logistics can have a noteworthy impact on how quickly aid can be moved along the chain, so that it can be distributed to beneficiaries as quickly as possible (Fritz, 2006). During aid operations, there can be lots of different goods that are required at different times and in different places, during the time of the operation. It is important for the

operation that this complexity is well managed. The ultimate goal of supply chain performance measurement is making certain that the right goods are in the right place, at the right time, in the right quantities, in the right quality from the right source.

As said by Neely, Gregory and Platts (1995), performance measurement is the process of quantifying the efficiency and effectiveness of an action using a set of performance metrics. Moreover, Parker (2000) stated that the purpose of measuring organizational performance is (1) to identify success; (2) to identify whether customer requirements are met; (3) to help understand organizational processes; (4) to identify problems, bottlenecks, waste etc.; (5) to ensure decisions are based on facts rather than on supposition or emotion and (6) to show whether planned improvements actually happened.

Performance measurement is particularly important in the humanitarian sector, where limited resources have to be used in the most efficient and effective way (Abidi and Scholten 2015). Furthermore, the increased frequency and severity of natural and manmade disasters, the costs involved in humanitarian supply chain operations as well as the growing competition for scarce resources and donor funding, make performance measurement very important for all humanitarian organizations involved in disaster management (Beamon and Balcik 2008; Santarelli et al. 2013).

According to Poister (2003), effective performance measurement systems can help different humanitarian actors to make better decisions, to improve performance and to provide accountability. Furthermore, performance measures provide feedback on agency performance and help redirect resources more effectively. Performance measurement therefore allows for greater control over operations while increasing flexibility at the operating level (Beamon and Balcik 2008).

Even though, various performance measurement frameworks (e.g. SCOR Model or performance prism) and indicators exist for commercial supply chains, the distinct characteristics of the humanitarian environment cause many of these to be unsuitable or irrelevant (Beamon and Kotleba 2006; Abidi, De Leeuw and Klumpp 2014). However, performance measurement frameworks from the commercial sector are a useful point for the non-profit sector, and thus for the humanitarian organizations (Moxham 2009).

Humanitarian performance is the effective collective performance of a complex system for international, national and locally-based organizations, which works to save lives, alleviate suffering and maintain human dignity both during and in the after effects of man-made crises and natural disaster, as well working to prevent and strengthen preparedness for the occurrence of such situations (Ramalingam and Mitchell, 2009).

In addition Arnold (2008) stated in his study that effective performance means undertaking work in ways that are consistent with humanitarian principles, mobilizing and deploying sufficient financial, material and human resources in ways that are relevant, well-managed, accountable, impartial, and durable and ensure good quality.

In a systematic literature review, Abidi, De Leeuw and Klumpp (2014) evaluate the current state of research on performance management in humanitarian supply chains. They conclude that even though there are a variety of approaches, there is still a long way to go in research on performance measurement in humanitarian supply chains. Only few performance measurement frameworks have been empirically tested and likewise, relatively few humanitarian organizations have contributed to research projects in the field.

Davidson (2006) develops a performance measurement framework for relief logistics for the International Federation of Red Cross and Red Crescent Societies and describes an application of the framework to actual relief operations. The proposed performance measurement framework relies upon four performance attributes i) appeal coverage, ii) donation-to-delivery time, iii) financial efficiency, and iv) assessment accuracy.

The balanced scorecard is the first approach for humanitarian logistics considering different perspectives like the process standpoint, different actors and not only the past but also future expectations about indicators. In addition it tries to identify connections and correlations between the indicators- a requirement which succeeds rarely in the practical application of the balanced scorecard and the influence of indicators on aims and goals, strategy and vision and with this on the impact of humanitarian logistics (Bolsche, 2013).

Performance measurements for the humanitarian sector have been developed where most frameworks (de Leeuw, 2010; Schulz and Heigh, 2009; Moe et al., 2007) are based on the balance score card introduced by Kaplan& Norton (1992). However, due to the rigidness of the

framework and the complexity of humanitarian context, balance score card is unfit for the humanitarian sector (Davidson, 2006).

Even though there is a limited body of existing knowledge in the area, a recent exception is the research conducted by Davidson (2006) ;Whitten *et al*. (2012); and Dubey *et al* (2015) proposing a performance measurement framework of relief logistics.

Several measures have been formulated to gauge supply chain activities and the determination of the appropriate type of gauge is not easy since focusing on one aspect such as cost reduction may improve cost effectiveness at the expense of the performance of the entire supply chain system among others like responsiveness, flexibility, reliability, and customer (beneficiary) satisfaction (Arrowsmith, 2013). Due to this more realistic supply chain model including Supply Chain Operation Reference (SCOR) need to be developed which leads to superior measurement of supply chain performance. The SCOR is perceived as a balanced system of performance measurement since it covers five important processes of the supply chain namely; planning, sourcing, making, delivering and returning (Supply chain Council, 2015).

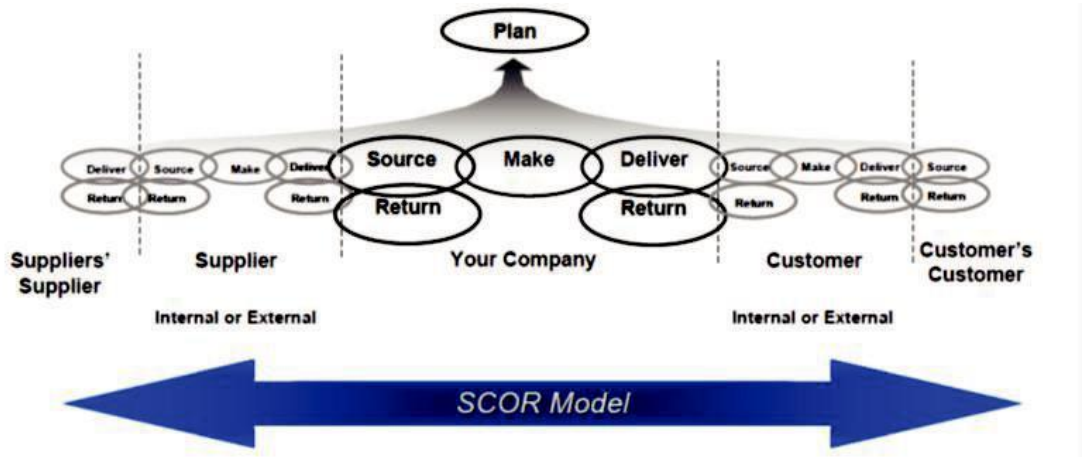


Figure1: Illustration of end-to end supply chain by SCOR (Adopted from SCC, 2015).

As per the SCOR model, five performance attributes should be considered in analyzing the performance of a logistics function in place. These performance attributes are delivery reliability, responsiveness, flexibility, cost and asset management efficiency. Delivery reliability, flexibility and responsiveness performance attributes are those facing towards customers while cost and asset management efficiency focus towards the organization (Supply Chain Council, 2012).

Delivery reliability is about performance of the logistics function in delivering the right product to the right beneficiary at the right time and right quantity. Responsiveness on the other hand emphasizes on the speed at which the logistics function provides products to the beneficiaries. Flexibility is about ability in responding to changing demands in terms of both variety and volume. Cost stands for the costs associated with running the logistics function while asset management efficiency is about efficiency in managing assets so as to satisfy beneficiaries' demand (Thilakarathna, Dharmawardana and Rupasinghe, 2015).

### 2.1.5. Humanitarian logistics management practices

Humanitarian operations should be planned accordingly to get maximum response and minimum loss. Costa *et al*.(2012) identified the following actions that need to be developed for better performance in humanitarian operations: procurement, transport, storage and handling, distribution and performance evaluation.

**a. Procurement**

The recent worldwide devastations have reemphasized the importance of relief supplies that must arrive on time and in adequate quantities for saving lives. Hence, the success of a relief operation depends on effective logistical planning. The purpose of procurement process in the humanitarian supply chains is to ensure that each humanitarian organization (HO) has the essential material resources to meet disastrous situations. Various procurement decisions made by relief organizations can result in considerably different implications in regards to transport, storage and distribution of relief items. These factors ultimately can influence the performance of the humanitarian supply chain and the delivery of the relief items. Blecken and Hellingrath (2008), estimate that procurement activities account for 65 percent of the total expenditures in disaster relief logistics.

Procurement in humanitarian logistics can be done in before or after disaster. Procurement at pre-disaster is necessary for prepositioning relief supplies in strategic locations near disaster prone areas. The beneficiaries are supplied from pre-positioned inventory during the initial days after the disaster. Therefore, having those supplies ready to dispatch is of critical importance.

However, according to Balcik and Beamon (2008), only a small percentage of the total relief supply is sourced from the pre-positioned inventory. When a disaster occurs, a relief organization is interested in procuring a relief item in large amounts and it is not economical to pre-position large amounts of inventory for this item. Thus pre-positioned inventories are usually insufficient in many disaster relief operations. Also, post-disaster procurement is necessary because disasters are unpredictable in nature (Balcik et al. 2010). The location, timing and severity of a disaster are unknown, hence the relief organization prefers making procurement decisions after a disaster occurs. It is worth noting that in addition to using prepositioned inventories and post-disaster procurement auctions, part of relief items' demands can be satisfied via special supply contracts set by some suppliers at pre-disaster and in-kind donations. In the supply contracts, large humanitarian organizations establish long-term agreements with suppliers to supply certain amount of relief goods on demand. Also, the amounts of in-kind donations as another supply source are unpredictable and tend to proliferate after the disaster strikes and needs to be sorted, prioritized, and stored.

### b. Transport Management

Transportation is the element in the logistics that makes it possible for assistance (the arrival of goods from abroad, as the movement of them within the country) to arrive at the site where it is required. When defining the transportation, it is important to take into consideration not only the necessary means and resources to move the supplies, but also to determine what the actual possibilities and alternatives are to deliver assistance. Alternative means, methods, and routes should be considered as a matter of course. Supplies should not just be moved in any way and at any time, but that the challenge is to do so safely and in a timely manner. This requires maybe the use of all the available means. When deciding which means of transport to use, we have to think about two tasks: the needs on the ground (urgency, type of supplies, distance of the

destination, other conditions, as routes, weather, etc.) and feasible forms of transport (available means, cost, accessibility, transmission capacities, etc.) (Van Wassenhove and Samii, 2003). According to Ballou 2004, transportation is the most important single element in logistics cost and it has significant impact on logistics performance of an organization.

### c. Warehouse Management

Warehousing is fundamentally an act of storing goods between the time they are assembled and the time they are handled to the customer. Warehousing commonly depends on human resources and required facilities and equipment costs (Stock &Lambert, 2001). Furthermore, according to Tuzkaya&Onut, 2009, warehouse performance directly affects the whole supply chain performance of a firm or organization. Ineffective warehouse location selection, design or management will threaten the achievement of a humanitarian relief organization and result in loss of many lives and unnecessarily high costs (Pazour&Carlo, 2015).

### d. Distribution

Distribution is the flow of resources from warehouses or medical centers to affected areas. Relief distribution provides relief in the form of food, medicines, shelters and other related relief resources to wounded people. Due to uncertainties in the post-disaster environment, maximum relief distribution can be achieved by efficient planning.

Some uncertainties in post disaster environments are demand variations, link and facility damage and shortages in resources. Better relief distribution is essential for achieving demand satisfaction, reduced unmet demand (unsatisfied demand level), minimum fatality and maximum lifesaving.

The efficient management of inflow and outflow of the relief materials depends on the size of the facility, number of facilities, number and capacity of vehicles. Likewise, quick and efficient distribution process of the relief materials to the affected population depends on the number of vehicles, capacity of vehicles, efficiency of managing relief materials, accessibility to the field warehouse and distribution centre. Therefore, it is clear that these four decisions are sequentially related with each other. As shown above, these factors have not been studied a whole, but individually or by pairs at the most. For an efficient and effective relief distribution these four

decisions (facility location decision, inventory decision, transportation decision and distribution decision) need to be integrated.

In relief distribution, a significant portion of the literature tries to reduce the unmet demand for improving the distribution of relief. Afshar and Haighani (2012) have proposed a mathematical model that controls the flow of several relief commodities in a supply chain from the source till the point they are delivered to the hands of recipients. Some researchers have worked on resource allocation, the resources being vehicles, commodities, or equipment (Holguín-Veras*et al*., (2013), Zhang *et al*., (2012) and Fiedrich *et al*. (2000). Resource allocation involves assigning the resources without consideration for the flow. As demand increases resource allocation becomes more difficult. Initially Brown and Vassilou (1993) proposed a resource allocation model for disasters; later Fiedrich *et al*., (2000) introduced a better disaster allocation model.

## 2.2. Empirical Literature Review

### 2.2.1. Humanitarian logistics practices

Munguti(2010),did a study on supply chain management practices in disaster operation using descriptive study approach and a sample of 27 humanitarian organizations found out that HL practices improved the success of HOs and the study stated the HL practices that can be applied to HOs. The study focused on wide scope of SCM practices.

Likewise Munguti (2010) conducted study on supply chain management practices in 27 humanitarian organizations and reported that humanitarian logistics practices improved the success of HOs.

Another study conducted by Mohamed (2012) revealed the relationship between humanitarian supply chain management practices and performance in HOs in Kenya. The study was based on three objectives: i) establishing supply chain management practice among HOs in Kenya, ii) analyzing the relationship between supply chain practices among HOs in Kenya, iii) identifying the supply chain challenges faced by HOs in Kenya. The study was based on descriptive research design and 28 humanitarian organizations in Kenya were participated in this study. The study findings showed that maintaining a good supplier relationship, effective and efficient internal

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

### 2.2.2. Humanitarian Logistics measures and measurements

O'Neill and Young (1988) state that, owing to the central role of logistics in relief operations, the effectiveness and efficiency of the relief chain are important indicators of relief performance. However, the area of relief chain performance measurement of relief chains has not attracted much attention in the literature.

According to Abidi &Klumpp (2013), measuring supply chain performance in humanitarian setting have been challenging due to the following reasons: 1) difficulty obtaining accurate data, 2) limited information technology, 3) chaotic environment, 4) lack of motivation, 5) potential negative media exposure, 6) humanitarian resource issues, 7) general reluctance, 8) conflict between long-term and short-term goals & 9) lack of internal recognition of the importance of supply chain management.

Bolsche (2013) stated on her study that the previously developed frameworks largely miss the integration of the mentioned indicators into process models of logistics and supply chain management. This is a challenge for further research on performance measurement in process-oriented humanitarian logistics.

Furthermore, Qing et al. (2016) on their study demonstrated how the Supply Chain Operations Reference (SCOR) framework and its associated performance attributes can be adapted to the humanitarian supply chain. They are able to map the generic supply chain processes of humanitarian organizations and develop a set of twenty-four KPIs for HOs to measure and control their supply chain performances effectively. These metrics measure their performances in

terms of agility, responsiveness, reliability, and cost effectiveness along the whole supply chain processes.

## 2.3 Conceptual Framework of the Study

Even though there are number of conceptual frameworks and discussions on performance measurement systems in the supply chain, there are gaps in supporting the frameworks with an empirical and case studies in (Gunasakaran *et al*., 2004). The SCOR model is one of the popular supply chain framework used to measure the performance of the organization. The model has been used in different continents and business sectors. There are thousands of organizations which implement SCOR model. Adopting SCOR model in organizations helps to solve the five top supply chain challenges (SCC, V.10). These are achieving superior customer service, controlling cost, planning and risk management, supplier/ partner relationship management and talent acquisition.

The study would seek to establish how adoption of the independent variables, the procurement, warehouse, transport and distribution management practices can lead to realization of the dependent variables, logistics performance

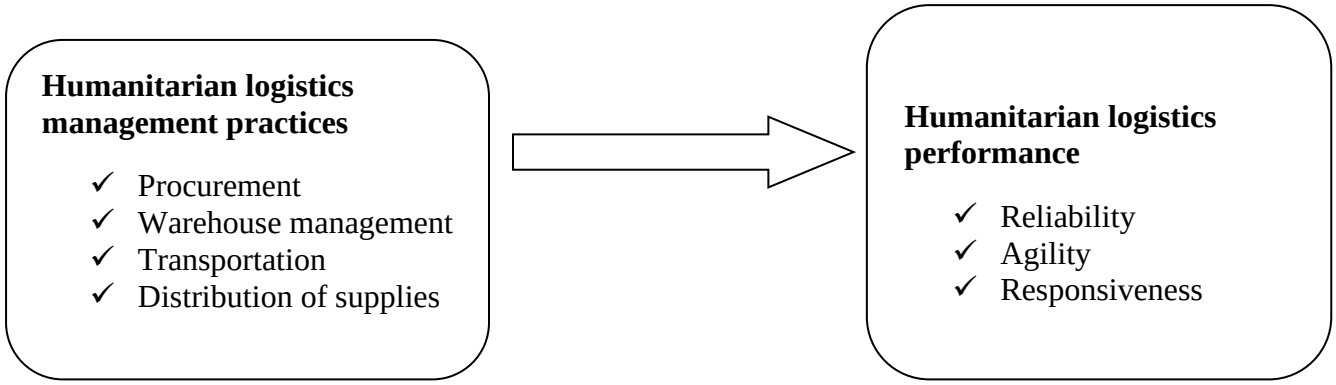


Figure-2 Conceptual Framework of the Study

# CHAPTER THREE

# METHOD OF THE STUDY

This chapter describes the methodologies that were used in this study: It includes, the choice of particular research designs, data type and source of data, research approach, data gathering technique and instruments, sampling and sampling techniques, data analysis techniques, validity and reliability test of the study along with an appropriate justification associated with each approach.

## 3.1. Description of the study area

The study was conducted in the Ethiopian Red Cross Society (ERCS) which was established by government decree on 8 July 1935 in the aftermath of the second Italian aggression over Ethiopia. ERCS began by providing humanitarian services to wounded soldiers and civilian victims. That same year on the 25 September 1935, ERCS was officially recognized as the 48$^{th}$ member of the International Federation of Red Cross and Red Crescent Societies.

The mission of ERCS is to prevent and alleviate human sufferings through appropriate and timely humanitarian and development interventions contribute to the wellbeing of humankind and prevalence of peace by mobilizing the public and partners in Ethiopia and around the world. Since its establishment, the organization has been implementing emergency, rehabilitation and development programs in Ethiopia. ERCS presently provides humanitarian service in the areas of disaster preparedness and response, disaster risk reduction (community resilience building), essential drug program, capacity development for humanitarian services and humanitarian diplomacy.

ERCS has a structure consisting of 11 regional branches in Addis Ababa, Afar, Amhara, Benishangul-Gumuz, Dire Dawa, Gambella, Oromia, Harai, SNNP, Somalia and Tigray region.

## 3.2. Research Approach

According to Creswell (2005), there are three research methods namely qualitative, quantitative and mixed. One of them is not better than the others so the choice depends on how the researcher wants to do a research.

Quantitative research method is a kind of research involves the use of organized questions where the response options are predictable and a large number of respondents are involved. According to Creswell (2005), quantitative research is a type of educational research in which the researcher decides what to study, asks specific, narrow questions, collects numeric (numbered) data from participants, analyzes these numbers using statistics, and conducts the inquiry in an unbiased, objective manner. Quantitative method is a study involving analysis of data and information that are descriptive in nature and qualified (Sekaran, 2003). Quantitative approach is one in which the investigator primarily uses postpositive claims for developing knowledge (Creswell, 2009). Therefore, in terms of methods, this research employed quantitative method while conducting the study.

## 3.3. Research Design

To analyze the humanitarian logistics performance of ERCS, the researcher found convenient a descriptive and correlation study research design. The performance of the logistics with regard to the three variables of reliability, responsiveness and agility was described and presented. In addition to this the relationship between humanitarian logistics practices namely, procurement, transport management, warehouse management and distribution management, and humanitarian logistics performance was studied.

## 3.4. Population and Sample

Ethiopian Red Cross society was selected for this study because it is the oldest humanitarian organization in Ethiopia and performs significant work related to logistics and supply chain management. Target populations purposively selected are workers of ERCS who work in logistics area and its support system and related services. This study considered census method due to the limited population size of the study. So the sample size included 50 respondents taken

from 70 individuals who work in the specified area for the purpose of this study. Therefore the researcher considered all workers of ERCS as source population and focus was on staffs that have relationship with logistics and its support system as the target population for the study.

## 3.5. Data Sources and Types

There are two types of data in research. These are primary data and secondary data. Gathering of data is also very important task in writing a research thesis. In order to achieve the objective of this research, both primary and secondary sources of data were used.

The research study used cross-sectional primary data which was collected directly from respondents. Based up on the literature reviews in the supply chain management and SCOR model, self-administered questionnaire were prepared. Primary data was collected from the respondents of ERCS and secondary data was collected from different articles.

## 3.6. Data Collection Procedures

In order to analyze the humanitarian logistics performance, in case of ERCS, both primary and secondary sources was used as a supply of data. The primary data was collected from ERCS (both head and field office) by distributing questionnaire. In order to collect the necessary information regarding the study, standardized questionnaire was prepared by adapting the work of Qing (2016), Wolde(2019)&Yaregal (2019).The questionnaire had three sections. The first section dealt with the profile of the respondents and the organization and the second section dealt with the humanitarian logistics practice of ERCS and the third section examined the humanitarian logistics performance of ERCS. The questionnaire design was in the form of Likert scale where respondents were required to indicate their views on a scale of 1 to 5. Accordingly, indicators representing independent variables in research framework were captured using a 5-point Likert scales, ranging from strongly disagree to strongly agree. The secondary data was collected from different articles (extensive article reviews was conducted); books, and documents from the organization database was reviewed to supplement the primary data.

## 3.7. Data Analysis

Prior to data analysis, the questionnaires were checked for completeness; entries were also checked for consistency of data entry. The finding was presented in tables and analyzed through percentage, mean scores and standard deviations. Descriptive statistics and inferential statistics were used to analyze data. An SPSS program was used to support the data analysis for interpretation. These data assisted the study greatly to analyze the humanitarian logistics practice, to see the correlation between HL practices& performance of the humanitarian logistics in ERCS.

## 3.8. Reliability and Validity Test

Kirk & Miller (1986) discusses two different concepts when it comes to the collection of information; Validity and Reliability. No matter which method the researcher decides to use when collecting the information, the researcher always has to decide how valid and reliable it is.

### 3.8.1. Validity Test

Validity is according to Kirk &Miller(1986) the measurements that the authors has taken to make sure that everything is relevant to the context, in other words, make sure that the research is valid. By doing so the research will stay on the subject. The research will strive to minimize incentives that may exist to diverge from the subject and that can harm the validity of the study.

The content validity of this study was verified by the advisor of this research who looks into the appropriateness of questions and the scales of measurement. Peer discussion with other researchers and logisticians was also conducted since it is another way of checking the appropriateness of questions.

### 3.8.2. Reliability Test

Golafshani (2003) defines reliability as the extent to which results of a study are consistent over time and there is an accurate representation of the total population under study.

According to Toke (2012), the aim of reliability analysis is to find the extent to which a measurement procedure produced the same result if the process is repeated over and over again

under the same conditions. The most common technique used in the literature to assess the scales reliability and stability is use of the Chronbach Alpha Statistics. Chronbach Alpha should be above 0.70 to produce a reliable scale and any scale with Chronbach Alpha less than this standard should be eliminated (Sekaran, 2005).

Table-2 below shows that there is "*acceptable*" and "*good*" internal consistency of each variable's parameters used. And the study has the sum of the variables average Cronbach's alpha value of (α = **0.802**) and the reliability test of the study is located on "*good*" range.

*Table-2 Reliability Test of Measurement Instrument*

| Sr.No | Variable | Cronbach's Alpha | (α) reliability ranges |
|---|---|---|---|
| 1 | Procurement | 0.844 | Good |
| 2 | Transport Management | 0.832 | Good |
| 3 | Warehouse Management | 0.760 | Acceptable |
| 4 | Distribution Management | 0.806 | Good |
| 5 | Reliability | 0.911 | Excellent |
| 6 | Responsiveness | 0.720 | Acceptable |
| 7 | Agility | 0.746 | Acceptable |
| | | **0.802** | Good |

Source: Research data, 2020

## 3.9. Ethical considerations

Ethical clearance was obtained from Addis Ababa University School of Commerce. And before data collection; permission was obtained to distribute questionnaire and collect respondents' response from ERCS. The respondents were informed about the purpose and the benefit of the study along with their full right to refuse or completely reject participation in the study. Furthermore, the respondents were told that their response would be kept confidential and their identity was kept confidential.

# CHAPTER FOUR

# DATA ANALYSIS, RESULTAND DISCUSSION

This chapter presents the analysis of the humanitarian logistics performance of Ethiopian Red Cross Society. The researcher has collected the data in the form of five-point Likert scale questionnaire. Out of 52 questionnaire distributed to respondents 50 questionnaire representing 96.15% of the total questionnaires distributed were returned while 2 questionnaires representing 3.85 % of the total questionnaire distributed to the respondents were not returned. According to Mugenda and Mugenda (1999) stipulation, a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent. Therefore, the response rates of this study were sufficient and representative. The quantitative data collected in the form of questionnaire is analyzed using SPPS (Version 20) and discussed in this chapter.

## 4.1. Respondents demographic profile

The demographic characteristics of the respondents of the study are shown in Table-3 below. The proportion of male& female, age, educational background and work experience they have in ERCS were described.

*Table-3.Respondents' demography*

| Characteristics | Category | Frequency | Percent (%) |
|---|---|---|---|
| Sex | Male | 35 | 70.0 |
| | Female | 15 | 30.0 |
| Age | Less than 25 years | 10 | 20.0 |
| | 25-30 years | 21 | 42.0 |
| | 30-40 years | 13 | 26.0 |
| | more than 40 years | 6 | 12.0 |
| Level of education | College Diploma | 18 | 36.0 |
| | BA/BSC degree | 21 | 42.0 |
| | MA/MBA/MSC | 11 | 22.0 |
| | PhD and above | - | 0 |

| | | | |
|---|---|---|---|
| Work experience | Less than 2 yrs | 10 | 20.0 |
| | 2-5 yrs | 16 | 32.0 |
| | 5-10 yrs | 18 | 36.0 |
| | More than 10 yrs | 6 | 12.0 |

Source: Research data, 2020

According to table-3 most of respondents' age is found in category from 26 to 30&31& 40 with percentage of 42.0 & 26.0 respectively. The level of education of the study for BA/BSC degree is 42.0% and for MA/MBA/MSC degree is 22% with total of 64percentages.From this result one can easily infers that most of the respondents were qualified professionals and they can easily understand and provide their opinion on research questionnaire.

Table-3 above also indicates that 36.0percentage of the respondent's work experience is from 5-10yrs followed by 32.0 percent with 2 to 5 years work experience and 20.0&12.0percent from less than 2 years and above 10 years respectively. This illustrates that the respondents were highly experienced owing to the many years they had worked in the organization.

## 4.2. Humanitarian logistics practice of Ethiopian Red Cross Society

In line with the objectives stated under section 1.5 here effort was made to describe respondents' view on their organizational humanitarian logistics practices. Accordingly primary data were collected about humanitarian logistics practices of Ethiopian Red Cross Society under four broader categories namely, i) Procurement, ii) transport management, iii)warehouse management and iv) distribution management. Based on this, respondent's gauge their response using five point Likert scale. The result of this finding is presented as follow;

### 4.2.1. The procurement practice

As indicated in the table-4 below the descriptive statistics result of the SPSS analysis for the research findings revealed that the overall mean of procurement practice in ERCS is 4.217 and standard deviation of 0.7191.

*Table-4 the procurement practice of ERCS*

| | | SD | D | N | A | SA | Mean | Sta. Dev |
|---|---|---|---|---|---|---|---|---|
| **Procurement** | ERCS's procurement policy favors prompt procurement of supplies. | 0 | 0 | 5 | 21 | 24 | 4.380 | 0.6667 |
| | ERCS's procurement department manages properly the donated goods and the procurement of the supplies needed. | 0 | 0 | 6 | 25 | 19 | 4.260 | 0.6643 |
| | Supplies needed by the evaluation team of ERCS often ensemble supplies procured or donated. | 0 | 1 | 9 | 23 | 17 | 4.120 | 0.7730 |
| | Procurement of supplies corresponds to the type and volume of supplies requested, based on ERCS situation analysis team information. | 0 | 1 | 9 | 23 | 17 | 1.26 | 0.7284 |
| | ERCS procurement team does not delay the availability of the required supplies | 0 | 0 | 10 | 29 | 11 | 4.02 | 0.6543 |
| | In procurement department ERCS has sufficient human resource in order to perform the operation effectively. | 0 | 2 | 6 | 19 | 23 | 4.26 | 0.8283 |
| | | | | | | **Grand Mean** | 4.217 | 0.7191 |

As the table-4 above indicates, the first parameter in the questionnaire was about the procurement policy ERCS applies favor quick acquisition of supplies resulted in mean result of 4.380 and standard deviation 0.6667. The second parameter in the questionnaire was about the ERCS's procurement department properly managing kind donation and procurement supplies resulted in mean result of 4.260 and 0.6643 standard deviation. Supplies that are required by ERCS's assessment team always match with supplies that are procured and/or donated with mean value and standard deviation of 4.120 and 0.7730 respectively. Procurement of supplies match with the requested type and volume of supplies based on the information from the situation analysis team of ERCS with mean value of 4.260 and standard deviation of 0.7284.It is indicated on the questionnaire that ERCS avail the required supplies with no delay with mean

value and standard deviation 4.02 and 0.6543 respectively. Respondents reply with mean value of 4.26 and standard deviation 0.8283 that ERCS's procurement department has sufficient staff.

The findings reveled that as it is compared with the previous study done at Plan international Ethiopia by Wodaje (2019), the procurement practice of ERCS is better than its counterpart humanitarian organization.

### 4.2.2. The Transportation Management Practices

The study also sought to determine the transport management practice of Ethiopian Red Cross Society. The responses were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where 1 mean strongly disagree, 2-disagree, 3-neutral, 4-agree and 5-strongly agree. The mean and standard deviation were generated from SPSS and are as illustrated in Table-5.

As it is shown in table-5 below the transport management practice of ERCS was found to be with overall mean of 4.332 and standard deviation of 0.6696. The first question in the questionnaire was that all mode of transportation are available for the movement of supplies and people in ERCS with mean value and standard deviation of 4.460 and 0.5035 respectively. The second parameter regarding transport management was that third party transport companies are cooperative to ERCS during emergencies to transport supplies and people to the affected area with mean value of 4.460 and standard deviation 0.5789. The third parameter in the questionnaire was relief supplies were delivered to where they are required during emergency with mean value of 4.30 and standard deviation 0.6776. There are sufficient transport companies that provide transportation services for emergency work with ERCS with mean value of 4.300 and standard deviation 0.7071. The final parameter in transportation management was is there a prequalified list of transport companies for ERCS to choose from during emergency and the result found to be with mean value and standard deviation of4.140 and 0.8809, respectively.

*Table-5 Transport management practice of ERCS.*

| | | SD | D | N | A | SA | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|---|
| **Transport Management** | ERCS uses all modes of transport accessible for the movement of supplies and people. | 0 | 0 | 0 | 27 | 23 | 4.460 | 0.5035 |
| | Third party transport companies cooperate with ERCS to transport supplies and people to the affected area during emergency. | 0 | 0 | 2 | 23 | 25 | 4.460 | 0.5789 |
| | ERCS delivers emergency aid supplies to where they are needed. | 0 | 0 | 6 | 23 | 21 | 4.300 | 0.6776 |
| | There are enough transport companies that provide transport services with ERCS for emergency work. | 0 | 1 | 4 | 24 | 21 | 4.300 | 0.7071 |
| | ERCS has a prequalified list of transport companies to choose from during emergencies. | 0 | 2 | 10 | 17 | 21 | 4.140 | 0.8809 |
| | | | | | | **Grand Mean** | 4.332 | 0.6696 |

The result indicates that respondents perceived that transportation management is practiced very well in ERCS.

### 4.2.3. Warehousing Management Practices

From table-6 below one can easily see that majority of the respondents agreed to a very great extent that the firm situated in a manner to improve material distribution operation and has sufficient and appropriate warehouse to temporarily store supplies during disasters with mean value of 4.28 and 4.22 respectively. Respondents also moderately agree that ERCS warehouse location is accessible to distribution with mean value of 4.16 and standard deviation 0.6181.

*Table-6 Warehouse management practice of ERCS.*

Source: research data, 2020

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Warehouse Management** | | SD | D | N | A | SA | Mean | Standard deviation |
| | ERCS has adequate and proper warehouse to temporarily store supplies during disasters. | 0 | 2 | 4 | 25 | 19 | 4.220 | 0.7637 |
| | Location of ERCS warehouse is very accessible for distribution. | 0 | 0 | 6 | 30 | 14 | 4.160 | 0.6181 |
| | The warehouse of ERCS is located in a way that improves the distribution of materials. | 0 | 0 | 7 | 22 | 21 | 4.280 | 0.7010 |
| | | | | | | **Grand Mean** | 4.220 | 0.6942 |

### 4.2.4. The Distribution Management Practices

The study also asked the respondents to give their opinion on how the distribution management practice of ERCS looks. The responses were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where: 1- Not at all, 2- To a little extent, 3- To a moderate extent, 4- To a great extent and 5-To a very great extent. The mean and standard deviations were generated from SPSS and are as illustrated in table below.

*Table-7 the distribution management practices of ERCS*

| | | SD | D | N | A | SA | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|---|
| **Distribution Management** | ERCS's distribution center are well established in order to ease distribution and minimize the cost of operation | 0 | 0 | 3 | 25 | 22 | 4.380 | 0.6024 |
| | The distribution team at ERCS has ample knowledge as to who should deliver the supplies. | 0 | 0 | 6 | 21 | 23 | 4.300 | 0.6884 |
| | The distribution team at ERCS understands clearly the situation is urgent. | 0 | 0 | 9 | 20 | 21 | 4.240 | 0.7440 |
| | ERCS's distribution team is organized in such a way that on the spot situational decisions are encouraged to be made. | 0 | 0 | 12 | 19 | 19 | 4.140 | 0.7827 |
| | ERCS gives appropriate training to the distribution team to ensure that they carry out their duties at higher level of passion and dedication. | 0 | 0 | 2 | 24 | 24 | 4.440 | 0.5771 |
| | | | | | | **Grand Mean** | 4.300 | 0.6789 |

Source: Research data, 2020

From Table 7 above, majority of the respondents agreed to a very great extent that ERCS gives appropriate training to the distribution team to make sure that they execute their duties at higher level of passion and dedication; the firm's distribution center are well established in order to ease distribution and minimize the cost of operation; and ERCS's distribution team has sufficient information as to whom the supplies should be delivered as shown by the mean scores of 4.44, 4.38 and 4.30 respectively. On the other hand, most of the respondents agreed to a moderate extent that the firm's distribution team clearly understand the urgency of the situation and the ERCS's distribution team is organized in such a way that on the spot situational decisions are encouraged to be made as shown by mean value of 4.24 &4.14 respectively. The result implies that the organization should encourage its distribution team to make situational decisions while they distribute the goods to the beneficiaries.

### 4.2.5 Summary of Humanitarian logistics practice of ERCS

There were four identified practices of humanitarian logistics studied in Ethiopian Red Cross Society which was convinced that affect the humanitarian logistics performance of the organization. The procurement function is practiced in such a way that it ensures quick acquisition of supplies and donations of goods as and when needed. The grand mean for procurement practice indicators was found to be 4.217 which revealed most of the respondents perceived that procurement is practiced fairly well. The other practice identified was transportation where respondents perceived to be practiced very well like procurement practice.

The grand mean for transportation was found to be 4.332. With 4.22 grand mean values warehouse management on the other hand was perceived to be practiced fairly well next to transport management. The last identified indicator of the logistics practices was distribution management where respondents perceived it is practiced well. The grand mean result for distribution management was 4.300. In general, among the logistic practices, transport and warehouse management were perceived to be performed better compared to the other humanitarian logistics practices.

The result stated above agrees with the findings of Kiplagat (2017) on supply chain practices and its influence on organizational performance of public universities in Kenya which concluded that 60% of public universities in Kenya had embraced supply chain practices to great extent. It therefore means humanitarian organizations understand that humanitarian logistics practices are very critical in logistics operations because of its ability to enhance efficiency, effectiveness and responsiveness.

## 4.3. Humanitarian logistics performance of ERCS

### 4.3.1. Supply chain reliability of ERCS

The study also sought to determine the supply chain reliability of ERCS. The response were rated on a five point Likert scale indicating to what extent respondents agree to the statements, where 1=strongly disagree, 2=disagree,3=neutral,4= agree and 5=strongly agree. The mean and the standard deviation were generated from SPSS and are as illustrated in Table-8.

In this study nine performance indicators were used to assess the reliability of ERCS. As shown in the table-8 below the overall mean is 4.398 and standard deviation of 0.6613.

*Table-8: Supply chain reliability of ERCS*

| SCOR Code | Statements | Strongly Disagree 1 | Disagree 2 | Neutral 3 | Agree 4 | Strongly agree 5 | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|---|
| **RL.1.1 Perfect Order Fulfillment** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| RL.**2.1 Percentage of orders delivered in full** | | | | | | | | |
| RL.3.33 | ERCS delivers the needed item accurately | 0 | 1 | 4 | 12 | 33 | 4.540 | 0.7343 |
| RL.3.35 | ERCS delivers the needed quantity accurately | 0 | 0 | 4 | 19 | 27 | 4.46 | 0.6456 |
| **RL. Delivery Performance to Beneficiaries Commit Date** | | | | | | | | |
| RL.3.32 | ERCS achieves the commit date to beneficiaries | 0 | 0 | 3 | 24 | 23 | 4.40 | 0.6061 |
| RL.3.34 | ERCS delivers the order to the correct location and beneficiaries | 0 | 1 | 3 | 24 | 22 | 4.340 | 0.6884 |
| **RL.2.3 Documentation Accuracy** | | | | | | | | |
| RL.3.31 | The suppliers complete, correct, and readily available compliance documentations (Material Safety Data Sheet and Certificate of Analysis) accurately | 0 | 0 | 3 | 28 | 19 | 4.320 | 0.5869 |
| RL.3.43 | The suppliers complete, correct, and readily available required documentations (quality certificate) | 0 | 0 | 6 | 20 | 24 | 4.360 | 0.6928 |
| RL.3.50 | The suppliers complete, correct, and readily available shipping documentations (shipment note, bill of loading and packing list) | 0 | 0 | 6 | 19 | 25 | 4.38 | 0.6966 |
| **RL.2.4 Perfect Condition** | | | | | | | | |
| RL.3.24 | ERCS delivers breakage free goods to beneficiaries | 0 | 0 | 5 | 18 | 27 | 4.440 | 0.6749 |
| RL.3.42 | ERCS delivers defect free products/goods. | 0 | 0 | 4 | 25 | 21 | 4.340 | 0.6263 |
| | | | | | | **Grand Mean** | 4.398 | 0.6613 |

Source: research data, 2020

### 4.3.2. Supply chain responsiveness of ERCS

Table-9 below indicates the response of the respondents on the responsiveness of the organization. The overall mean for responsiveness is 4.50 with standard deviation of 0.5622.

*Table-9 Supply chain responsiveness of ERCS*

| **2.2 SUPPLY CHAIN RESPONSIVENESS (RS)** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **SCOR Code** | **Statements** | **Strongly Disagree 1** | **Disagree 2** | **Neutral 3** | **Agree 4** | **Strongly agree 5** | **mean** | **Standard deviation** |
| **RS.2.1 Source Cycle Time** | | | | | | | | |
| RS.3.47<br><br>In stock % | ERCS has enough relief items that are in stock when needed. | 0 | 0 | 2 | 21 | 27 | 4.50 | 0.5803 |
| RS.3.31 External event response(ave. days) | ERCS has short average response time in days to an external risk event from the onset of the event, including detection time)? | 0 | 0 | 1 | 23 | 26 | 4.50 | 0.5440 |
| | | | | | | **Grand Mean** | 4.50 | 0.5622 |

Source: research data, 2020

### 4.3.3 Supply chain agility of ERCS

The first parameter in questionnaire regarding supply chain agility was the number of days required to achieve an unplanned sustainable 100% increase in quantity of supplies is with mean and standard deviation of 4.40 and 0.5440 respectively. Furthermore, the second parameter in the questionnaire was the number of days required to achieve an unplanned sustainable 100% increase in quantity delivered with the assumption of no other constraint is with mean and standard value of 4.50 and 0.5440 respectively. This implies that ERCS is able to respond to external influence and adjust itself well during unplanned changes.

*Table-10 Supply chain agility of ERCS*

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **2.3 SUPPLY CHAIN AGILITY (AG)** | | | | | | | | |
| **AG.1.1 Upside Supply Chain Flexibility** | | | | | | | | |
| AG.2.1 | The number of days required to achieve an unplanned sustainable 100% increase in quantity of supplies | 0 | 0 | 2 | 26 | 22 | 4.40 | 0.5714 |
| AG.2.3 | The number of days required to achieve an unplanned sustainable 100% increase in quantity delivered with the assumption of no other constraint | 0 | 0 | 1 | 23 | 26 | 4.50 | 0.5440 |
| | | | | | | **Grand Mean** | 4.45 | 0.5577 |

Source: research data, 2020

### 4.3.4 Summary of Humanitarian logistics practice of ERCS

According to the SCOR model, five performance attributes should be considered in assessing the performance of a logistics function in place. These performance attributes are reliability, responsiveness, agility, cost and asset management efficiency. Reliability, flexibility and responsiveness attributes are those facing towards customers while cost and asset management efficiency are those facing towards the organization. This study focused on the first three performance attributes that focus toward the beneficiaries, namely, reliability, responsiveness and agility.

Based on the information analyzed, responsiveness was first viewed with a mean result of 4.50 proceeded by agility and reliability with grand mean of 4.45 and 4.40 respectively. This shows that as compared to other indicators, the respondents perceived that the services provided by ERCS are less reliable.

*Table-11 Summary of mean evaluation of humanitarian logistics performance of ERCS*

| | Performance attribute | Mean | Std. deviation | N |
|---|---|---|---|---|
| Humanitarian logistics performance | Reliability | 4.40 | 0.6613 | 50 |
| | Responsiveness | 4.50 | 0.5622 | 50 |
| | Agility | 4.45 | 0.5577 | 50 |

Source: research data, 2020

## 4.4 Correlation analysis

Correlations are the measure of the linear relationship between two or more variables. According to Kothari (2004), a Coefficient of correlation has the value of '*r*' lies between ± 1. Positive values of *r* indicate positive correlation between the two variables, whereas negative values of '*r*' indicate negative correlation. A zero value of '*r*' indicates that there is no association between the two variables.

According to Evan's (1996), the strength of the correlation can be described as, the absolute value of r namely 0.00-0.19 (Very Weak), 0.20-0.39 (Weak), 0.40-0.59 (Moderate), 0.60-0.79 (Strong) and 0.80-1.00 (Very Strong).

In this section, the researcher conducted correlation analysis in the light of each research objectives and research questions developed. The researcher used Karl Pearson's coefficient of correlation (or simple correlation) analysis as it is the most widely used method of measuring the degree of relationship between two or more variables. The relationship between humanitarian logistics activities and HL performance of ERCS was investigated using Pearson's coefficient of correlation analysis. This provided correlation Coefficients which indicated the strength and direction of relationship. The p-value also indicated the probability of this relationship's significance.

Table-12 below shows the respondents' response about the relationship between dependent and independent factors. Based on that, there is significant positive correlation between procurement and logistics performance with correlation coefficient of 0.368 (r=0.368) and significance level is less than 0.001. Therefore, procurement and logistics performance are very weakly and positively correlated.

*Table-12 correlation between humanitarian logistics practices and humanitarian logistics performance*

**Correlations**

| | | Procurement | Transport management | Warehouse management | Distribution management | Logistics performance |
|---|---|---|---|---|---|---|
| Procurement | Pearson Correlation | 1 | .192 | .343* | .265 | .368** |
| | Sig. (2-tailed) | | .182 | .015 | .062 | .009 |
| | N | 50 | 50 | 50 | 50 | 50 |
| Transport management | Pearson Correlation | .192 | 1 | .114 | .103 | .029 |
| | Sig. (2-tailed) | .182 | | .429 | .475 | .839 |
| | N | 50 | 50 | 50 | 50 | 50 |
| Warehouse management | Pearson Correlation | .343* | .114 | 1 | .308* | .503** |
| | Sig. (2-tailed) | .015 | .429 | | .030 | .000 |
| | N | 50 | 50 | 50 | 50 | 50 |
| Distribution management | Pearson Correlation | .265 | .103 | .308* | 1 | .103 |
| | Sig. (2-tailed) | .062 | .475 | .030 | | .477 |
| | N | 50 | 50 | 50 | 50 | 50 |
| Logistics performance | Pearson Correlation | .368** | .029 | .503** | .103 | 1 |
| | Sig. (2-tailed) | .009 | .839 | .000 | .477 | |
| | N | 50 | 50 | 50 | 50 | 50 |

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

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

Source: research data, 2020

Furthermore, there is slight positive correlation between transport management and humanitarian logistics performance with a Pearson correlation coefficient of 0.029 (r=0.029) significance value is less than 0.001. This significance tells that there is very weak relationship between transport management and HLP. In addition to that there is significant correlation between Warehouse management and logistics performance with a Pearson correlation coefficient of 0.503 (r=0. 503) significance value is less than 0.001. This significance tells that there is moderate relationship between warehouse management and logistics performance.

Finally, Table-12 above, shows that there is significant correlation between distribution management and logistics performance with a Pearson correlation coefficient of 0.103 (r=0. 103) significance value is less than 0.001. This significance tells that there is very weak relationship between distribution management and logistics performance.

This result is further supported by the study of Beamon (1999) that humanitarian logistics performance is positively affected by procurement, delivery strategy, supplier location, location of warehouse, transport choice, safety and politics.

# CHAPTER FIVE

# SUMMARY, CONCLUSION ANDRECOMMENDATION

This chapter presents the summary of the findings of humanitarian logistics practices, performance of Ethiopian Red Cross Society and the relationship between the humanitarian logistics practices and performance. The aim of the study was to evaluate the practices, performances of Humanitarian logistics management of Ethiopian Red Cross Society and the relationship between humanitarian logistics practices and performance at ERCS. This chapter also presents the conclusions made from the findings and the recommendations of the researcher based on the findings as well as suggestions for further research.

## 5.1. Summary of Findings

The major findings of the study revealed that there are various humanitarian logistics practices that are practiced in ERCS. Furthermore, this study is aimed to analyze the humanitarian logistics performance of ERCS based on SCOR performance assessment framework proposed by Qing 2016. Specifically, this study is intended to explore and/or test if there is a possible relationship among humanitarian logistics practices and HL performance. Based on the results of the study the summary of major findings is presented as follows.

The first research question was what are the current practices of humanitarian logistics in ERCS and respondents perceived that transportation management is practiced well in ERCS with mean value of 4.33 followed by distribution management (i.e mean value of 4.30). In addition to this, respondents perceived that warehouse management and procurement are practiced in ERCS equally.

The second research question was to what extent is the expected performance level of logistics realized and the study reveled that ERCS's supply chain is more responsive with grand mean of 4.50. The result also showed that ERCS's supply chain is agile enough to respond to unexpected changes that happen. Finally this study indicates that as compared to the above mentioned performance attributes, ERCS's supply chain is less reliable and as a result of this ERCS is recommended improving its reliability.

In addition to the above mentioned research questions, this research tried to study the correlation between humanitarian logistics practices in ERCS and the logistics performance. The study showed that procurement and warehouse management is significantly correlated with humanitarian logistics performance.

## 5.2. Conclusion

- The study reveals that transport and warehouse management perceived to be performed better compare to other humanitarian logistics practices.
- Due to time and money constraint three performance attributes namely reliability, responsiveness and agility of ERCS were studied. The analyzed data indicates that ERCS's supply chain is more responsive to humanitarian needs followed by agility and reliability.
- The correlation analysis shows that procurement and warehouse management significantly and positively correlated with humanitarian logistics performance.

## 5.3. Recommendation

On the basis of the finding and the conclusion reached, the following suggestions are forwarded.

In humanitarian aid activities, delays in delivery or relief can cost lives. Therefore, efficiency in logistics and supply chain is a key factor as it ensures the smooth flow of goods and services in a complex supply chain system. Therefore, disaster relief organizations are trying to move relief goods more quickly and effectively so that victims can be saved. This requires the support of an agile, responsive and reliable humanitarian logistics.

Documentation of previous practices is very important to learn lessons and hence ERCS should document its performances very well. It is also good for the organization to conduct such researches by in house crew, especially by the monitoring and evaluation team, to evaluate their performances progressively. The other significant problem related to the organization's performance is its reliability. The organization should improve its reliability performance attribute in order to provide the right item to the right beneficiaries.

## 5.4. Further Research Directions

Based on the present research limitations, researcher has identified the following for future research directions.

- The present study can further be extended by covering more NGOs and humanitarian supply chain actors (i.e. Transport companies, host government, beneficiary and third party logistics service providers) and the donors.
- Studying the five performance attributes using SCOR model will give complete idea about the case organization's humanitarian logistics performance both internally and externally. This will help to see how the organization is performing from previous time and against other humanitarian organizations.
- Further research is needed to see how transport management and distribution of supplies relate with humanitarian logistics performance.

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# APPENDICE

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

Masters of Arts in Logistics and Supply Chain Management

Title: Analysis of the humanitarian Logistics Performance: the case ERCS

Dear Respondent,

I am undertaking a master's thesis on the title "analysis of the humanitarian logistics performance: the case of ERCS" as a partial fulfillment of requirement for Masters of Arts in Logistics and Supply Chain Management.

I do believe that your response and participation in the survey questionnaire is a great input to the research study. So that, I kindly requests you to participate and answer all the questions.

The purpose of the questionnaire is fully for academic (will not be used for any other purposes). Your responses will be kept confidential and will not be traceable to the individual respondents. Please be informed that it is not necessary to write your name.

Completing the questionnaire will take about 25 minutes. I kindly ask you to spare a few minutes from your busy schedule since your participation is valuable for the success of the study.

Finally, I thank you very much! Your efforts are greatly appreciated!!!

Don't hesitate to contact me as necessary in the addresses.

Selamawit Gebreyesus

Master's Degree Program Candidate

Email: selamye3@gmail.com

## Appendix-A

### Self-administered Questionnaire
### Questionnaire for ERCS Respondents

**SECTION-1: RESPONDANT'S PROFILE**

The following questions are about the respondents profile in the organization. Kindly indicate the appropriate characteristics of the respondent's profile using (√) on the check box.

1. ID of Respondent_____

2. Respondent's Gender

☐ Male ☐ Female

3. Age of Respondent

☐ under 25 years ☐ From 30 to 40 years

☐ From 25 to 30 years ☐ Above 40 years

4. Level of education

☐ College Diploma ☐ MA/MBA/MSc

☐ BA/BSc Degree ☐ PhD and above

5. Respondent's work experience

☐ Below 2 years ☐ 5 - 10 years

☐ 2 - 5 years ☐ More than 10 years

6. Respondent's current position in the company

☐ Logistics Assistant

☐ Supply Chain Manager

☐Logistics Head

☐ Logistics Specialist

☐ Procurement Manager

☐ Transport Manager ☐ Supply Chain Director

☐ Warehouse Manager ☐ Plant Director

☐ Warehouse Supervisor/ Team Leader

☐ Any other, specify_____

Section 2:HUMANITARIAN LOGIGISTICS MANAGEMENT PRACTICE OF ERCS
Below are questions related to the humanitarian logistics practices of Ethiopian Red Cross Society. Kindly indicate your level of agreement 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

| **Variables** | **Item** | **Scale** | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| **Procurement** | ERCS procurement policy favors prompt procurement of supplies. | | | | | |
| | ERCS's procurement department manages properly the donated goods and the procurement of the supplies needed. | | | | | |
| | Supplies needed by the evaluation team of ERCS often ensemble supplies procured or donated. | | | | | |
| | Procurement of supplies corresponds to the type and volume of supplies requested based on ERCS situation analysis team information. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | ERCS procurement team does not delay the availability of the required supplies | | | | | |
| | In the procurement department ERCS has sufficient human resource in order to perform the operation effectively. | | | | | |
| **Transport Management** | ERCS uses all modes of transport accessible for the movement of supplies and people | | | | | |
| | Third party transport companies cooperate with ERCS to transport supplies and people to the affected area during emergency | | | | | |
| | ERCS delivers emergency aid supplies to where they are needed | | | | | |
| | There are enough transport companies that provide transport services with ERCS for emergency work. | | | | | |
| | ERCS has a prequalified list of transport companies to choose from during emergencies | | | | | |
| **Warehouse Management** | ERCS has adequate and proper warehouse to temporarily store supplies during disaster. | | | | | |
| | Location of ERCS warehouse is very accessible for distribution. | | | | | |
| | The warehouse of ERCS is located in a way that improves the distribution of materials. | | | | | |
| **Distribution Management** | ERCS's distribution center are well established in order to ease distribution and minimize the cost of operation | | | | | |
| | The distribution team at ERCS has ample knowledge as to who should deliver the supplies. | | | | | |
| | The distribution team at ERCS understands clearly the situation is urgent | | | | | |
| | ERCS's distribution team is organized in such a way that on the spot situational decisions are encouraged to be made. | | | | | |
| | ERCS gives appropriate training to the distribution team to ensure that they carry out their duties at higher level of passion and dedication. | | | | | |

SECTION 3: PERFORMANCE OF SUPPLY CHAIN MANAGEMENT PRACTICES

The following questions are about how your organization is implementing supply chain activities. Please indicate the level of your agreement or disagreement by tick mark (√) on the number for the following statements based on your experience in your company. The rating is from 1= Strongly Disagree to 5=Strongly Agree, as shown below.

| **2.1 SUPPLY CHAIN RELIABILITY (RL)** | | | | | | |
|---|---|---|---|---|---|---|
| **SCOR Code** | **Statements** | **Strongly Disagree 1** | **Disagree 2** | **Neutral 3** | **Agree** | **Strongly agree** |
| **RL.1.1 Perfect Order Fulfillment** | | | | | | |
| RL.**2.1 Percentage of orders delivered in full** | | | | | | |
| RL.3.33 | ERCS delivers the needed item accurately | | | | | |
| RL.3.35 | ERCS delivers the needed quantity accurately | | | | | |
| **RL. Delivery Performance to Beneficiaries Commit Date** | | | | | | |
| RL.3.32 | ERCS achieves the commit date to beneficiaries | | | | | |
| RL.3.34 | ERCS delivers the order to the correct location and beneficiaries | | | | | |
| **RL.2.3 Documentation Accuracy** | | | | | | |
| RL.3.31 | The suppliers complete, correct, and readily available compliance documentations (Material Safety Data Sheet and Certificate of Analysis) accurately | | | | | |
| RL.3.43 | The suppliers complete, correct, and readily available required documentations (quality certificate) | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| RL.3.50 | The suppliers complete, correct, and readily available shipping documentations (shipment note, bill of loading and packing list) | | | | | |
| **RL.2.4 Perfect Condition** | | | | | | |
| RL.3.24 | ERCS delivers breakage free goods to beneficiaries | | | | | |
| RL.3.42 | ERCS delivers defect free products/goods. | | | | | |

Please indicate the level of your agreement or disagreement by putting tick mark (√ ) on the check box for the following statements based on your experience in your company. The rating is from 1= Very Long to 5=Very Short, as shown below.

| **2.2 SUPPLY CHAIN RESPONSIVENESS (RS)** | | | | | | |
|---|---|---|---|---|---|---|
| **SCOR Code** | **Statements** | **Strongly Disagree 1** | **Disagree 2** | **Neutral 3** | **Agree 4** | **Strongly agree** |
| **RS.2.1 Source Cycle Time** | | | | | | |
| RS.3.47<br><br>In stock % | ERCS has enough relief items that are in stock when needed. | | | | | |
| RS.3.31 External event response(ave. days) | ERCS has short average response time in days to an external risk event from the onset of the event, including detection time)? | | | | | |
| **2.3 SUPPLY CHAIN AGILITY (AG)** | | | | | | |
| **AG.1.1 Upside Supply Chain Flexibility** | | | | | | |
| AG.2.1 | The number of days required to achieve an unplanned sustainable 100% increase in quantity of supplies | | | | | |
| AG.2.3 | The number of days required to achieve an unplanned sustainable | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | 100% increase in quantity delivered with the assumption of no other constraint | | | | | |

***Thank you!***