



**HUMANITARIAN SUPPLY CHAIN PRACTICES AND
FACTORS AFFECTING ITS PERFORMANCE AT
INTERNATIONAL MEDICAL CORPS ETHIOPIA OFFICE**

BY

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DECLARATION

This thesis is to certify that **Netsanet Yirdaw** has carried out this research work on the topic entitled, *‘Humanitarian Supply Chain Practices and Factors Affecting Its Performance at International Medical Corps Ethiopia Office’*. The work is original in nature and is suitable for submission for the award of master degree in Logistics and Supply Chain Management

Netsanet Yirdaw

Signature -----

Date -----

CERTIFICATION

This is to certify that **NetsanetYirdaw** has carried out this thesis on the topic entitled “*Humanitarian Supply Chain Practices and Factors Affecting Its Performance at International Medical Corps Ethiopia Office*” under my supervision. Accordingly, I here assure that her work is appropriate and standard enough to be submitted for partial fulfillment of the requirements for the award of the degree of Master of Arts degree in Logistics and Supply Chain Management.

Shiferaw Mitiku (PhD)

Signature ----- Date -----

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The researcher

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LIST OF ACRONYMS AND ABBREVIATIONS

BGV	Gender Based Violence
GHRP	Global Humanitarian Response Plan
GSC	Global Supply Chain
HSC	Humanitarian Supply Chain
HSCM	Humanitarian Supply Chain Management
IASC	Inter Agency Standing Committee
ICT	Information Communication Technology
IDPs	Internally Displaced Person
IMC	International Medical Corps
IT	Information Technology
LT	Lead Time
NGOs	Non-governmental Organizations
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
Org.	Organization
SC	Supply Chain
SD	Standard Deviation
SPSS	Statistical Package for Social Science
UN	United Nations
UNDP	United Nations Development Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
WFP	World Food Programme
WHO	World Health Organization

ABSTRACT

This study assessed the practices of humanitarian supply chain and identified the factors affecting the humanitarian supply chain practices and performance of International Medical Corps (IMC) – Ethiopia program. The study utilized both explanatory and descriptive research design. The study population comprised of all the 734 employees of the surveyed organisation's sites and 206 self-administered questionnaires were returned properly that was used to collect primary data. Descriptive statistics was computed to describe the characteristics of the variables in the study while correlation and multiple regression analysis were used to establish the nature of the relationships between the independent and dependent variables. The findings indicate that there was a good humanitarian supply chain practice in IMC Ethiopia; among the four practices procurement resulted in greater but unsatisfactory transport practices have been found. Higher humanitarian supply chain performance of IMC Ethiopia was found particularly towards flexibility of humanitarian supply chain performance. The key factors affecting the humanitarian supply chain performance in IMC Ethiopia included top management commitment, availability of adequate staff, adequate use of information technology, adequate institutional learning practice integration, government factors (harmonization), infrastructure and socio-economic situational factors. This study concluded that effective humanitarian supply chain practice needs for higher supply chain performance in humanitarian organizations. This study suggests it needs a Supply chain and logistics conferences to create an efficient and cost-effective flow and storage of goods and materials for the purpose of alleviating the suffering of vulnerable people, came of age during higher level disaster relief effort.

Keywords: Humanitarian Supply Chain, Practices, Performance

CHAPTER ONE

INTRODUCTION

This chapter briefly presents about background of the study, research problem, research objectives and research questions. Moreover, scope of the study, delimitation of the study significance of the study definition of terms and organization of the study is presented.

1.1 Background of the Study

The number of disasters encountered has increased worldwide over recent years and hundreds of millions of people are affected each year. The impact of disasters and the massive scale of recent global relief efforts have brought growing attention to the need for effective and efficient disaster response operations. Amid ongoing humanitarian crises largely fueled by conflict, violence and the effects of climate change, the world battled with a global pandemic. Between March and December, there were more than 82 million COVID-19 cases and nearly 2 million deaths. To address the pandemic's immediate humanitarian consequences and help vulnerable countries respond, the UN issued the Global Humanitarian Response Plan (GHRP) for COVID-19 in March 2020. It was a joint Inter-Agency Standing Committee (IASC) effort, coordinated by OCHA and supported by partners.

Thirty per cent of global COVID-19 cases and 39 per cent of deaths were in GHRP countries in 2020. The GHRP initially requested \$2 billion, but as the pandemic evolved and its consequences reverberated in vulnerable settings, it was updated twice to cover 63 countries and the request significantly increased to \$9.5 billion. By 31 December, donors had generously provided \$3.8 billion through the GHRP. Beyond the pandemic's immediate health impacts, its secondary impacts were particularly grievous in humanitarian settings and reinforced by pandemic-related travel and movement restrictions. Lockdowns, market volatility, supply chain disruptions and labour movement restrictions due to border closures drastically increased food insecurity, plunging more than 270 million people worldwide into acute food insecurity by the year's end. Gender-based violence (GBV) increased sharply as schools and safe spaces were closed and women and girls were trapped with their aggressors during lockdowns. Some

countries recorded a 700 per cent increase in calls to GBV hotlines in the months after the pandemic began. Essential health services for the most vulnerable people were also disrupted due to the pandemic. By December, 35 GHRP countries (56 per cent) had postponed at least one mass-immunization campaign for a vaccine- preventable disease due to COVID-19. Health service disruptions also led to a 30 per cent reduction in the global coverage of essential nutrition services, leaving nearly 7 million additional children at risk of acute malnutrition. School closures saw the loss of an important early intervention opportunity for protection, mental health and psychosocial support, and nutrition programmes. Economic contractions worldwide caused the first increase in extreme poverty since 1998. Between 119 million and 124 million people could fall back into extreme poverty due to the pandemic, with an additional increase of between 24 million and 39 million people in 2021. This potentially brings the number of additional people living in extreme poverty to between 143 million and 163 million. (UNOCHA Annual report,2020)

Thomas and Kopczak (2005) defined Humanitarian aid and disaster relief supply chain management as “sense-and-respond”, and includes a series of activities: planning, preparedness, procurement, transportation, warehousing, tracking, last mile delivery, and customer clearance. They distinguished between two main streams of humanitarian logistics: ‘aid work’ and ‘disaster relief’. ‘Aid work’ mostly focuses on the continuous support of people in need (e.g. development aid). And the term ‘disaster relief’ is usually used for operations that cope with sudden catastrophes (natural or manmade disasters). Similarly, as per the research by Fritz Institute (2010),Tatham & Pettit (2010) they confirmed that initially, the relief organizations are faced with the challenge of acquiring the needed supplies from different donors. Then, at the next level, the success of the relief operation depends on the most productive supply chain management practices being put in place, relative to vital activities such as procurement, warehousing, transportation, and distribution, planning and execution. Consequently, the donor supplies need to be delivered to the affected sites within the shortest possible period of time (Perry,2007).

The performance of the supply chain can have a significant impact on how quickly aid can be moved along the chain, so that it can be distributed to beneficiaries as quickly as possible. It is

also important that the cost of providing aid is controlled, even though the main objective of aid operations is to get aid to people requiring it, this cannot be done without any regard to

the cost of the operation. Money received from donors needs to be spent well and donors may want to see how that money is being spent. Several different barriers that can affect how effective and efficient the supply chain performs. These include understanding the supply chain process, poor infrastructure, poor communication, uncertainty in demand and supply, availability of resources, lack of knowledge and experience, lack of visibility of goods, underestimating the time necessary (Fritz Institute, 2012).

Therefore, the mission of humanitarian supply chain is to get the right materials to the right place at the right time while optimizing a given performance measure for instance minimizing total operating costs and satisfying a given set of constraints. The way supply chains are operated has a massive impact on the speed and quality of the assistance that can be provided. In addition, supply chain activities from purchasing to the last-mile delivery of items account for a very large share of the cost in a disaster relief operation. Any improvement in the way supply chain management provides humanitarian assistance has the potential to deliver a huge positive impact for people affected by disasters (Tomasini and Wassenhove, 2009).

International Medical Corps has been working in Ethiopia since 2003 with humanitarian programs in Nutrition, Primary Health Care, Community Health, Sexual and Reproductive Health, Mental Health and Psychosocial Services (MHPS), Gender-based Violence (GBV), Livelihoods, and Disaster Risk Reduction (DRR), and Water, Sanitation, and Hygiene (WASH). IMC have provided humanitarian assistance to Ethiopian communities, internally displaced persons (IDPs) and refugees in the Afar, Dollo Ado, Gambella, Jigjiga refugee camps and Oromia Region as well.

IMC have offered programs in more than 60 of the worst-affected woredas in eight regions (Afar– Berhale and Assayita Eritrean Refugee camps (WASH, SRH and GBV programs), Amhara, Benishangul-Gumuz (BSG), Gambella -Jewi, Tierkidi, Pugnido I & II, Nguenyiel and Kule South Sudanese refugee Camps (MHPSS, SRH, GBV and Nutrition programs), Oromia-East Hararghe (Gursum, Fedis, Jarso, Kumbi, Chinaksen, MeyuMuluke, Meta, Babile, Medgatola, Melkabelu), West Hararge (Mieso, GumbiBordede, HawiGudina, DaroLebu, Doba ,

Chiro) and Guji Zone (Liben, Saba Boru and GoroDola) , Somali- Dollo Ado (Melkadida, Bokolmayo, Kobe, Hilaweyne, Buramino Refugee camps) and Jijjiga (Awubere&Sheder camps)including Dollo Ado Host Community,Southern Nations Nationalities, and Peoples' Region (SNNPR), and Tigray providing livelihoods, water, nutrition, GBV and healthcare services awareness and support.

The various stages in the movement of supplies from their point of origin to the moment they reach their recipients are a chain made up of interrelated links. In complex emergencies the humanitarian relief supply chain does not necessarily run-in sequence. When disaster strikes there is often insufficient time to plan for resources or properly assess the situation since any delay in getting the people and supplies on the ground could cost lives. However, this also does not mean that some of the links should be disregarded. Emergency response can start with resource mobilization that runs in parallel with planning, assessments and appeals, and can be constantly changing as the situation on the ground changes. What is essential in the humanitarian supply chain is to provide for such changes by organizing a transparent and flexible supply chain structure that can react immediately to these changes as they come.

Even if International Medical Corps contributes its own effort in addressing the existing problems in disaster-prone areas of the country the organization is under pressure to respond to emergencies in organized, timely, efficient, and appropriate manner. Among the many challenges faced by the organization shortage of resources, lack of potential suppliers, insecurity,poor infrastructure, high uncertainty in (demand, supply, timing, location-environment), poor coordination among the multiple players and decision-makers in a humanitarian supply chain, political, cultural, and socioeconomic conditions of the operational areas are the major ones.

1.2 Statement of the Problem

As recently as January 2020, 10.6 million people out of the total population of 115 million in Ethiopia are affected by climate and human-made humanitarian crises. Some 8.4 million people need humanitarian assistance, and from those people, 6.2 million are in acute need, according to the country's 2020 Humanitarian Needs Overview. Most live in Oromia, Somali and Amhara

regions, where the primary drivers of humanitarian need are climate shocks, pest infestations, lack of recovery opportunities, and conflict-related displacement.

Currently, from the figures mentioned above, 6.2 million people face critical problems related to their physical and mental wellbeing, 5 million faces critical living standard problems, almost 7 million are dealing with dire resilience and recovery issues, and roughly 4 million face serious protection problems. When analyzing conditions more in-depth per sector, 2.8 million face agriculture needs, 2.3 million need education, 2.1 million on emergency shelter and non-food items (ES/NFI) needs, 6.4 million on food, 5.9 million on health services, 4.4 million on nutrition, 3.9 million on protection, 2.6 million on child-protection, and over 7 million lacks the safe WASH coverage. (Humanitarian Needs Overview, OCHA, 2020).

Supply chain is the most important element in any aid work and disaster relief effort, and it is the one that makes the difference between a successful and a failed operation. But it is also the most expensive part of any disaster relief: it has been estimated that logistics accounts for about 80 % of the total costs in disaster relief (Wassenhove, 2006).

Thus, proper investment in supply chain in disaster relief provides the main opportunity to develop and implement effective and efficient use of resources in humanitarian operations (Cozzolino, 2012). In addition, a more strategic use of resources allows humanitarian organizations to raise donor trust and long-term commitment by increasingly skeptical benefactors (Scholten et al., 2010). Humanitarian organizations are therefore under greater scrutiny to monitor the impact of aid and the arrangement of their entire operations; they have to prove to donors, who are pledging millions in aid and goods, that they are really reaching the ones in need (Wassenhove V., 2006). Similarly, humanitarian organizations need ways to identify and adapt to emerging supply chain trends. To proactively manage the overall performance of their humanitarian logistics, organizations need to know more than inventory positions, delivery dates, and fill rates. This requires end-to-end visibility into factors that drive supply chain performance such as: cash-to-cash cycle time, overall supply chain cost, or perfect order fulfillment (Oloruntoba and Gray, 2005)

In International Medical Corps the supply chain management flow is starting from developing a procurement plan based on the project activity plan, then identification of procurement need by

the requesting units by assessing beneficiaries need, then procurement of the goods and services by procurement unit , collecting of the items and transportation activities which are done by logistics unit at country office and at field office team to distribute to the final beneficiaries.

According to IMC Strategy guidance (2020) mentioned that the organizations supply chain and supporting functions faces some problems and need key changes; these key areas are long procurement and payment process, Gaps in the procurement planning (that affects procurement execution), In availability of materials and supplies in the market, Climate change – and natural disasters like drought, flood, locust, new epidemics,man-made disasters and poor infrastructure...

The researcher believed that the research area on IMC related with the main or major factors that really is affecting the supply chain performance which could be a key point to the organization while performing a relief or development operation. This research will also be a bridge in gaping the missing literatures as there is clearly only a few research papers that was done in assessing the performance of humanitarian supply chain organization. Hence, at the end of this study the audience will know the assessed version of IMC Ethiopia and will provide a recommendation that the office can use as a recommendation baseline.

1.3 Research Question

The study answered the following research questions:

- How humanitarian supply chain is being practiced in IMC Ethiopia? (in terms of procurement,warehouse,transportationandinformation and communication)
- What is the humanitarian supply chain performance of IMC Ethiopia?
- What are the factors affecting humanitarian supply chain performance in IMC?

1.4 Objectives of the Study

The study achieved the following general and specific objectives:

1.4.1 General Objective

The general objective was to assess the practices, identify the factors affecting the humanitarian supply chain practices and factors affecting its performance of International Medical Corps (IMC) – Ethiopia program.

1.4.2 Specific Objectives

The specific objectives of this study are:

- to assess the humanitarian supply chain practice of IMC Ethiopia (in terms of procurement, warehouse, transportation and information and communication)
- to measure the humanitarian supply chain performance of IMC Ethiopia.
- to determine factors affecting the humanitarian supply chain performance in IMC Ethiopia.

1.5 Significance of the Study

The first benefited from this research is IMC as it will have a clear picture in identifying what is the major humanitarian supply chain practices and factors affecting its performance.

The study was also beneficial to humanitarian organizations, donor agencies, procurement and supply chain professionals and stakeholders involved in humanitarian supply chain project/ program planning and management. Finally the finding will provide humanitarian organizations in Ethiopia to have a yardstick to perform and make the required humanitarian impact in the domain of supply chain.

1.6 Scope of the Study

The research was destined to focus only on supply chain management operation of IMC - Ethiopia Program. Due to the majority of IMC's humanitarian supply chain sourcing is from local markets; this study did not cover the foreign supply chain of the organization. It covers humanitarian supply chain practice and factors affecting its performance at the International Medical Corps from September 2020 to October 2021.

1.7 Limitation of the Study

The fact that the research only carried out at International medical Corps of Ethiopia office not covered all office located worldwide IMC office. The study was also limited conceptually as the research of HSCP and factors affecting its performance. The study was also limited temporarily as the time where this study will be conducted is only for a limited period.

1.8 Definition of terms

- **Logistics:** Lambert *et al.* (1998) define it as “Logistics is that part of the Supply chain process that plans, implements, and controls the efficient, effective flow and storage of goods, services, and related information from the point of origin to the point of consumption to meet customer’s requirements.
- **Supply chain:** A company’s supply chain is defined by Christopher (1998) as “the network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hand of the ultimate customer”.
- **Supply chain management:** Simchi-Levy (2000) defines Supply Chain Management as “a set of approaches utilized to efficiently integrate suppliers, manufactures, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements”.
- **Supply Chain Performance;** Jane.K (2013) defined supply chain performance for a firm as the performance of the various processes included within the firm’s supply chain function (Bolsche, 2013)
- **Disaster:** is a “serious disruption of the functioning of a community or a society involving wide-spread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources”. (United Nations, 2009).
- **Humanitarian aid:** it refers the material and logistic assistance to people in need. It is usually short-term help until the long-term help by government and other institutions replaces it. (Christopher, M.G., 1998)..

- **Humanitarian supply chains:** Mentzer (2001) describe the humanitarian supply chain as the network created through the flow of services, supplies, information and finances between donors, beneficiaries, suppliers, and different units of humanitarian organizations, in order to provide physical aid to beneficiaries (Shepherd & Gunter, 2006).

1.9 Organization of the Study

This study is organized into five chapters. The first chapter is the introductory part of the study which consists of background of the study, statement of the problem, basic research questions, and objective of the study, significance of the study, scope and limitation of the study. The second chapter deals with review of related literature to this study. The third chapter discusses the research methodology. The collected data from the subject of the study carefully analyzed and interpreted under the fourth chapter. The fifth chapter presents summary, conclusions, and recommendations on the findings of the study.

CHAPTER TWO

RELATED LITERATURE REVIEW

2.1 Introduction

This chapter explains systematic related literature review on the works of different scholars in the area of SCM which are practice and factors affecting SC performance in humanitarian organization from theoretical literature to empirical review. It defines concepts such as humanitarian supply chain management, Humanitarian supply chain practice and factors which affecting humanitarian supply chain performance to obtain insights of the discipline, developed conceptual framework. Based on the literature reviewed, this paper sought to compose and evaluate those research questions and identifies measurement variables which use for answering the research questions designed to assess the humanitarian supply chain performance of IMC Ethiopia.

2.2 Theoretical Literature Review

2.2.1 The Humanitarian Supply Chain Management

Supply chain management integrates the design, planning and control of material, information and financial flows along the entire value chain from the raw material stage to the point of final consumption. Thomas and Kopczak (2005) defined humanitarian supply chain management as the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from the point of origin to the point of consumption for the purpose of alleviating the suffering of vulnerable people.

Humanitarian supply chain management includes activities that are primarily directed towards promoting human welfare. Humanitarian organizations engage in two main types of activities: relief activities and development aid activities. Relief activities represent short-term activities focused on providing goods and services to maximize recovery from natural and man-made disasters. Development aid activities, on the other hand, include longer-term activities focused on such goals as reducing poverty and improving education.

Torre (2011) described that the humanitarian supply-chain management (HSCM) involves managing the different interrelated factors important for the effectiveness of the humanitarian operation system such as goods and materials, information, manpower, political authorities, available infrastructure & etc. to minimize the impact of a disaster affected people.

As per Mbohwa (2006) Humanitarian organizations that have an effective SCM system in place benefit from transparency of all phases in the procurement process are fair and accurately documented. This contributes to the establishment of sound and reliable business relations with suppliers; accountability to donors who may require certain rules to be followed when using the money they have provided. Their supply chains must be both fast and agile, responding to sudden disasters.

According to Oloruntoba & Gray (2006) Humanitarian supply chain is the process used by not-for-profit or donor funded organizations to plan, implement, control the efficiency, cost effective flow and storage of goods and materials as well as related material, from the point of origin to the point of consumption for the purpose of alleviating the suffering of the most vulnerable and most at risk people. The humanitarian SCM needs to coordinate and manage disaster supply chain to ensure that humanitarian organizations gain from the benefits of having a supply chain system in place and expected to ensure that even in times of emergency, the organizations receive value for money in procurement of goods and services.

Anthony Njiiru Ngoto (2016) described that in humanitarian actions, delays in delivery or relief can cost lives. Therefore, efficiency and reliability in supply chain is a key success factor, because it ensures the smooth flow of goods and services. To save lives and alleviate suffering, the response to international emergencies must be timely, effective, appropriate, and well organized.

Similar with commercial SCM, NGO supply chains comprises the planning, implementing and controlling process for the efficient, cost-effective flow and storage of goods and materials as well as related information (Thomas and Kopczak, 2005). Despite the hypothetical fit in the translation of commercial SCM to NGO delivery, NGOs have failed to embrace SCM concepts, which has led to calls for greater academic interest and debate (Kovács and Spens, 2007).

2.2.2 Humanitarian Supply Chain Practices

According to (Jiang & Yuan, 2018), emergency supply chain is a very complex dynamic process which consists of many interdependent tasks with complex objectives and constraints. After an occurrence of a disaster, the primary task is collecting and distributing emergency resources to the affected areas, however, several interdependent tasks emerge, such as who holds the emergency resource, where can one get the emergency resource, who delivers the emergency resource to the affected areas, when are transport vehicles available, etc. The major focus areas of the proposed study are the five supply chain practices namely procurement management, warehouse management, and transportation management and information and communication practices.

2.2.2.1 Procurement Management

In times of emergencies, man-made or natural, when communities are vulnerable, prompt response and actions with fast results are needed. The effectiveness of the response to emergencies in meeting the immediate needs of the affected communities, embarking on the path to recovery and reconstruction, and building trust in governing bodies depends directly on the effectiveness of the procurement processes implemented to respond to the urgent needs (Ali , 2015). If donors respond and the appeal is funded, relief supplies are mobilized. Then the supply chain staff attempts to procure the supplies from local sources, and if the relief organization owns a centralized warehouse, the logistician checks available supplies in those warehouses. Anything that cannot be fulfilled locally or from centralized warehouse is procured from global suppliers through competitive bidding. There are usually multiple suppliers supplying a single relief organization for each relief effort (Beamon &Balcik, 2008).

The goal of procurement is to enable orders to be placed and delivered on schedule at a good price. When possible, governments and organizations prefer to buy locally to avoid delay times and try to help the local economy. However, some organizations prefer to use their regular suppliers to guarantee the quality and standardization of their supplies, or to get better prices (Moeiny&Mokhlesi, 2004). Thus, the purpose of the procurement process is to make sure that the organizations involved in relief management have the resources needed to meet identified needs. This in turn requires identifying the sources of those goods and services and the way in which they will be acquired (PAHO, 1999).

The global pre-positioning networks that are developed to respond to multiple disasters types need to have high turnover rates to enable the storage of consumable relief items such as food and water without increasing risks of spoilage. Since time is not a critical issue during advance purchasing, longer delivery lead times from global suppliers are tolerable and organizations have the time to search for the best prices around the world (Duran , 2013).

Moreover, after a disaster occurs, demand for aid supplies will likely change over time; some items are needed immediately at the earliest stages of relief operations, while other items can be safely supplied during later stages. Designing a pre-positioning system that balances the costs against the risks in the relief chain and maximizes the benefits to the affected populations is vital to achieving an effective and efficient disaster response (Beamon &Balcik, 2008). A global humanitarian system would also benefit from a flexible supply base that increases resilience to disruptions. The ability to find alternative suppliers justifies the use of multiple suppliers that are members of the system with shared responsibilities, pre-approved and certified for specific materials, and must participate in humanitarian system tests and activities (Gavidia, 2017).

2.2.2.2 Transportation Management

Transportation and logistics are the major components of the operations of relief or non-relief organizations and improving the efficiency of transportation and logistics systems has potential to significantly expand humanitarian relief services (Dolinskaya, 2011). Immediately after the disaster, humanitarian organizations often face significant problems of transporting large amounts of different commodities including food, clothing, medical supplies, machinery, and personnel from several origins to several destinations inside the disaster area. The

transportation of supplies and relief personnel must be conducted quickly and efficiently to maximize the survival rate of the affected population and minimize cost of operations (Haghani& M. Afshar, 2009).

In most instances, during disasters transportation infrastructures are damaged, resulting in many constraints imposed on last-mile emergency logistics and affecting feasibilities for emergency relief operations (Jiang & Yuan, 2018). Thus, transportation infrastructure is very critical especially for disaster prone areas. Most transportation infrastructure is designed to operate under normal conditions and little attention has been given to unforeseen circumstances. This implies that if a disaster strikes, there will be more extensive damage to infrastructure. A good transportation system is a key to survival and recovery of a disaster hit area (Masaba, 2015)

Transportation is the element in the supply chain 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),

International humanitarian operations may be hindered by administrative additional humanitarian operations may be hindered by administrative and logistical bottlenecks because of poor infrastructure in the aid logistical bottlenecks because of poor infrastructure in the aid--receiving region and receiving region and the multiplicity of agencies and governments (Van Wassenhove and Samii, 2003), and the multiplicity of agencies and governments (Van Wassenhove and Samii, 2003), and are often in conflict often in conflict zones, thus hindering efficient delivery and distribution of relief list zones, thus hindering efficient delivery and distribution of relief cargos to the needy cargos to the needy.

2.2.2.3 Warehouse Management

The role of the supply chain is to deliver the right products, in the correct quantity, to the right customer, at the right place, at the right time, in the right condition and at the right price. Delivering the right product in the right quantity relies on accurate warehouse picking and dispatching activities. Delivering to the right customer at the right place, on time, requires the product to be labeled correctly and loaded onto the right vehicle with sufficient time to meet delivery deadline. The warehouse also has to ensure the product leaves the warehouse clean and damage free. Ensuring the right price requires a cost-efficient operation that delivers value for money. Therefore, the warehouse is crucial in delivering the perfect order (Richards, 2014).

Warehouse location should be accessible in the right direction in the right area, the size of the land should be appropriate. Storage area used for disaster should be close to the center, storage should be provided in accordance with climatic conditions, a separate stock card should be opened for each material and stock code should be given to all the material defined in the content. The warehouse management center should be equipped with a loading and unloading system i.e. barcode, FRID, WMS, etc. infrastructure, camera system and lighting warehouse management information board equipped with a loading and unloading system. Defects should also be identified (Adiguzel, 2019). Definition of points to receive goods in order to objectively define distribution by warehouse and storage in classes or supply kits to facilitate the distribution should be undertaken. It involves storage, handling, screening, shipment and discharge of material rejected. In points with incoming international donations, it is essential to have staff with custom clearance knowledge, in order to avoid congestion at the entry point. It should also qualify staff to work in the area, to reduce errors and avoid the congestion of airports and blocked warehouses (Costaa, 2012).

2.2.2.4 Information and Communication

Information and communication technologies enable humanitarians, affected communities and volunteers to create, collect, share and use more information than ever before. The goal of any humanitarian logistics information system is therefore to help humanitarian logisticians to attain situation awareness, and provide decision support for the supply chain decisions they face. It has three main objectives: assessment: providing an overview of humanitarian needs, the situation on

the ground and monitoring how they evolve; co-ordination of all humanitarian activities to avoid gaps and overlaps; and humanitarian briefs and appeals towards donors (Comes &Walle, 2016). Humanitarian supply chain information systems can improve the flow of information with other units, in a mutually constructive manner, improving the effectiveness of the humanitarian supply chain. Automated manifest system laser cards have been developed by the defense logistics agency to store substantial amounts of information about shipments. In most instances, Radio frequency identification tags are attached to pallets, trucks and large containers to monitor the location of shipments (PAHO, 1999).

Hence, humanitarian supply chain information systems need to be designed to collect timely, correct and relevant information about the disaster: needs, gaps and humanitarian priorities; available resources and funding; state of infrastructures and access conditions: capacities; goods and delivery status; and to identify all actors within the supply chain e.g. suppliers, transport and infrastructure providers and end users (Comes &Walle, 2016). There are many applications to manage disasters such as; GIS: which provides a tool for effective and efficient storage and manipulation of remotely sensed data and other spatial and non-spatial data types for both specific management and policy oriented information. Remote sensing: makes observation of any object from a distance without coming into actual contact. It can gather data much faster than ground based observation and can cover large area. Internet also provides a useful platform for disaster mitigation communications. Electronic communication has provided the most effective and in some instances perhaps the only means of communication with the outside world (Vyas & Desai, 2007).

For correct decision-making at any stage of disasters from prediction to reconstruction and rehabilitation a considerable amount of data and information is necessary. The most important procedures relating to information for disasters are monitoring, recording, processing, sharing, and dissemination (SA & Syed, 2013). Timely and accurate information is critical to disaster. Effectively collecting, compiling, analyzing, and disseminating timely and relevant information is one of the primary challenges for humanitarian information management and exchange activities. When disasters strike, people need food, shelter, blankets, and medicine. But without an effective communications network, supplies are left undelivered, and relief workers are unable to do their jobs thus, communication is essential to save lives. ICT is crucial in

forecasting and building resilient communities better able to respond to humanitarian emergency, when disaster strikes ICTs help to coordinate complex relief mission (Mubarak , 2013). The management of emergency information supports the decision process before, during and after an emergency. The delivery of an adequate and timely response requires an effective and efficient information management process. It is understood that the information may not, under the circumstances, be absolutely accurate, but it must be based on the best data available at the time. This process should also ensure that procedures are established in order to be registered for the future learned lessons (Bastos et al., 2014). Though it is not possible to completely avoid disasters, but the sufferings can be minimized by creating proper awareness of likely disasters and its impact by developing a suitable warning system, disaster preparedness and management through application of IT tools (Vyas & Desai, 2007)

2.2.3 Performance Management in Humanitarian Supply Chain

Now a days performance evaluation has becoming vital since donors increasingly demand accountability, transparency and value for money in return for their sponsorship of humanitarian aid agencies and as they have great interest in knowing how successful an organization is in accomplishing its goals with the resources they have provided (Scholten 2010). So, humanitarian agencies expected to be more professional in their approach in managing their operations to meet these more challenging performance and accountability standards (Thomas and Kopczak, 2005). Therefore, measuring a performance is not only about willingness of the humanitarian organization but also it has become a mandatory for the survival of the organization in the industry.

Kamau (2013) in her research on Humanitarian supply chain management in Kenya, identified the challenges a humanitarian supply chain facing during disaster situation, their effect and the practices that can be adopted to overcome them. As per her study the effects of supply chain challenges on performance were identified as delay in delivery, uncertainty in demand, poor quality and quantity of goods and services delivered.

Jane K. (2013) also described that in humanitarian actions, delays in delivery or relief can cost lives. Therefore, efficiency and reliability in supply chain is a key success factor because it ensures the smooth flow of goods and services. Therefore, to save lives and alleviate suffering,

the response to international emergencies must be timely, effective, appropriate, and well organized and for that they suggested that the humanitarian supply chain performance must be measured in three aspects delivery, reliability, flexibility and responsiveness. Similarly, Magadi Wanner Brian and NoorShale (2017) on their research on Role of humanitarian logistics on supplychain performance in non-governmental organizations in Kenya: a case of acted Kenya they used reliability, flexibility and responsiveness as a performance measurement.

Accordingly, as it can be seen from the different studies discussed in above the researcher understood that a scholars like Magadi Wanner Brian and Dr. Noor Shale (2017), Kamau (2013), Bonney J. (2003) and Jane K., (2013) directly or indirectly commonly used the three SC performance indicators in their researches, reliability, flexibility and responsiveness. Hence, the researcher will take all the indicators identified by Jane K. (2013) which will best suit to assess the supply chain performance of a humanitarian organization and also decided to use them for the development of his conceptual framework. So, let see what they mean in detail;

2.2.3.1 Supply Chain Reliability

Reliability or quality is a key requirement of any supply chain. Measuring the reliability of logistics processes and products is the way to improve these processes. Supply chain reliability refers to the degree to which a supply chain yields consistent performance. Increasing reliability, reducing inventory and preparing for demand are top priorities for supply chain professionals. Supply chain reliability is essential in implementing an operative supply chain management strategy since it enhances productivity and cuts costs. Reliability warrants inventory to be delivered to customers' on-time. On-time, consistent performance is frequently attributed to shipper/carrier collaboration.

2.2.3.2 Supply Chain Flexibility

The supply chain flexibility is defined as the speed in which the supply chain responds to changes in demand and the business environment; this is in order to either create or preserve competitive advantage.

According to Healsip(2004) when applied to humanitarian action, the supply chain needs to be flexible and able to respond quickly to unpredictable events effectively and efficiently.

Flexibility can be rightly regarded as a critical one. Being flexible means having the capability to provide products/services that meet the individual demands of customers. During disasters the supply chain is not as demanding because the internal infrastructure of the affected area is still intact.

2.2.3.3 Supply chain Responsiveness

Supply chain responsiveness includes a supply chain's ability to do respond to wide ranges of quantities demanded, meet short lead times, handle a large variety of products, build highly innovative products, achieve a high service level, and manage supply uncertainty. These capabilities are similar to many of the characteristics of demand and supply that led to high implied uncertainty. The more of these capabilities a supply chain has it is becoming more responsive and however, responsiveness comes at a cost. For example, to respond to a wider range of quantities demanded, capacity must be improved, which increases costs. This increase in cost exposes to the second definition: Supply chain efficiency is the reverse of the cost of making and delivering a product to the customer. Increases in cost lower efficiency. For every strategic choice to increase responsiveness, there are additional costs that lower efficiency (Sunil Chopra and Peter Meindl, 2007).

2.3 Empirical Literature Review

This section is to review and examine empirical research done by different scholars on the humanitarian supply chain practice, factors which affect its performance of a humanitarian organization.

2.3.1 Humanitarian Supply Chain Practice

Adem (2017) researched the practices and challenges of humanitarian supply chain in selected international NGO's in Ethiopia. The result indicates that the strictness of governmental procedures and infrastructural challenges affect logistics effectiveness. The findings also indicates that the needs of the vulnerable groups are clearly known at the time of pre-response or logistics need assessments, thus, it is necessary to conduct situation assessments. Scarcity of

warehouse space and lack of relevant information management systems will affect the process of distributing relief aid at the right time, at the right place and to the right people.

Japhet Baidoo (2018) conducted a study on „“Ensuring the effective and efficient humanitarian logistical service delivery the role of disaster relief organizations in Ghana””. The results indicate that transportation problems, poor communication and delays in custom clearing and logistics procedures, tend to affect the efficacy of humanitarian organizations. Jafero (2016) researched the challenges of humanitarian supply chain management in the case of National Disaster Risk Management Commission. The results revealed that the humanitarian agencies hardly rely on improved technology in managing the supply chain operation. Very limited numbers of software were also in place to use during the disaster response initiatives.

Tafese (2018) assessed the factors affecting the implementation of supply chain management practices in international NGO’s in Ethiopia in the case of World Vision Ethiopia. The study noted that employee’s skills and abilities affect the implementation of supply chain management practices. The study results also showed that inventory forecasting determines implementation of the supply chain practices to great extent. Results from analysis also showed that management support has great effect in determining implementation of supply chain management practices. Research further established that information sharing greatly affects the implementation of supply chain management practices. In relation to information sharing aspects clear mutual expectations has a great effect on supply chain management implementation.

Taye (2019) assessed the humanitarian logistics coordination practice, role and performance of Ethiopian Red Cross Society using regression and correlation analysis to identify the relation of humanitarian logistics performance with organizational relationship, resource sharing and information sharing practices. The finding of the study indicates positive relationship between the performance of humanitarian logistics and organization relationship, resources sharing and information sharing practices. This implies that a unit increase in one of the variables results in corresponding increase in humanitarian logistics performance. The major coordination challenges identified by the researcher include urgency of relief response, limited logistics practices and government assistance and structure.

Wako (2018) researched the humanitarian logistics practices in disaster response operation in the case of Goal Ethiopia. The procurement practice indicates challenges due to; inexperienced procurement staffs, absence of potential supplier in operation area, inadequacy of organization policy and inability to specification preparation on time and effective plan management problem during emergency time to practice procurement. The result of warehouse and distribution practice indicates challenges which were due to lack of use of technology, problems in receiving and inappropriate distribution system as well as inadequacy of warehouse and delay during commodity distribution. The result of transportation practice indicates challenges due to; inefficiency of annual transportation management plan, absence of adequate infrastructure and difficulty of managing rented vehicles. The correlation result indicated a strong and positive relationship between the humanitarian logistics practices and disaster response.

Wodaje (2019) researched the practices, challenges and performances of humanitarian logistics in Plan International Ethiopia. The results revealed that conducting good situational analysis of security, urgency and extent of damage in affected areas before deployment of supplies is mandatory practice in humanitarian logistics. The use of different modes of transportation in order to mobilize supplies and people to where they are required during emergencies are appropriate for disaster response operations. Moreover, the use of prequalified list of transport companies and various transport optimization models to deliver supplies is essential. The study also found out that availing and making accessible sufficient and appropriate warehouse to temporarily store supplies is essential for easier and efficient aid delivery. Furthermore, the finding of the study also revealed that the use of well established distribution centers eases distribution and minimize cost of operation.

Mwanjumwa and Fridah (2015) claimed that there is significant evidence showing that application of information technology has an influence in supply chain efficiency. Furthermore, their study depicted that no other supply chain factor was found to be strongly correlated like information technology does among the variables under study.

2.3.2 Humanitarian Supply Chain Performance

Measuring humanitarian supply chain performance is a key challenge since it is compounded by the difficulty in obtaining accurate data, limited information technology, a chaotic environment,

lesser motivation, potentially negative media exposure, human resource issues, general reluctance, the conflict between long term and short term goals and a lack of internal recognition of the supply chain (Abidi, H., Klumpp, Leeuw S., 2014). Measuring and managing performance is crucial for an efficient and effective humanitarian supply chain (Leeuw & Klumpp, 2014). For instance, performance of the relief chains would be improved through effective performance measurement systems (Beamon & Balcik, 2008). An organization that measures its performance can build and retain knowledge, and rapidly demonstrate systematic and measurable improvements (Whiting & Ostrom, 2009).

2.3.3 Referred and reviewed articles for the selection of the Non-financial performance indicator

TABLE 1 LIST OF MAJOR REFERRED AND REVIEWED ARTICLES

Author and year of published	Title	Identified Performance indicators
Mbohwa (2006)	Identifying Challenges and Collaboration Areas in Humanitarian Logistics: A Southern African Perspective.	- Fast - Agile, - Responding
Aurelie Charles (2010)	defining and assessing the agility of supply chains on humanitarian experience,	- flexibility, - responsiveness and - effectiveness
Magadi Wanner Brian, Dr. Noor Shale	Role of humanitarian logistics on supply chain performance in non-governmental organizations in Kenya: a case of acted Kenya	- Reliability - Flexibility - Responsiveness
Kamau (2013)	Humanitarian supply chain management in Kenya,	- Delay in delivery - Uncertainty in demand - Poor quality and Quantity of goods - Services delivered

Stevenson & spring 2007 Ngonidzahe K. Ngwenya1 and Micheline J.A. Naude1 (2016) ,Holguin--Veraset <i>al.</i> , 2012).	Different articles	- Agility -Flexibility _Responsiveness
Jane K. (2013)	Supply chain performance in humanitarian organizations in Kenya	-Reliability (Quality) - Flexibility -Responsiveness (Time)

Source: Literature Review Result, 2022

2.3.4 Internal Factors affecting HSCM practices

Internal factors are those very endemic to the organization itself and can be affected or intervened or improved (Kunz & Reiner 2012).

They are events that occur within an organization associated with inadequate resources, employee turnover, and lack of contingency plan, poor organizational structure and systems, lack of employee accountability, internal budget constraints and lack of top management support (Thomas, A. S. and Kopczak, L. R., 2005).

2.3.4.1.1 Strategic Planning

Strategic planning dealing with long-term decision needs to be addressed at the highest level of an organization (Pettit and Beresford, 2009). Different from logistics operations in commercial supply chain (which can be planned regularly in advance of demand), logistics decisions in humanitarian aid and disaster relief supply chain have to be made within short time frames (Balcik and Beamon, 2008).

Logistical procedures and activities must be planned before a disaster. Improvised procurement and transportation activities are less effective. A plan comprises what tasks to be done, what part of the organization will be responsible, and how to procure needed resources. They must also incorporate a national or regional plan based on the vulnerabilities of the infrastructure, the logistical support in the area, and governmental emergency response abilities. Anticipation of how crises evolve is not possible, but it is advantageous to have a plan. If proper planning is in place with realistic if-then-else cases, implementation can be less challenging (Koech, 2005).

2.3.4.1.2 Availability of Professional staffs

Human resources play an important part in the success of the relief mission. The scarcity of trained and experience logistics personnel lead to significant organizational reassignments. The local unavailability of logistics staffs enforce organizations to pull logistics people from other programs and disasters. This possibly increase costs and reduces the effectiveness of relief efforts. Further, organizations may have ineffective processes to develop logistics skills in local staff. Limited human resources are the result of high staff turnover and a scarce pool of qualified and readily deployable personnel, whereas capital resources are subject to unpredictable donations that limit the liquidity of managers in the field.

2.3.4.1.3 Adequate use of Information Technology

Gunasekaran and Ngai (2003), says that IT is helpful when wanting to make changes in logistics information. In the typical commercial supply chain framework, three types of flows occur; materials or goods/services, information, and finance. And, this is also the same within humanitarian supply chain management. Due to the bureaucratic structures and overreliance on manual ways of communication Institutions information sharing is inflexible and which has an effect on supply chain management performance because of delay of information from one entity to the other (Carolyne W. Kamau, 2013).

For a supply chain to achieve its maximum level of effectiveness and efficiency information flow throughout the entire chain must be managed in an integrated and holistic manner.

2.3.4.1.4 Institutional Learning Practice

Organizing, analyzing and sharing the lessons learnt within a particular NGO as well as across the NGO community would have a considerable benefit (Tatham & Spens 2011).

According to the research done by Fritz Institute (2005), logistics staff turnover accounts 80% annually and this in turn hindered the ability of international agencies to build and maintain institutional memory and contextual knowledge (Telford & Cosgrove, 2007). Chandes & Pache (2010), described that lack of real career path for field logisticians and the stressful nature of the work of humanitarian logistics are to be blamed for such a huge staff turnover.

The tacit nature of the humanitarian logistics skills and the assignment of field logisticians to other relief operations give birth to lack of institutional learning. As a result, the lesson learned in one relief operation could not be passed on to other logisticians of a given organization (Fritz Institute 2005).

2.3.4.1.5 Supply chain Integration and Collaboration

The research of Autry, Zacharia and Lamb (2008), establish that logistics must be focused on the coordination and collaboration of activities, logistics social responsibility, strategic distribution planning, and technology and information systems. Supply Chain Management objective is to link all the supply chain agents to cooperate within the firm as a way to maximize productivity in the supply chain and deliver the most benefits to all related parties.

A survey by the Procurement and Supply Chain Benchmarking Consortium at Michigan State University demonstrates the effect of successfully integration. The most successful integration efforts have seen costs decrease by 20 percent, quality improve by 30 percent, and time-to-market decrease by 50 percent. (Sunil Chopra and Peter Meindl, 2007).

Collaboration with supply chain partners can often create a much more realistic forecast. Although it takes an investment of time and effort to build the relationships with partners to begin sharing information and creating collaborative forecasts the supply chain benefits of collaboration are always an order of magnitude greater than the cost. The reality today, however, is that most forecasts do not even account for all the information available across the different functions of a firm. Improvement needs to be made before all supply chain information is accounted for and applied. (Sunil Chopra and Peter Meindl, 2007)

Ronald and Luk also identified that in their study, Lack of inter-organizational collaboration for information systems is one of a reason for the overuse of expensive and unsafe air charters, failure to pre-plan stocks, congestion at ports (Rolando M. Tomasinia and Luk N. Van Wassenhoveb 2009).

2.3.5 External Factors Affecting HSCM Practices

External actors are those that cannot be changed or affected but a given organization can adopt and cop up with them (Kunz & Reiner 2012).

2.3.5.1.1 Legal and Political Factors

Different researchers described that adequate assistance from the government, fast customs clearing process, safety & security and flexibility of local governments will increase performance of humanitarian logistics(Kunz & Reiner 2012).

Governments hold the main power with the control they have over political and economic conditions and directly affect to supply chain processes with their decisions. (Wassenhove, 2006).

According to Oloruntoba and Gray (2007), a major difficulty in coordinating the humanitarian supply chain has strong ties to the political interests and military forces of donors and recipient countries, the requirements of the industry of donors, and the lack of coordinated plans.

As per Seekins (2009), Government situational factors, such as the type of regime, the national regulations toward relief organizations, the efficiency of the state, the level of corruption, are factors which has an effect on organizations' operational decisions and their capacity to conduct humanitarian logistics operations. (Seekins, 2009), and even a cooperative government has a factor in attracting relief organizations on its territory (McLachlin and Larson, 2011; Van Wassenhove, 2006). The security situation in a country also dependent from the government or its absence, and highly influences the performance of the logistics response (Long and Wood, 1995).

2.3.5.1.2 Donors Regulation

Government, donors, public and private organizations are significant players in the humanitarian supply chains. But, donors have become particularly influential in prompting humanitarian organization to think in terms of greater donor accountability and transparency of the whole supply chain (Wassenhove, 2006).

The global humanitarian assistance report (GHA, 2015) describes that more than 75% of all contributions for humanitarian assistance were provided by governments in 2014. These governmental donations are often tied to wider political agendas and thus may not be the result of the performance of humanitarian organizations (Schiffing and Piecyk 2014).

Thomas and Kopczak (2005), described that huge portion of funds are allocated for direct relief but so insufficient for logistic strategic preparedness and investment on infrastructures and systems development. This is further ascertained by Wassenhove (2006) that many humanitarian organizations have no adequate funds to finance the training and procedures that will lead to better preparedness and therefore more effective logistical operations. This is also supported by Maon, Lindgreen&Vanhamme (2009) that, organizations, which receive funds for short term relief aids, don't have flexible funds to invest on long term development and implementation of more sophisticated SCM tools.

2.3.5.1.3 Socio-Economic Situational Factors

Gary (2014) described the socio-economic challenges as, uncertainty in demand and supply, uncompetitive of market economy, the absences of local suppliers, availability stiff competition, absences financial donors, the culture and language of the host country, high inventory and transportation cost and lack of trust among the supply chain partners.

Availability of local suppliers is among one of a Socio-economic situational factor which affect the performance of humanitarian logistics (Altay. 2009; Dowty& Wallace 2010; Maon et al., 2009). In a well-developed economy, even an important item can be purchased from local suppliers, and personnel can be employed locally for logistical activities whereas in a less developed economies, volatile operating conditions such as fluctuating freight rates and unpredictable transit schedules are prevalent. Besides, all supplies must be imported, and most tasks must be managed by expatriate staff (Kunz & Reiner 2012; Choi et al. 1996).

According to Mentzer (2001) the humanitarian supply chain as the network created through the flow of services, supplies, information and finances between donors, beneficiaries, suppliers and different units of humanitarian organizations, in order to deliver physical aid to beneficiaries. So, the socio-economic relationship has a factor on the supply chain performance of organizations.

2.3.5.1.4 Technological Factors

As per Ngonidzaha & Micheline (2016), to ensure a responsiveness to the natural disaster occurrences, the UNWFP have made strategic and critical investments in infrastructure and technology in which to encourage innovation across the organization and to be a visible means towards fostering efficiency.”Balcik & Beamon also described that lack of availability of technology in the humanitarian field resulting in information being “unreliable, incomplete or non-existent” for the most part; the fixed distribution network that exists in private business with predetermined fixed locations for distribution centers; the private sector enjoys a typical inventory control whereas in humanitarian logistics there are “high discrepancies in lead time and demand location; in the private sector performance measurements are based on “maximizing profits while minimizing costs” whereas the humanitarian field measures by factors such as “response time and the ability to meet the needs of the disaster. (Balcik & Beamon, 2005).

Humanitarian supplies need robust equipment that can be set up and dismantled quickly enabling them to be extremely adaptable and prepared for the unexpected as circumstance can change very quickly from one moment to the next. Unfortunately, logisticians in this sector often have to work with fragmented technology and poorly defined manual processes.

2.3.5.1.5 Infrastructural Factors

Infrastructure factors, such as the availability of a road network, railway, airports, power supply, play an important role in the performance of humanitarian logistics (Chakravarty, 2011). The existence of a well-developed road infrastructure will facilitate the logistical operations while a poor road network tends to interrupt and delay the distribution of relief items. For example, the availability of an airport close to the disaster area will facilitate the delivery of relief aid.

Availability of adequate ICT networking infrastructure also basic for the effectiveness of supply chain as per Kovács and Spens (2007) the use of information integration in humanitarian supply chain improves supply chain processes that involve procurement, transport, storage and distribution of supplies to beneficiaries.

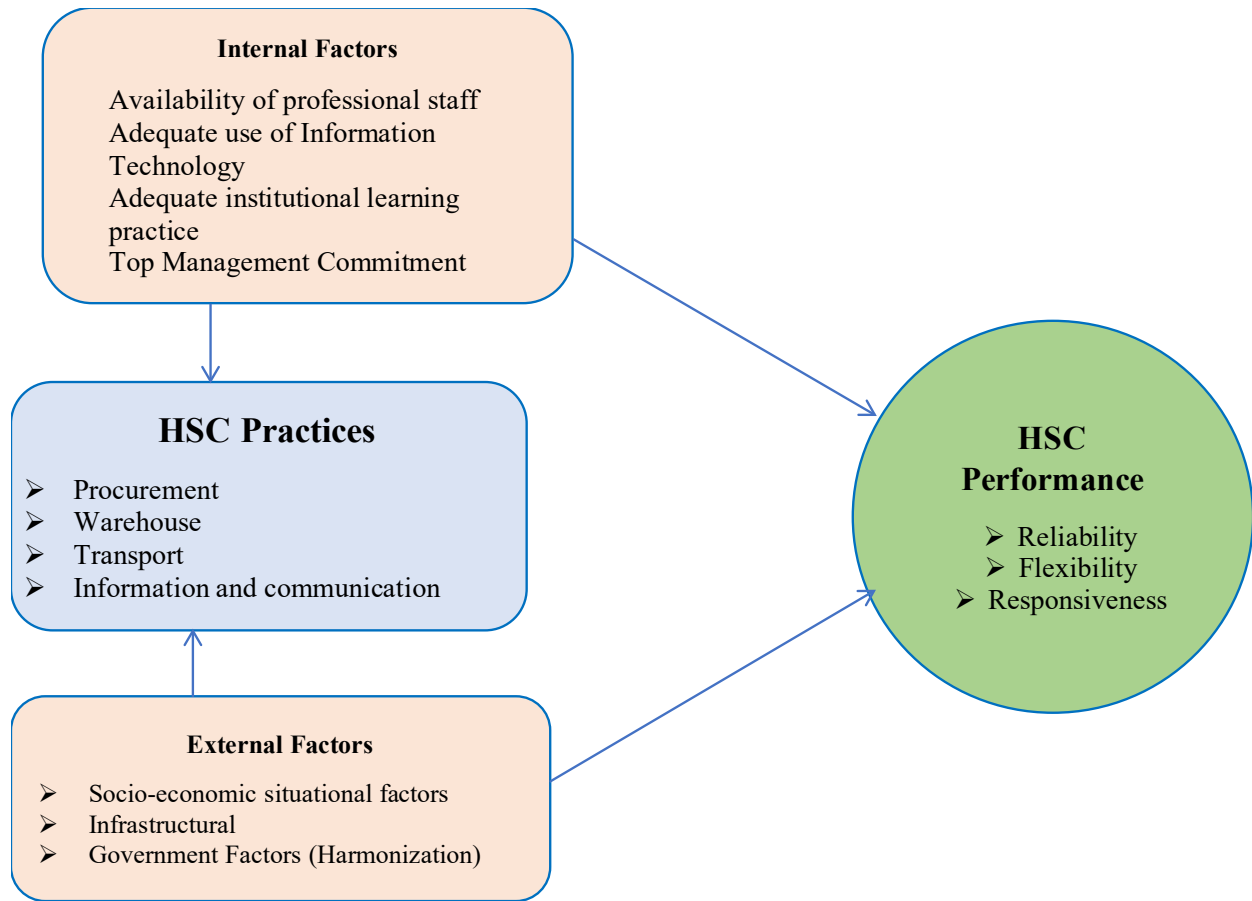
2.4 Conceptual Framework

The focus of this study is to assess the practices and factors that affect supply chain performance in humanitarian response. This study has different independent variables that investigated in relation to the dependent variable. The independent variables comprised of factors such as; HSC planning, communication and coordination, transporters' availability, efficiency, infrastructural issues and HSC performance with intended beneficiaries.

The independent variables investigated with a view to finding their effect on supply chain performance in humanitarian response of IMC in Ethiopia. In order to understand the end-to-end supply chain, it is believed by the study to take a step in mapping the Supply chain frame work of IMC in Ethiopia so it wasl be better to illustrate the network structure and as built working processes.

The conceptual framework is a combined modification of the conceptual frameworks developed by prior studies (Yu, Yalcin, Ozpolat and Hales, 2015). Based on this the study developed conceptual models to indicate the interconnection between dependent and independent variables.

Figure 1:Figure 1 Conceptual framework of the study Note: Conceptual framework was adopted from Klumpp & Abidi (2011) modified



CHAPTER THREE

METHODS OF THE STUDY

3.1 Introduction

The drive of this chapter is to explain the research methodology and techniques that is used to conduct the study. The practical research methods employee to answer the research

questions and fulfill the purpose of the research is presented in this chapter. It attempts to provide an overview of the research study area, the research approach, design and method, population and sample, data source and type, data collection instrument, data collection procedure, ethical considerations, and finally the methods of data analysis.

3.2 Description of the Study Area

The study was taken place in Addis Ababa in which the surveyed international humanitarian organization firm head quarter is located. Also, Addis Ababa is the center of Ethiopia's diplomatic, political, economy and almost all the head quarter of the private and public sectors are situated in this city.

The study created a detailed awareness and information on the research of humanitarian supply chain practice and factors affecting its performance supply chain Performance in the IMC Ethiopia Program. IMC Ethiopia is currently working in Tigray, Somali, SNNPR, Oromia, BenshangulGumuz, Gambella ,Afar and Amhara regions. The head office is found in Addis Ababa. The study covers all the operation areas in Ethiopia.

3.3 Research Approach

Research in common phraseology refers to a search for knowledge. This study employed both qualitative and quantitative methods to recognize the target and provide a conclusive answer for the research questions outlined in chapter one the study employed a mixed approach. It included qualitative and quantitative information which focuses on the various aspects of humanitarian supply chain practices and factors affecting its performance related to International Medical Corps Ethiopia Office. This helps to largely understand the reality in both objective and subjective dimensions and to benefit from the different advantages of the two methods like: better explaining and generalizing. Overall, it employed mixed approach, the majority of the data collected using quantitative approach and the qualitative approach used to cover subjective matters to better explain realities, and to triangulate the study's results of the quantitative data.

3.4 Research Design

Research is undertaken with the most professional manner. It helps to critically examining the various aspects of professional works. It is a habit of questioning what you do and a systemic examination of the observed information to find answers with a view to instituting appropriate changes for a more effective professional service. The research study is a process of collecting, analysing and interpreting information to answer questions. The objectives of the study determined during the early stages of the research are included in the design to ensure that the information collected is appropriate for solving the problem (Bhattacharjee, 2012).

The present research study is the descriptive and explanatory type in the methodology followed for the study. As per Mugenda (2003), descriptive research is a process of collecting data in order to answer questions concerning the current status of the subjects in the study and it aims to describe what exists with respect to variables or conditions in a situation. The methods involved a range of activities: from the survey which describes the status quo to the regression study which investigates the relationship between variables.

The main use of descriptive statistics is to explain supply chain and its related performance information or data using numbers. The explanatory research design is much more related to defining the cause and effect or causality relationships among independent and dependent variables. For that reason, this research engaged in descriptive and explanatory research approaches to give an adequate depiction of the association between the factors affecting humanitarian supply chain and supply chain performance.

3.5 Data Source and Types

The researcher has mainly primary sources for data collection. From amongst the data required following data has collected using primary resource. The data required for the study is opinion of sampled respondents of humanitarian employees i.e. opinion of humanitarian workers from various humanity work sites from highly catastrophes areas, manager of respective departments

and humanitarian sites, key suppliers and transporters. The opinions of humanitarian workers regarding their humanitarian activities, supply chain operations, logistics and other major supply chain functions and supplement of respective supply chain issues, factors influencing readers is required. Semi structured and unstructured interview with logistics Director, Logistics Coordinator, HR and Admin Manager and Program Specialist-Grants & Reporting Manger are also conducted. Secondary data collected from IMC website, IMC Logistics guideline of the organization, reports, books, and published and unpublished documents to make the study comprehensive. To support the findings from the questionnaire, review of related literature is conducted to compare the alignment of the research findings with previous studies and enrich the findings.

3.6 Population and Sample

3.6.1 Target Population

Geoffrey, David & David (2005) defined population as it is all individuals of interest to the researcher As per the actual data obtained from the International Medical Corps, Ethiopia Country Office, currently the organization has eight field offices in different regions of the country, focusing on refugee and local community development projects and its head office in Addis Ababa. Accordingly, the study included all regional offices Addis Ababa, Ethiopia- IMC Country Office. The organization has a total of 1016 countrywide staffs permanently employed on full time contractual agreement.

3.6.1 Sample Size

The organization has a total of 1016 national staffs hired on full time contractual agreement. The total population size of this study was IMC Ethiopia staff which are professional employees total is 734 and Sample size is 259. Please note that because of the current situation of Northern part of the country Afar-90, Dansha-56 and Shire 136 staff are excluded in the research.

Sampling calculation for the study of supply chain practices was based on the surveyed organization's employees and managers operational was 734 and Sample size was 259 as shown from the below Yamane (1974) formula.

$$n = \frac{N}{1 + N * (e)^2}$$

* 95% confidence level and e = 0.05 are assumed n -The samplesize = 259

$$n = \frac{734}{1 + 734(0.05)^2} = 259$$

N -The population size= 734

e- The acceptable sampling error=0.05

Therefore, proportional sample size from each stratum was calculated by using the following formula.

$$n_i = \frac{n * N_i}{N}$$

Where: ni= sample size for individual departments Ni= the total number of employees in each departments/stratum, N=the total number of population in the study and n= the total sample size for selected stratum:

TABLE 2 SAMPLE SIZE IMC ETHIOPIA STAFF NUMBERS IN THE COUNTRY

Site Name	Total Staff	Proportion	Sample
Addis Ababa	75	0.352861	26
Dollo Ado	276	0.352861	97
East Hararge	76	0.352861	27
Gambella	186	0.352861	66
Jigjiga	76	0.352861	27
Guji	35	0.352861	12
Wolita	10	0.352861	4
Total	734		259

Source: IMC,2021

In this is study Addis Ababa, Bokolomayo – Somalia Region, Gambella – Gambella Region, Harar – East Hararghe Zone and West Hararge – Oromia Region, Jigjiga (Awuber and Sheder),

Gode and Negob Zone – Somali Region and Negele – Guji Zone – Oromia Region were included.

Supply chain staffs working in Addis Ababa and all field offices and some higher level position staff in Addis Ababa were included as per the above target population. The researcher has decided to consider the entire population in the study for only supply chain staff, i.e., to conduct census survey, rather than sampling from the population due to the small number of the target population in eight field offices. This study assumed Israel (2013) who indicated as if the target population is smaller (e.g., 200 or less) census survey is very appropriate and effective since virtually all population would have to be sampled in small populations to achieve a desirable level of precision. Kothari (2004) also stated that when using a stratified sampling technique, we usually follow the method of proportional allocation under which the sizes of samples from the different strata are kept proportional to the size of the strata. Specifically, if P_i represents the proportion of population included in stratum i , and n represents the total sample size, the number of elements selected from stratum i is $n \cdot p_i$.

3.7 Data Collection Tools, Methods and Procedures

The questions have been developed to get responses specific to objectives of the study that are proposed to fulfil. For the purpose of analysis primary data was collected directly from the employees of the study organization through questionnaire and interview. The primary data was collected from the indicated humanitarian sites through a self-administered and structured survey instrument (i.e. interview schedule). It also permitted categorizing factors of humanitarian supply chain performance and is expected to answer the research questions, based on different literatures on supply chain functions. It has three major parts (in addition to the one which introduces the purpose, ethical considerations, and over all guide). Initially, it included sampled respondents' background information corresponding to gender, age, and education, experiences in IMC, job grade, and duty station. The next part included closed questions mainly enclosed by a 5-point "Likert" scale with 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree questions related to supply chain performance and factors affecting this performance in IMC Ethiopia. Finally, open-ended question was presented to become opinion

and suggestions of respondents to improve the supply chain function performance. The questions related to supply chain practice, challenges and factors affect supply chain performance

The questionnaires distributed to all participants in the outlets of Addis Ababa through Microsoft Outlook and through hardcopy to supply chain staffs working in Addis Ababa as the organization uses Microsoft Outlook as a means of formal electronic communication. The data collection in the head office conducted by the researcher and for the field offices; focal persons from supply chain department assigned. Face-to-face through Skype and telephone briefings was conducted when further clarifications are required on the questionnaire,.

The interview with the country Logistics Director and Logistics Coordinator conducted with a mix of semi structured and unstructured question which are helped in triangulating findings of the questionnaire. A tape recorder also used to save the information. The questionnaire for the main study was refined based on the feedbacks the experts gave.

3.8 Reliability and Validity

3.8.1 Validity test

The validity of research results was based on the initial research design and methodology. Therefore research design and methodology has been developed by researcher very carefully, as it forms the foundation for the entire research process for the present study. Winter (2000) explained as validity is concerned with two main issues: whether the instruments used for measurement are accurate and whether they are measuring what they want to measure. Internal and external validity are also the two most popular different dimensions to the concept of validity. Internal validity is the extent to which the measurement of the questionnaire provides the data needed to meet the purpose of the study or it refers to the extent to which the questionnaire measures what the researcher intends to measure to ensure internal validity. It confirms that the researcher investigates what s/he claims to be investigating. On other hand, internal validity concerned with the extent to which the research findings can be generalized to wider population. The respondents, the situations, the interviewer, and the data collection instrument can be sources of error in research according to Kothari (2004).

3.8.2 Pilot Test

The Pilot Study is an exploratory study done preliminary, to help in purifying the problem, develop or refine hypothesis or test and refine the data collection methods. A pilot study was conducted on 10 respondents for the feasibility of the study. It is continuously desirable, if at all possible, to conduct a pilot study before administering a self-completion questionnaire or structured interview schedule to the selected sample. In actual fact, the desirability of piloting such instrument is not solely to do with trying to ensure that questions operate well, piloting also has a role in ensure that questions operate well, piloting also has a role in ensuring that the research instrument as awhile function well. Pilot study may be particularly crucial in relation to research based on the self-completion questionnaire, since there was not an interviewer present to clear up any confusion.

3.8.3 Reliability test

Ritchie and Lewis (2003) stated that reliability is the degree of internal accurateness and internal consistency with which an instrument measures the constructs it is designed to measure. Reliability is recognized as to what extent the research findings can be replicated, if another study is undertaken using the same research methods.

TABLE 3 RELIABILITY STATISTICS

Variables	Reliability Statistics	
	Cronbach's Alpha	N of Items
Procurement	0.819	6
Warehouse	0.802	4
Transport	0.840	6
Information and Communication	0.846	4
Internal Factor	0.780	10
External Factor	0.816	12
Performance	0.801	25

Source: (SPSS Output, 2022)

To ensure quality of data, study responses on the questionnaire gained from the research advisor, logistics Director, Logistics Coordinator and then pilot test was conducted. According to George and Mallery (2003), it generally ranges between 0 and 1 for the test result of Cronbach's alpha

reliability coefficient. It is noted that the nearer Cronbach's alpha coefficient to 1.0 the superior the internal consistency (reliability) of the items in the scale. This indicates the measure (data collection tools) should provide the same answer on another occasion or similar result should be obtained by another researcher using the same measuring instrument (Saunders 2007).

3.9 Data Analysis

With a view to accomplishment of study objectives, the primary data (collected through interview schedule) have been analyzed with the help of tables and figures. Simple percentage method, count, standard deviations and mean have been used for the tabulation of primary data that is a data analysis has been formulated, prepared using tables. The data have been also analysed by using measures of central tendency, measures of dispersion and the hypothesis have been tested using regression and correlation analysis. With regards to the descriptive analysis the study analyzes using mean and standard deviation. On the other hand, inferential statistics techniques, specifically regression analyses apply to verify the direction of relationships between the dependent variable and the independent variables. The study used SPSS software package in the entire analysis part.

Model specification

The multiple linear regression model of the study is based on the theoretical regression model as indicated follows

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + e$$

Where:

Y= Organizational Performance

a= the y intercept.

- X_1 – Top Management Commitment
- b_1 = the regression coefficient Top Management Commitment
- X_2 - Availability of professional staff
- B_2 = the regression coefficient of Availability of professional staff
- X_3 – Adequate use of Information Technology
- B_3 = the regression coefficient of Adequate use of Information Technology
- X_4 – Adequate institutional learning practice

- B_4 = the regression coefficient of Adequate institutional learning practice
- X_5 –Government Factors (Harmonization)
- B_5 = the regression coefficient of Government Factors (Harmonization)
- X_6 –Infrastructure
- B_7 = the regression coefficient of Infrastructure
- X_7 –Socio-economic situational factors
- e = error term.

3.10 Ethical Consideration

To build trustworthiness in the mind of respondents it is necessary to give full information about the purpose of the study and the researcher's status and role. Such action has assisted the respondents to avoid dishonesty and not to cause harm of any body by any action of the study. Giving respect for participants' right not to take part in the study and disclosing of the need for confidentiality of their response and use of data to be supposed to increase the credibility. Continuing the objectivity of the study in the process of data collection, analysis of the collected data and report preparation stages have help to enforce researcher to keep the balance and avoid bias. The researcher will not disclose any personal information of the respondents and that will explain during the distribution of the questionnaire and, for the interviewee before conducting the interview. In addition, credit gave to the authors of documents referred. The International Medical Corps senior management team will also be providing a copy, prior to the publication of the research document.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1 Introduction

The researcher collected both qualitative and quantitative data to undertake this study; the analysis was also conducted one after the other. Together quantitative and qualitative data were collected from staff of the company (IMC Ethiopia) whose responsibilities are directly related to supply chain operations.

4.2 Response Rate

TABLE 4 RESPONSE RATE

Strata (Sites)	Number of questionnaires distributed	Number of questionnaires Collected	Number of Questionnaires collected
Addis Ababa	26	24	92%
Dollo Ado	97	75	77%
East Hararge	27	21	78%
Gambella	66	49	74%
Jigjiga	27	25	93%
Guji	12	9	75%
Wolita	4	3	75%
Total	259	206	80%

Source: (SPSS Output, 2022)

In this study, a total of 259 questionnaires were distributed to targeted and samples selected and 206 were obtained and collected. The remaining 53 questionnaires were not collected due to three main reasons; first some of them were the selected sites were in remote area and due to their nature of work they could not to fill the questionnaire, second some of them were leave from their placement of job, and finally some of them were on annual leave. This response rate which is around 80% is considered very good to enable the determination of the phenomenon that exists as it is as statement. They state that the response rate of above 75% is recommended for the generalization of the study findings as per the study of (Anthony, 2016). The above table shows

that the study included seven sites of the surveyed organization. Most of the sampled respondents were from Dollo Ado and Wolita contributed least respondents.

4.3 Demography Profile of Supply Chain Partners

Table 5 Respondents' Demography Characteristics (N=206)

Demography Characteristics /Items		Frequency	%
Gender of Respondent	Male	144	69.9%
	Female	62	30.1%
Respondent age	Below 30	57	27.7%
	31 - 40	111	53.9%
	41 - 50	38	18.4%
	Above 51	0	0.0%
Education Level	Diploma	40	19.4%
	First Degree	133	64.6%
	Master's Degree & above	33	16.0%
Working year	Less than a year	38	18.4%
	1-5 years	54	26.2%
	6 -10 years	77	37.4%
	above 11 years	37	18.0%
How long have you been working in humanitarian sector?	Less than a year	30	14.6%
	1-5 years	98	47.6%
	6 -10 years	67	32.5%
	above 11 years	11	5.3%

Source: (SPSS Output, 2022)

Table 5 displays that out of 206 sampled respondents the study conducted this research on, more than quarter 62 (30.1 %) of sampled employee respondents were female and the remaining (the majority, 144 [69.9 %]) of the total sampled respondents were male. It gives great confirmations that the male gender could be leading in humanitarian working or employment environment. The result implies that female and male respondents were not adequately represented in the study.

The majority of the interview responses indicated that their difference may be related to inaccessible working areas of humanitarian services. This calls a need for further support to women through various funds or needs to empower more women to engage in more humanitarian activities.

This table indicates that the majority of the respondents 111 (53.9 %) were gathered in age between 31 and 40 age and no sampled respondents look as if who had more than 51 years of age. This could be reflected the study collected research data from young adults who have been experiencing humanitarian organizations activities. The same exhibits that, among 206 sampled respondents, 46.3 % of the total respondents were of age below 35 and above 18 years or there were young adults, 36.8 % of them were of age 36 to 55 years or middle-aged adults, and only 0.0 % of the respondents were older adults or aged older than 55 years.

Table 5 also displays respondents' educational position and it shows that 40 (19.4 %) respondents three had diploma, 133 (64.6 %) sampled respondents had first degree and the remaining had MA educational background. The above table displays that, among 216 sampled humanitarian logisticians or respondents, 47.3 % of the total respondents had diploma, 42.3 % of them were university first degree graduate and the remaining 10.4 % of them attended university postgraduate level.

Further, Table 5 shows that, among the selected respondents, 18.4 % of the sampled respondents worked in their respect organization for one year; 26.2 % worked for 1 to 5 years and 37.4 % of them worked from six to 10 years. This depicts that majority had worked for more than one years. The study results shows that majority of the respondents had worked in the study area for longer time. In the same way, among the selected respondents, 14.6 % of the sampled respondents worked in humanitarian sector for one year; 47.6 % worked for 1 to 5 years and 32.5 % of them worked from six to 10 years. It was supposed that the sampled staffs would provide appropriate responses for the humanitarian supply chain performance effectively. The study was charmed that most of the respondents were university graduated (well educated), worked in humanitarian projects and they were passed most of their working time in the selected project.

4.4 Humanitarian Supply Chain Practice of IMC Ethiopia

This study collected primary data from sampled respondents about the Supply Chain Management practices in the surveyed organizations under procurement, transportation, and warehouse management and Information and communication. As respondents gave responses by using the five point Likert scale, it followed Moidunny's (2009) mean score analysis considerations as stated by; mean score that is ranged from 1.00 to 1.80 and it was considered as very low. Besides, the categorizations included the following; very high for mean score from 4.21 to 5.00 and others included 1.81 - 2.60 as low, 2.61 - 3.20 as medium, 3.21 - 4.2 as high.

Table 6 Humanitarian Supply Chain Practice of IMC Ethiopia (N=206)

Variables (Items)	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IMC procurement request (PR) clearly identifies need/demand to be procured.	3.72	1.13	-0.965	0.169	0.329	0.337
All PR is processed through threshold as per IMC manual	3.86	1.066	-1.033	0.169	0.575	0.337
Supplier selection of IMC Ethiopia is focused on price and specification.	3.31	1.19	-0.359	0.169	-0.776	0.337
Purchase Order /service agreement / contract is respected by supplier and IMC	3.15	1.185	-0.41	0.169	-0.748	0.337
IMC Ethiopia has a good and long run relationship with the suppliers	3.48	1.196	-0.503	0.169	-0.69	0.337
All requested items or service are delivered with in required time and date	3.34	1.21	-0.245	0.169	-0.925	0.337
Grand Mean for Procurement	3.47					
IMC Ethiopia has sufficient and appropriate warehouse to temporarily store supplies	3.83	1.069	-0.681	0.169	-	0.337
IMC Ethiopia's warehouse location is very accessible for distribution	3.62	1.219	-0.482	0.169	-	0.337

IMC Ethiopia uses warehousing as a facilitator for coordination, sorting, and packaging activities for easier and efficient aid delivery to the beneficiaries	3.46	1.252	-0.461	0.169	- 0.817	0.337
IMC Ethiopia's warehouse is situated in a manner to improve material distribution operation	3.39	1.259	-0.333	0.169	- 0.986	0.337
Grand Mean for Warehouse	3.575					
IMC Ethiopia uses all modes of transportation available for the movements of supplies	3.15	1.256	-0.174	0.169	- 1.103	0.337
Third party transport companies are cooperative to IMC Ethiopia during emergencies to transport supplies/items.	3.78	1.151	-0.754	0.169	- 0.393	0.337
IMC Ethiopia delivers relief supplies to where they are required during emergencies.	3.59	1.13	-0.567	0.169	- 0.272	0.337
There are sufficient transport companies that provide transportation services for emergency works with IMC	3.13	1.217	-0.139	0.169	- 1.004	0.337
There is a prequalified list of transport companies for IMC to choose from during emergencies	2.93	1.325	0.059	0.169	- 1.249	0.337
IMC uses various transport optimization models to deliver supplies with the least cost possible	2.77	1.027	-0.239	0.169	- 1.027	0.337
Grand Mean for Transport	3.23					
Having of full information and good communication between the supply chain staffs (such as head office, primary distribution point and operational Woredas)	3.33	0.935	-0.874	0.169	- 0.094	0.337
Information exchange between the organization and key 3rd party logistics /transporters and other partners in timely and accurate manner.	3.17	0.899	-0.556	0.169	- 0.502	0.337
IMC Ethiopia has system to communicate all supply chain staff in AA and field office.	3.34	1.069	-0.689	0.169	- 0.177	0.337

Good communication and coordination between supply chain of the programs with other departments (such as finance and logistics)	3.18	1.111	-0.457	0.169	0.782	-	0.337
Grand Mean for Information	3.26						
Grand Mean Humanitarian Supply Chain Practice of IMC Ethiopia	3.38						

Source: (SPSS Output, 2022)

4.4.1 Procurement Practices

The advance purchase and pre-positioning of relief supplies speed up the initial humanitarian response after the strike of a disaster. It is a strategic decision that requires significant amount of investment both in infrastructure and inventory. It eliminates the difficulties and disadvantages of procuring after disaster with faster response time (Duran , 2013). Thus, this study surveyed the procurement practices of humanitarian organization that is in IMC. The result indicated that the mean score 3.67 was rated as very good. This implies that they had a rational attitude towards procurement practices in humanitarian organization. Results in the above table show that all the mean values were greater than 3.15 and less than 3.86; this is an indication that the respondents agreed with the various statements or items. Similarly, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness are Kurtosis is below 3 and it shows the data are bell shaped. Consequently it can be said that procurement is highly practiced in the studied organization. For example, the highest mean score (3.86) showed that all PR is processed through threshold as per IMC manual. IMC procurement request (PR) also clearly identifies need/demand to be procured. But Purchase Order /service agreement / contract is not highly respected by supplier and IMC. Zewdi (2021) also found the same results such as the overall mean for the procurement practice is 3.73 and 1.08 for that of the standard deviation. Consequently, this study concluded that procurement is exceedingly practiced in the studied organizations .

4.4.2 Warehousing Practices

Warehouse is significant in supply chain operations because it as the crow flies supports diminish suffering of affected people by dropping the time to reach them although also encouraging cooperation and collaboration. It is due to the fact that between large numbers of governmental, non-governmental, national and international organizations working in the field of disaster management (Maharjana& Hanaoka, 2017). This study assessed the warehousing practices of International Medical Corps of Ethiopia. The result indicated that the mean score 3.575 was rated as very good. This indicates that they had a rational attitude towards warehousing practices in humanitarian organization. It illustrates that there are good practices of warehousing as collection sites can act as transshipment points, warehouses, and as places to prepare and pack goods. The majority of the interview responses indicated that this humanitarian organization accumulates stocks in good conditions as other relief chain. They can be located in impacted areas or near beneficiaries, border crossings, or good distribution areas or landing field. Results in the above table show that all the mean values were greater than 3.39 and less than 3.83; this is an indication that the respondents agreed with the various statements or items. In the same way, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness and Kurtosis are below 3 and it shows the data are bell shaped. Consequently it can be said that the highest mean (3.83) indicated that it sufficient and appropriate warehouse to temporarily store supplies and the next highest mean score shows that IMC Ethiopia's warehouse location is very accessible for distribution. This study indicates that it needs to improve material distribution operation in IMC Ethiopia's warehouse. Stock asset management is the process of organizing warehouses at certain points and organizing the supplies held in those warehouses for delivery. Warehouses and transshipment points should be located strategically to make use of available infrastructure guaranteeing safety conditions for the assets and people (Adem, 2017).

4.4.3 Transportation Practices

Transportation marks it conceivable for support and benefit to reach those in need (Jane, 2013). Transportation in a disaster or humanitarian emergency can run the higher range. It can embroil in global sourcing, military transport, drop shipment, noncommercial and commercial transport, third party logistics firms, freight forwarders, charter aircraft, or even local and ancient

transportation such as mules and donkeys. This study surveyed the transport practices of humanitarian organization of IMC Ethiopia. The result indicated that the mean score 3.23 was rated as very good. This implies that they had a rational attitude towards transport practices in humanitarian organization. It shows that goods are sometimes brought into a country at an entry point and then moved to collection sites run by relief organizations. Results in the above table show that all the mean values were greater than 2.77 and less than 3.78; this is an indication that the respondents agreed with the various statements or items. Similarly, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness are Kurtosis is below 3 and it shows the data are bell shaped. Consequently it can be said that the highest mean (3.78) indicated that third party transport companies are cooperative to IMC Ethiopia during emergencies to transport supplies/items. IMC Ethiopia also delivers relief supplies to where they are required during emergencies. In relief work, both in disasters and complex humanitarian emergencies, damaged infrastructure, inaccessible infrastructure, and the lack of infrastructure needed for large scale assistance lead to bottlenecks, delays, and congestion at entry points to the disaster area (Anthony, 2016).

4.4.4 Information and Communication Practices

Nowadays, it is easily understood that information communication technology dramas a significant influence in contemporary disaster management mechanisms, serving humanitarian organizations to classify and prevent disaster risk in operating humanitarian actions. Consequently, this study assessed this practices in humanitarian organization and results in the above table show that all the mean values were bigger than 3.18 and not more than 3.34; this is a symptom that the respondents less agreed with the various statements or items. The grand mean score (3.26) designated it is the lowest supply chain practise in IMC Ethiopia. In the same way, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness are Kurtosis is below 3 and it shows the data are bell shaped. As a result, it can be thought that the highest mean (3.33) indicated that third party transport companies are cooperative to IMC Ethiopia during emergencies to transport there is somewhat full information and good communication between the supply chain staffs (such as head office, primary distribution point and operational Woredas). But the lowest mean (3.17) indicated the improvement practices in the surveyed

humanitarian organization as information exchange between the organization and key 3rd party logistics /transporters and other partners in timely and accurate manner. In addition, it needs to enhance the communication practices including coordination between supply chain of the programs with other departments (such as finance and logistics). The majority of the interview responses asserted the benefits of IT. It included adoption of automated signaling system, effective communication network and creation of IT based recruitment system. For building infrastructure protection, Bhattacharjee (2014) confirmed that T can be used for advanced surveillance systems, geospatial location accountability and navigation system for emergency responders, integrated rapid visual tool, alert & warning and area surveillance.

The overall mean score (3.38) was rated as very good. This implies that this supply chain management practices that produced somewhat better process performance. This implies that the supply chain practices in IMC Ethiopia somewhat engages with performance expectation on both input and output sides of supply chain activities.

4.5 Assessing Humanitarian Supply Chain Performance Factors of IMC Ethiopia

This study collected primary data from sampled respondents about the Supply Chain Management performance in the surveyed organization. As respondents gave responses by using the five point Likert scale, it followed Alexander's (2009) mean score analysis considerations as explained in the previous part. This study assessed the internal factors of humanitarian supply chain performance in the surveyed organization and results in the above table show that the grand mean score (3.68) and it was evaluated as very good. By the same token, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness are Kurtosis is lower than 3 and it shows the data are bell shaped. Subsequently, it can be thought that the highest mean (3.98) indicated IMC supply chain service performance affected by the limitation of hiring enough supply chain staffs. The subsequent maximum mean score displays that the consistency in application of the supply chain procedures by all staffs affected the supply chain performance. IMC has access to necessary supply chain online courses with certification.

4.5.1 Level of Internal Factors

Table 7 Internal Humanitarian Supply Chain Performance Factors of IMC Ethiopia (N=206)

Variables (Items)	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
IMC Ethiopia has top management commitment to provide training to supply chain staff	3.4	1.044	-0.375	0.169	-0.639	0.337
IMC Ethiopia has top management commitment to allocate resource to supply chain staff	3.04	1.088	-0.018	0.169	-0.76	0.337
IMC Ethiopia has top management commitment to provide timely decision for supply chain staff request.	2.99	1.204	0.028	0.169	-1.012	0.337
Grand Mean for top management commitment	3.01					
IMC supply chain performance affected by availability of a trained and experienced supply chain staffs which resulted from the poor recruiting mechanism.	3.52	1.053	-0.596	0.169	-0.457	0.337
IMC supply chain service performance affected by the limitation of hiring enough supply chain staffs.	3.98	0.883	-0.605	0.169	-0.295	0.337
The consistency in application of the supply chain procedures by all staffs affected the supply chain performance.	3.97	0.866	-1.035	0.169	1.606	0.337
Grand Mean for Availability of professional staff	3.82					
IMC Ethiopia has well designed supply chain process enabler information technology system	3.85	0.868	-0.608	0.169	-0.125	0.337
IMC Ethiopia has own system/data base to communicate /share information for supply chain department in HO (head office) & FO (field office)	3.85	0.893	-0.994	0.169	1.333	0.337

Quality and speed of information flow in IMC is up to the standard.	3.91	0.812	-0.436	0.169	-0.222	0.337
Grand Mean for Adequate use of information Technology	3.87					
IMC has conducive environment to learn and knowledge sharing	3.90	0.568	-0.177	0.169	0.52	0.337
Supply chain staffs attend training and development workshops continuously	3.89	0.578	-0.148	0.169	0.348	0.337
IMC has access to necessary supply chain online courses with certification	3.93	0.624	-0.192	0.169	0.251	0.337
Grand Mean for Institutional learning practice	3.91					
Grand Mean for Overall	3.68					

Source: (SPSS Output, 2022)

Among the three grand mean scores, the Grand mean for institutional learning practice (3.91) was high and it shows performance of this humanitarian organization can be done through the logistics balancing requirements and resources to determine planned capabilities and resource crashes. This study found that IMC has conducive environment to learn and knowledge sharing and supply chain staffs attend training and development workshops continuously. It has access to necessary supply chain online courses with certification. Similarly, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness are Kurtosis is below 3 and it shows the data are bell shaped. This study also found that IMC supply chain service performance affected by the limitation of hiring enough supply chain staffs. The consistency in application of the supply chain procedures by all staffs affected the supply chain performance. This study calls an improvement are from the findings of the internal factors. IMC Ethiopia should enhance top management commitment to provide timely decision for supply chain staff request. Overall, this study found that there is a good institutional learning that helps to organize humanitarian logistics skills and the assignment of field logisticians to other relief operations was assed as good. As a result, the lesson learned in one relief operation could not be passed on to other logisticians of a given organization (Fritz Institute 2005).

4.5.2 Level of External Factors

Table 8 External Humanitarian Supply Chain Performance Factors of IMC Ethiopia (N=206)

Variables (Items)	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Availability of joint planning practice with other partners	3.80	0.722	-0.544	0.169	1.323	0.337
An overall inter-agency coordination and collaboration in humanitarian supply chain	3.86	0.847	-0.409	0.169	-0.139	0.337
Assistance from the government bodies	3.87	0.848	-0.424	0.169	0.103	0.337
Government restrictions or bureaucracy in the supply chain	3.78	0.914	-0.443	0.169	-0.022	0.337
Grand Mean for Government	3.82					
Availability of all-weather alternative roads negatively affected the delivery of relief (aid) goods to the beneficiaries.	3.82	0.974	-0.721	0.169	0.276	0.337
Adequate ICT networking infrastructure affects the performance of the organization supply chain service.	3.62	0.979	-0.502	0.169	0.258	0.337
Availability of warehouses at the project office areas and near beneficiary locations affect the supply chain performance of IMC	3.79	0.911	-0.63	0.169	0.238	0.337
Grand Mean for Infrastructure	3.74					
Cultural restrictions or norms affect IMC Humanitarian supply chain performance.	3.67	0.932	-0.491	0.169	0.043	0.337
Ability of local suppliers to understand purchase request or purchase order or specifications affect IMC supply chain operational performance.	3.77	0.971	-0.565	0.17	-0.053	0.338
The reliability of local suppliers affects the organization's supply chain operational performance.	3.70	0.96	-0.678	0.169	0.064	0.337
Availability of quality goods in local market affects the organization's supply chain operational performance.	3.82	0.913	-1.1	0.169	1.586	0.337
Potential local suppliers affect the organization supply chain operational performance.	3.28	1.168	-0.046	0.169	-1.138	0.337
Grand Mean for Socio-economic situational factors	3.65					

Grand Mean for Overall	3.74
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Source: (SPSS Output, 2022)

This study assessed the external factors of humanitarian supply chain performance in the surveyed organization and results in the above table show that the grand mean score (3.74) and it was rated as very good. The external mean score is much greater than internal factors. It implies that humanitarian supply chain practices exhibited much of internal factors. It is the lowest supply chain practise in IMC Ethiopia. On other hand, the standard deviation values were less than two which is a small standard deviation and therefore suggests that respondents had similar opinions. The results of Skewness are Kurtosis is below 3 and it shows the data are bell shaped. Consequently it can be said that the highest mean (3.86) and among the three grand mean scores, the Grand mean for government (harmonization) has been the highest mean score. It shows an overall inter-agency coordination and collaboration in humanitarian supply chain affects the organization operational performance. In addition, assistance from the government bodies affects the organization's humanitarian operation performance. Further, availability of joint planning practice with other partners when setting the supply chain planning affects the supply chain performance of IMC and government restrictions or bureaucracy in the supply chain affected the supply chain performance of IMC

The highest mean for infrastructure was 3.82 and it shows that availability of quality goods in local market affects the organization's supply chain operational performance. On other hand, the lowest mean (3.62) score shows that there is somewhat adequate ICT networking infrastructure affects the performance of the organization supply chain service.

4.6 Humanitarian Supply Chain Performance of IMC Ethiopia

This study collected primary data from sampled respondents about the Supply Chain Management performance in the surveyed organizations. As respondents gave responses by using the five point Likert scale, it followed Alexander's (2009) mean score analysis considerations.

Table 9 Humanitarian Supply Chain Performance of IMC Ethiopia (N=206)

Variables (Items)	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Humanitarian Supply Chain Performance in terms of reliability						
The right supplies are delivered	3.27	1.215	-0.041	0.169	-1.26	0.337
Fulfils all the requested demands.	3.79	0.979	-1.133	0.169	1.364	0.337
Delivered at the right time	3.74	1.021	-1.008	0.169	0.861	0.337
Damage free with the correct configuration	3.75	1.029	-1.079	0.169	0.894	0.337
Distribute all the procured goods timely	3.91	0.901	-0.554	0.169	0.154	0.337
Modern warehouse filling system	3.83	0.97	-0.558	0.169	-0.06	0.337
Controls the transporters	3.84	1.005	-0.819	0.169	0.349	0.337
Ensure the safe arrival of goods	3.92	1.056	-0.445	0.169	-1.122	0.337
Frequent information interruption	3.91	0.991	-0.968	0.169	0.72	0.337
Adoption of ICT improves the supply chain	3.76	1.064	-0.41	0.169	-1.05	0.337
Grand Mean for Reliability	3.77					
Flexibility of Humanitarian Supply Chain Performance						
Easily adaptable to adjustment order	3.73	1.093	-0.756	0.169	-0.069	0.337
Helps to continuously develop strategy	3.71	0.988	-0.134	0.169	-1.067	0.337
Allows quick and easy mapping	3.74	0.724	-1.204	0.169	3.441	0.337
Smoothly distributes	3.78	0.736	-0.962	0.169	2.636	0.337
Flexible enough to accommodate	3.83	0.789	-1.302	0.169	3.266	0.337
has a capacity to negotiate	3.77	0.811	-1.045	0.169	2.345	0.337
Exchange of information takes place timely	3.87	0.882	-0.559	0.169	0.124	0.337
Improves the ability of the supply	3.87	0.876	-0.531	0.169	0.315	0.337
Grand Mean for Flexibility	3.79					
Responsiveness of Humanitarian Supply Chain Performance						
Delivered at right time, place, quantity	3.77	0.943	-0.516	0.169	0.052	0.337
Timely report	3.78	0.987	-0.737	0.169	0.306	0.337
Proactively sends information	3.60	0.982	-0.524	0.169	0.346	0.337
IMC has sufficient transporters	3.78	0.915	-0.621	0.169	0.189	0.337
IMC transport service providers are capable	3.67	0.942	-0.486	0.169	-0.024	0.337
Adopting ICT in IMC increases the timely information sharing	3.74	0.98	-0.587	0.17	0.036	0.338
The ICT system increases the performance	3.68	0.99	-0.661	0.169	-0.024	0.337
Grand Mean for Responsiveness	3.72					
Grand Mean for Overall	3.76					

Source: (SPSS Output, 2022)

According to Table 9, the grand mean is scored as 3.76 and it shows that the majority of the responsiveness performance score is scores between in the rate of 3.27 – 3.92 and majority of the flexibility of humanitarian supply chain performance is considered high level. This shows that IMC's supply chain performance can be explained as having good speed in which the supply chain responds to changes in demand and the business environment. It also indicates the majority of the interview responses that IMC assumed flexibility is important, meaning the ability to respond to changes in the market both in terms of design and demand. Since it has to deal with instability and improbability and the ability to respond quickly and effectively to changes what also exemplifies an agile supply chain is flexibility (Magadi and Noor, 2017). It was suggested that effectiveness, flexibility and responsiveness is what makes a supply chain able to respond speedily and well operative to short-term changes in demand, supply or the environment, therefore in an agile manner. Above and beyond, the results of Skewness and Kurtosis are below 3 and it shows the data are bell shaped. The data again shows that, The highest mean score was (3.92) and it shows that the fleet management has a mechanism to ensure the safe arrival of all the shipped goods both in terms of quality and quantity. Others highest mean scores indicated that Warehouse units distribute all the procured goods at the correct quantity and with the correct documentation and there is frequent information communication interruption in IMC that affects the supply chain function. In addition a positive result also found as exchange of information takes place frequently, informally and/or in a timely manner. The ICT implementation improves the ability of the supply chain to rapidly adjust its capacity in response to customer demand. The lowest mean was 3.27 that shows the right supplies are somewhat delivered by IMC Ethiopia in the right quantity with all the necessary documentation for a demand requested.

4.7 Factors Affecting the Humanitarian Supply Chain Performance

4.7.1 Correlation Analysis

All the below correlation coefficient interpretations are based on Thomas (2012) way of determining the strength of relationship. In view of that, the size of the value of Pearson correlation (r) which can range from – 1.00 to 1.00 have the following interpretations. In shows

perfectly positive correlation If $r = 1.00$; perfectly negative correlation If $r = -1.00$, If $r = 0.00$ no relationship; weak If $r = 0.10$ to $r = 0.29$ or $r = -0.10$ to $r = -0.29$, if $r = 0.30$ to $r = 0.49$ or $r = -0.30$ to $r = -0.49$ Moderate; and if $r = 0.50$ to $r = 1.00$ or $r = -0.50$ to $r = -1.00$ Strong.

Table 10 Correlation Analysis (N=206)

Variables		A	B	C	D	E	F	G	H	
Top Management Commitment	A	Pearson Correlation	1							
		Sig. (2-tailed)								
Availability of professional staff	B	Pearson Correlation	.446**	1						
		Sig. (2-tailed)	0							
Adequate use of Information Technology	C	Pearson Correlation	.463**	.730**	1					
		Sig. (2-tailed)	0	0						
Adequate institutional learning practice	D	Pearson Correlation	.486**	.698**	.755**	1				
		Sig. (2-tailed)	0	0	0					
Government Factors (Harmonization)	E	Pearson Correlation	.211**	.280**	.308**	.254**	1			
		Sig. (2-tailed)	0.002	0	0	0				
Infrastructural	F	Pearson Correlation	.254**	.309**	.329**	.342**	.268**	1		
		Sig. (2-tailed)	0	0	0	0	0			
Socio-economic situational factors	G	Pearson Correlation	.244**	.278**	.244**	.230**	.460**	.424**	1	
		Sig. (2-tailed)	0	0	0	0.001	0	0		
Humanitarian Supply Chain Performance	H	Pearson Correlation	.533**	.593**	.613**	.615**	.434**	.574**	.526**	1
		Sig. (2-tailed)	0	0	0	0	0	0	0	

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

Source: (SPSS Output, 2022)

Table 10 displays correlation test results for humanitarian supply chain practices and its performance of the humanitarian organization. According to this table, the relationship between *Top Management Commitment* as a key supply chain practices factor and its performance of the humanitarian organization is examined using Pearson Product Movement Correlation Coefficient. Consequently, there is a moderate ($r = 0.533$) positive correlation between the two variables.

In the same approach, the relationship between the *availability of professional Staffs* as a key supply chain practices factor between it and its performance of the humanitarian organization

and contribution of the selected internal practices for humanitarian supply chain practices has also checked. As a result, there is a moderate ($r = 0.593$) positive relationship between those two variables.

The relationship between the integration between *Adequate use of Information Technology* as the selected internal humanitarian supply chain practices and its performance of the humanitarian organization and contribution of the selected internal practices for humanitarian supply chain practices has also examined using Pearson Product Movement Correlation Coefficient. Hence, it is found that there is a moderate ($r = 0.613$) positive relationship between the two variables.

In addition, the relationship between the key internal supply chain practices, *adequate institutional learning practice integration* and its performance of the humanitarian organization and contribution of the selected internal practices for humanitarian supply chain practices is inspected in the same manner. Accordingly, it is revealed that they have also a moderated ($r = 0.615$) positive relationship.

Besides, the relationship between the *Government Factors (Harmonization)* as a key supply chain practices factor between this supply chain practices and its performance of the humanitarian organization and contribution of the selected external practices for humanitarian supply chain practices has also checked. As a result, there is a moderate ($r = 0.434$) positive relationship between those two variables.

In addition, the relationship between the key external supply chain practices, Infrastructural and business strategies and its performance of the humanitarian organization and contribution of the selected external practices for humanitarian supply chain practices is inspected in the same manner. Accordingly, it is revealed that they have also a moderated ($r = 0.574$) positive relationship.

Finally, the relationship between the integration between *Socio-economic situational factors* as the selected internal humanitarian supply chain practices and its performance of the humanitarian organization and contribution of the selected external practices for humanitarian supply chain practices has also examined using Pearson Product Movement Correlation Coefficient. Hence, it is found that there is a moderate ($r = 0.526$) positive relationship between the two variables.

4.7.2 Linear Regression Analysis

Linear regression analysis was used to measure the statistical significance of the effect of each individual independent variable on the dependent variable through F and P value.

4.7.2.1 Assumptions and Diagnostic Test

1) Average value of the errors is zero

The first assumption required is that the average value of the errors is zero; it is assumed that test for average value of the error term is zero ($E(u_t) = 0$); For that reason, since the constant term (constant term i.e. α) was built-in in the regression equation, the average value of the error term in this study is anticipated to be zero.

2) Normality Test Assumption and Result

Table 11 Normality Test Analysis Descriptive Statistics (N=206)

Variables	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Top Management Commitment	-.926	.169	.982	.337
Availability of professional staff	-.441	.169	.406	.337
Adequate use of Information Technology	-.268	.169	.215	.337
Adequate institutional learning practice	-.562	.169	.653	.337
Government Factors (Harmonization)	-.618	.169	-.051	.337
Infrastructural	-.248	.169	.144	.337
Socio-economic situational factors	-.521	.169	.031	.337
Humanitarian Supply Chain Performance	-.394	.169	.157	.337

Source: (SPSS Output, 2022)

Before analyzing this study's data, researcher carefully examined variable distributions. Although this is often done by simply looking over the frequency distributions, there are many, more objective methods of determining whether variables are normally distributed. Characteristically, these involve examining each variable's skewness, which measures the overall lack of symmetry of the distribution, and whether it looks the same to the left and right of

the center point; and its kurtosis, which measures whether the data are peaked or flat relative to a normal distribution. Table 11 demonstrates the descriptive statistic of Kurtosis and Skewness statistics calculation and demonstrates that the distribution is normal because Kurtosis and Skewness are between -2 and +2 interval ranges (Tharenou, et al., 2007).

3) Test for Multicollinearity

As per the definition of Uma (2003), it refers to a situation in which there is exact (or nearly exact) linear relation among two or more of the input variables

Table 12 Multicollinearity Test

		Coefficients ^a	
		Collinearity Statistics	
Model		Tolerance	VIF
1	(Constant)		
	Top Management Commitment	.720	1.389
	Availability of professional staff	.405	2.468
	Adequate use of Information Technology	.339	2.953
	Adequate institutional learning practice	.365	2.740
	Government Factors (Harmonization)	.746	1.340
	Infrastructural	.750	1.333
	Socio-economic situational factors	.677	1.478

a. Dependent Variable: Humanitarian Supply Chain Performance

Source: (SPSS Output, 2022)

Useful research study understanding and experience in using multiple regression analysis, the majority of the studies indicate that if any of the VIF results exceed 5 or 10, it is a suggestion that the connected regression coefficients are unwell estimated because of multicollinearity. There is no strong multi collinearity and degree of association between variables according to the result obtained from the analysis. Table 12 exhibits that the VIF value of four factors was found less than 5 or 10. It can be determined to the fact that no collinearity was observed on this data.

4) Test for Autocorrelation

Assumption that is made of the multiple linear regressions disturbance terms is that the covariance between the error terms over time (or cross-sectionally, for that type of data) is zero.

Table 13 Autocorrelation Test: Durbin Watson

Variables	DW test static result
All variables	1.582

Source: (SPSS Output, 2022)

To test the presence of autocorrelation, the popular Durbin-Watson Test was engaged in this study and found 1.582 as DW test static result. This assumed that the errors are uncorrelated with one another. It would be stated that they are “auto correlated” or that they are “serially correlated” if the errors are not uncorrelated with one another. A test of this assumption is therefore required.

4.3.1 Regression Test Result

Table 14 Regression results Model Summary

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.820 ^a	.672	.660	.338

a. Predictors: (Constant), Socio-economic situational factors, Adequate institutional learning practice, Government Factors (Harmonization), Infrastructural , Top Management Commitment , Availability of professional staff, Adequate use of Information Technology

Source: (SPSS Output, 2022)

This measurement is made by inferring the value of R^2 to explain the magnitude of the effect of the independent variable on the dependent variable. At this time underneath portrayed and explained are the linear regression of various independent variables and dependent variable. As shown in the above table, the overall bundle of determinant factors of the seven independent variables were 67.2 % ($R^2 = .672$) explained the dependent variable (performance). This suggests that 67.2 % of supply chain performance level in the humanitarian clearly depends on the supply chain practices or independent variables while the remaining less than 32.7 % is determined by other unaccounted factors in this study.

Table 15Regression results ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.152	7	6.593	57.860	.000 ^b
	Residual	22.562	198	.114		
	Total	68.715	205			

a. Dependent Variable: Humanitarian Supply Chain Performance

b. Predictors: (Constant), Socio-economic situational factors, Adequate institutional learning practice, Government Factors (Harmonization), Infrastructural , Top Management Commitment , Availability of professional staff, Adequate use of Information Technology

Source: (SPSS Output, 2022)

As the second table shows the result $F= 57.860$; it can be concluded that the combination of determinant factor have positive effect on supply chain performance which is statistically significant. Thus, this study rejects the null hypothesis.

Source: (SPSS Output, 2022)

Table 16Regression Test Coefficients Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.242	.178		1.356	.177
	Top Management Commitment	.153	.038	.193	4.025	.000
	Availability of professional staff	.098	.054	.116	1.811	.002
	Adequate use of Information Technology	.122	.061	.139	1.988	.048
	Adequate institutional learning practice	.155	.062	.168	2.499	.013
	Government Factors (Harmonization)	.083	.037	.106	2.257	.025
	Infrastructural	.215	.038	.267	5.676	.000
	Socio-economic situational factors	.142	.033	.212	4.287	.000

a. Dependent Variable: Humanitarian Supply Chain Performance

Source: (SPSS Output, 2022)

From the above multiple regression table, we can effortlessly compare the relative contribution of each of the different variables by taking the beta value under the unstandardized coefficients. The higher the beta value, the stronger its contribution becomes. Accordingly, the study found that infrastructure and performance (Beta=.267) makes the strongest unique contribution to explaining the dependent variable. The result revealed that, a one-unit effort increase or positive change in supply chain performance would lead to a 0.267 unit increase in the level of infrastructure and followed Socio-economic situational factors (B=.212).

When we understand the statistical significance, each variable from the above coefficients table indicates that there is there is a positive and significant effect between *Top Management Commitment* as a key supply chain practices factor and its performance of the humanitarian organization is investigated using Multiple Regression. Consequently, there is a positive and significant effect ($r = 0.0001$) between the two variables.

In the same approach, *availability of professional* as a key supply chain practices factor between SHRM practices has positive and significant effect on performance of the humanitarian organization. As a result, there is a moderate ($r = 0.002$) positive relationship between those two variables.

This study found that *Adequate use of Information Technology* as the selected internal humanitarian supply chain practices has positive and significant effect on supply chain performance of the humanitarian organization and contribution of the selected internal practices for humanitarian supply chain practices. Hence, it is found that there is positive and significant effect ($r = 0.048$) positive the two variables.

In addition, the key internal supply chain practices, *adequate institutional learning practice integration* has positive and significant effect on supply chain performance of the humanitarian organization. Accordingly, it is revealed that it has positive and significant effect on dependent variable ($r = 0.013$).

Besides, *Government Factors (Harmonization)* as a key supply chain practices factor between positive and significant effect on its performance of the humanitarian organization. As a result, there is a positive and significant effect of it on performance ($r = 0.025$).

In addition, the key external supply chain practices, Infrastructural and business strategies has positive and significant effect on its performance of the humanitarian organization. Accordingly, it is revealed that it has positive and significant effect on supply chain performance ($r = 0.0001$).

Finally, *Socio-economic situational factors* as the selected internal humanitarian supply chain practices have positive and significant effect on its performance of the humanitarian organization. Hence, it is found that it has positive and significant effect on supply chain performance ($r = 0.0001$).

4.4 Discussion

This study used correlation and multiple regression analysis to meet the objective of the study. The result indicated that the relationship between Top Management Commitment and humanitarian supply chain performance ($r = 0.533$); positive correlation between the two variables. In addition, it applied regression analysis and it found that Management Commitment has a positive and significant effect on supply chain practices performance of the humanitarian organization ($r = 0.0001$). Decision makers play an important role in the understatement of the external environment (Abidi et al., 2014). It may have an active role in the entire competitive intelligence process, participation and influence

In the same approach, *availability of professional* as a key supply chain practices factor between SHRM practices has positive and significant effect on performance of the humanitarian organization using regression analysis. Before the regression analysis, it was found that there is a moderate ($r = 0.002$) positive relationship between those two variables. Anthony (2016) suggests that there are at least two main constraints limiting the information gathering process and the analysis of business environment data: perception and skills. The capability of the company and the supply chain in adjusting with changes in a short time and the flexibility and endeavors of suppliers, production system, distribution channels, transportation methods, and multi-skill personnel.

This study found that *adequate use of Information Technology* has positive and significant effect on supply chain performance of the humanitarian organization and contribution of the selected internal practices for humanitarian supply chain practices. The relationship between the integration between *Adequate use of Information Technology* and its performance of the humanitarian organization and contribution of the selected internal practices for humanitarian supply chain practices has also examined and found that there is a moderate ($r = 0.613$) positive

relationship between the two variables. Gary (2014) stated that humanitarian relief organizations have a common need for incorporated information technology (IT) solutions that support procurement, distribution through a pipeline, tracking and tracing of goods and funds, flexible and robust reportage, and connectivity in the field. For example, Abidi et al., (2014) stated that procurement involves global sourcing, drop shipment, using commercial transportation and third-party logistics firms, chartering aircraft or procuring local transportation such as mules and donkeys, tracking shipments, and monitoring prices for commodities around the world.

In addition, it is revealed that it has positive and significant effect on dependent variable ($r = 0.013$). In addition, the relationship between the key internal supply chain practices, *adequate institutional learning practice integration* its performance of the humanitarian organization is reviewed in the same manner. Accordingly, it is revealed that they have also a moderated ($r = 0.615$) positive relationship. In view of that, the key internal supply chain practices, *adequate institutional learning practice integration* has positive and significant effect on supply chain performance of the humanitarian organization. Anthony (2016) suggests whereas affecting relief items to disaster sites will continue to be a significant role for logistics, the strategic focus must be on providing timely information, analyzing that information to garner insight as to how to improve operations, and learning internally and with others. Inaugurating a community that shares and invests jointly in advancing the field can leverage each logistician's efforts many-fold.

Besides, the relationship between the *Government Factors (Harmonization)* and its performance of the humanitarian organization practices has also checked. As a result, there is a moderate ($r = 0.434$) positive relationship between those two variables. Further, *Government Factors (Harmonization)* as a key supply chain practices factor between positive and significant effect on its performance of the humanitarian organization. As a result, there is a positive and significant effect of it on performance ($r = 0.025$). Magadi and Noor (2017) asserted that local transportation, warehousing and distribution have to be organized when supplies arrive. This is a marvellous achievement to accomplish, given the remote places in which disasters tend to occur, the individuality of the requirements for each disaster in terms of both expertise and goods, and the fact that the disaster site is often in a state of chaos. Due to lack of physical infrastructure such as roads, bridges and airports, government must frequently participate in coordination efforts of NGOs activities, may be severely impacted, or even uprooted in the case of a conflict situation as transport capacity may be extremely limited, or non-existent (Gary, 2014).

In addition, the relationship between the key external supply chain practices, infrastructural and its performance of the humanitarian organization is inspected in the same manner. Accordingly, it is revealed that they have also a moderated ($r = 0.574$) positive relationship. Furthermore, the key external supply chain practices, Infrastructural and business strategies has positive and significant effect on its performance of the humanitarian organization. Accordingly, it is revealed that it has positive and significant effect on supply chain performance ($r = 0.0001$). Ngonidzahe & Micheline (2016) found a need for developing flexible technology solutions will improve responsiveness by creating visibility of the materials pipeline and increasing the effectiveness of people and processes. Additionally, advanced information systems will create the infrastructure for knowledge management, performance measurement and learning (Magadi and Noor, 2017).

Finally, the relationship between the integration between *Socio-economic situational factors* and its performance of the humanitarian organization has also examined using Pearson Product Movement Correlation Coefficient. Hence, it is found that there is a moderate ($r = 0.526$) positive relationship between the two variables. As a final point, *Socio-economic situational factors* as the selected internal humanitarian supply chain practices have positive and significant effect on its performance of the humanitarian organization. Hence, it is found that it has positive and significant effect on supply chain performance ($r = 0.0001$). Anthony (2016) found the need for situational factors like 'service time', 'worldwide service', 'positioning', 'goods variety'; and 'reputation', 's infrastructure' etc from humanitarian organization were chosen as reasons for supply chain performance.

CHAPTER FIVE

SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings of the study. It has particularized the summary and major findings from the analysis and has produced the presentation in detail. The researcher suggests the possible recommendations and conclusions that has summarized and concluded the research study.

5.2 Summary of Major Findings

This study found that

- There is a good humanitarian supply chain practice in IMC Ethiopia (in terms of procurement, warehouse, transportation and information and communication); among the five practices procurement has been superior but transport practices have been found unsatisfactory
- Higher humanitarian supply chain performance of IMC Ethiopia was found particularly towards flexibility of humanitarian supply chain performance
- *Top Management Commitment* ($r = 0.0001$), **availability of** ($r = 0.002$), *Adequate use of Information Technology* ($r = 0.048$), *adequate institutional learning practice integration* ($r = 0.013$), *Government Factors (Harmonization)* ($r = 0.025$), *Infrastructure* ($r = 0.0001$) and *Socio-economic situational factors* ($r = 0.0001$) were found a key factors affecting the humanitarian supply chain performance in IMC Ethiopia.

5.3 Conclusions

This study concluded effective humanitarian supply chain practice needs for higher supply chain performance in humanitarian organizations. There is a good humanitarian supply chain practice in IMC Ethiopia (in terms of procurement, warehouse, transportation and information and

communication); among the five practices procurement has been superior but transport practices have been found unsatisfactory. Higher humanitarian supply chain performance of IMC Ethiopia was found particularly towards flexibility of humanitarian supply chain performance. Thus, it needs the following to enhance humanitarian supply chain performance: top management commitment, availability of , adequate use of information technology, adequate institutional learning practice integration, government factors (harmonization), infrastructure and socio-economic situational factors. They were found key factors affecting the humanitarian supply chain performance in IMC Ethiopia.

5.4 Recommendations

- This study found that transportation pipelines were bottlenecked in Ethiopian humanitarian supply chain practices, thus, this study suggests it needs a Supply chain and logistics conferences to create an efficient and cost-effective flow and storage of goods and materials for the purpose of alleviating the suffering of vulnerable people, came of age during higher level disaster relief effort.
- This study suggests Humanitarian supply chain should be a central to disaster relief actions to an effective and speed of response for major humanitarian programs, such as health, food, shelter, water, and sanitation.
- Humanitarian organization should involve in enhancing and supporting small scale Physical infrastructure such as roads, bridges and landing fields development. . National and local government, through which humanitarian organizations must synchronize their activities, may be severely impacted, or even uprooted in the case of a conflict situation.
- The concept of resilience in supply chain should be widely recognized as it is related to the supply chain conformance capability to decrease sudden disruptions and resistance against the extending of the disruptions through controlling structures and operations, retrieving and reflecting by emergency reactive and effective plans. The supply chain capability in accelerated returning to sustainable operational condition can also be referred to, which can positively influence business performance
- It needs to create a professional humanitarian logistics community that will enable

humanitarian logisticians to share knowledge and experience on common issues and to create a consistent, powerful voice with all the stakeholders in the sector.

5.5 Future Studies

This study calls for advanced information systems study including the need for infrastructure for knowledge management, performance measurement and learning. It needs to review the managing practices of humanitarian response, and coordination efforts towards humanitarian supply chains, procurement, warehousing and inventory management, transport, fleet management and import/export procedures.

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ANNEX

APPENDIX A: Questioner

**ADDIS ABABA UNIVERSITY, COLLEGE OF SCHOOL OF COMMERCE,
GRADUATE STUDIES, DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN
MANAGEMENT**

(TO BE FILLED BY INTERNATIONAL MEDICAL CORPS STAFFS)

Dear respondents, I'm a graduate student at Addis Ababa University College of Commerce in the Department of Logistics and Supply Chain Management. Currently, I'm conducting a research entitled 'Humanitarian Supply Chain practices and Factors affecting its performance of International Medical Corps in Ethiopia as a partial fulfillment of the requirements for the Degree of Master of Arts in Logistics and Supply Chain Management, Addis Ababa University, School of Commerce.

The purpose of this questionnaire is to gather a primary data for the proposed study, and hence you are kindly requested to assist the successful completion of the study by providing the necessary information. Your participation is entirely voluntary, and the questionnaire is completely anonymous. I confirm you that the information you share will stay confidential and only used for the aforementioned academic purpose. So, your genuine, frank, and timely response is vital for the success of the study. I want to thank you in advance for your kind cooperation and dedication of your precious time to fill this questionnaire.

Instruction: No need of writing your name.

- Indicate your answer with a check mark (√) or (X) on the appropriate block/cell for all questions.
- If you need further explanation, please contact me and discuss the matter freely at (Telephone No. +251-911 309800, E-mail netsiyir@gmail.com)

Sincerely yours, Netsanet Yirdaw

Part I: General Information.

This part of the questionnaire, intended to gather general information about the background of the respondent and the organization.

Sex	Female	<input type="checkbox"/>	Male	<input type="checkbox"/>				
Age	under 30 Years	<input type="checkbox"/>	31-40 Years	<input type="checkbox"/>	41 – 50 Years	<input type="checkbox"/>	above 51 Years	<input type="checkbox"/>
Education	Diploma	<input type="checkbox"/>	First Degree (BSc, BA)	<input type="checkbox"/>	MA and above	<input type="checkbox"/>		
Years stayed at the organization: (IMC)	Less than 1Year	<input type="checkbox"/>	1-5 Years	<input type="checkbox"/>	6-10 Years	<input type="checkbox"/>	Over 11 Years	<input type="checkbox"/>
How long have you been working in humanitarian sector?	Less than 1Year	<input type="checkbox"/>	1-5 Years	<input type="checkbox"/>	6-10 Years	<input type="checkbox"/>	Over 11 Years	<input type="checkbox"/>

Part II: Assessment of humanitarian supply chain practice of IMC Ethiopia

Please indicate your choice by putting a tick mark (√) on the appropriate cell.

Where, 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

Please indicate the degree to which you agree with the following statements regarding the humanitarian supply chain practices of International Medical Corps Ethiopia program

A	Procurement Practice	1	2	3	4	5
1	IMC procurement request (PR) clearly identifies need/demand to be procured.					
2	All PR is processed through threshold as per IMC manual					
3	Supplier selection of IMC Ethiopia is focused on price and specification.					
4	Purchase Order /service agreement / contract is respected by supplier and IMC					
5	IMC Ethiopia has a good and long run relationship with the suppliers					
6	All requested items or service are delivered with in required time and date					
B	Warehouse Management Practice					
1	IMC Ethiopia has sufficient and appropriate warehouse to temporarily store supplies					
2	IMC Ethiopia's warehouse location is very accessible for distribution					
3	IMC Ethiopia uses warehousing as a facilitator for coordination, sorting, and packaging activities for easier and efficient aid delivery to the beneficiaries					
4	IMC Ethiopia's warehouse is situated in a manner to improve material distribution operation					
C	Transportation Practice					
1	IMC Ethiopia uses all modes of transportation available for the movements of supplies					
2	Third party transport companies are cooperative to IMC Ethiopiaduring emergencies to transport supplies/items.					
3	IMC Ethiopia delivers relief supplies to where they are required during emergencies.					

4	There are sufficient transport companies that provide transportation services for emergency works with IMC					
5	There is a prequalified list of transport companies for IMC to choose from during emergencies					
6	IMC uses various transport optimization models to deliver supplies with the least cost possible					
D	Information and Communication Practice					
1	Having of full information and good communication between the supply chain staffs (such as head office, primary distribution point and operational Woredas)					
2	Information exchange between the organization and key 3rd party logistics /transporters and other partners in timely and accurate manner.					
3	IMC Ethiopia has system to communicate all supply chain staff in AA and field office.					
4	Good communication and coordination between supply chain of the programs with other departments (such as finance and logistics)					

Part III. Factors affecting the Humanitarian Supply Chain Performance of IMC Ethiopia

Please indicate the degree to which you agree with the following factors affecting the humanitarian supply chain performance of International Medical Corps Ethiopia

No.	Organizational Internal Factors	SCOR				
A	Top Management Commitment	1	2	3	4	5
1	IMC Ethiopia has top management commitment to provide training to supply chain staff					
2	IMC Ethiopia has top management commitment to allocate resource to supply chain staff					
3	IMC Ethiopia has top management commitment to provide timely decision for supply chain staff request.					
B	Availability of professional staff	1	2	3	4	5
1	IMC supply chain performance affected by availability of a trained and experienced supply chain staffs which resulted from the poor recruiting mechanism.					
2	IMC supply chain service performance affected by the limitation of hiring enough supply chain staffs.					

3	The consistency in application of the supply chain procedures by all staffs affected the supply chain performance.					
C	Adequate use of information Technology					
1	IMC Ethiopia has well designed supply chain process enabler information technology system					
2	IMC Ethiopia has own system/data base to communicate /share information for supply chain department in HO (head office)& FO (field office)					
3	Quality and speed of information flow in IMC is up to the standard.					
D	Institutional learning practice					
1	IMC has conducive environment to learn and knowledge sharing with in the organization and other NGOs					
2	Supply chain staffs attend training and development workshops continuously					
3	IMC has access to necessary supply chain online courses with certification					
External Factors		SCORE				
A	Governmental Situational Factors					
1	Availability of joint planning practice with other partners when setting the supply chain planning affects the supply chain performance of IMC					
2	An overall inter-agency coordination and collaboration in humanitarian supply chain affects the organization operational performance.					
3	Assistance from the government bodies affects the organization's humanitarian operation performance.					
4	Government restrictions or bureaucracy in the supply chain affected the supply chain performance of IMC					
B	Infrastructure situational Factors					
1	Availability of all-weather alternative roads negatively affected the delivery of relief (aid) goods to the beneficiaries.					
2	Adequate ICT networking infrastructure affect the performance of the organization supply chain service.					
3	Availability of warehouses at the project office areas and near beneficiary locations affect the supply chain performance of IMC					
C	Socio-economic Situational Factors					
1	Cultural restrictions or norms affect IMC Humanitarian supply chain performance.					

2	Ability of local suppliers to understand purchase request or purchase order or specifications affect IMC supply chain operational performance.					
3	The reliability of local suppliers affects the organization's supply chain operational performance.					
4	Availability of quality goods in local market affects the organization's supply chain operational performance.					
5	Potential local suppliers affect the organization supply chain operational performance.					

Part IV. Determine humanitarian supply chain performance of IMC Ethiopia

Please indicate the degree to which you agree with the following statements regarding the humanitarian supply chain performance of International Medical Corps Ethiopia program

	Humanitarian supply chain performance of IMC	SCORE				
A	Reliability of Humanitarian Supply Chain Performance	1	2	3	4	5
1	The right supplies are delivered by IMC Ethiopia in the right quantity with all the necessary documentation for a demand requested					
2	IMC Ethiopia fulfils all the requested demands.					
3	All the supplies are delivered at the right time inorder that beneficiaries are properly aided byInternational Medical Corps.					
4	The supplies delivered by IMC Ethiopia are in a damage free state with the correct configuration and hence return or replacement is required					
5	Warehouse units distribute all the procured goods at the correct quantity and with the correct documentation					
6	Warehouse implements modern filling system that enables it to easily provide any information upon request.					
7	The transport unit controls the transporters for the delivery of the goods to project offices without delay.					

8	The fleet management has a mechanism to ensure the safe arrival of all the shipped goods both in terms of quality and quantity.					
9	There is frequent information communication interruption in IMC that affects the supply chain function.					
10	Adoption of ICT improves the supply chain service in documentation accuracy.					
B	Flexibility of Humanitarian Supply Chain Performance					
1	The procurement system is easily adaptable to accommodate quantity adjustment after placing order					
2	The existing procurement practice helps to continuously develop strategy based on maintaining a good relationship with its major suppliers to ensure the timely delivery of urgent and unplanned requests.					
3	IMC warehouse management system allows quick and easy mapping for unexpected goods shipping request.					
4	Warehouse smoothly distributes goods to multiple projects correctly as per the provided information.					
5	Fleet is flexible enough to accommodate unexpected and sudden increases and decreases in freight volumes than the initially requested quantity					
6	Fleet has a capacity to negotiate with transport service provider for timely replacement of damaged rental vehicles.					
7	Exchange of information takes place frequently, informally and/or in a timely manner.					
8	The ICT implementation improves the ability of the supply chain to rapidly adjust its capacity in response to customer demand.					
C	Responsiveness of Humanitarian Supply Chain Performance					
1	All requested demands are delivered at the righttime, place, quantity, and quality.					

2	Warehouse timely report the status of the delivered goods to the users and suppliers and take necessary action on damaged or lost goods.					
3	Warehouse proactively sends information to project offices about shipment of goods as it dispatched from country office.					
4	IMC has sufficient transporters who can respond for urgent transport needs for the transportation of commodities from country office to projects					
5	IMC transport service providers are capable enough to respond for the organization urgent transport need in short notice.					
6	Adopting ICT in IMC increases the timely information sharing with project offices in all supply chain processes.					
7	The ICT system increases the performance of the supply chain by improving up the delivery speed.					

Open ended question

In your opinion, is there any other factor/s affecting the Humanitarian Supply Chain performance of IMC - Ethiopia and what do you think should be done to improve the performance?

Thank you!

Appendix B: Interview

Dear Supply Chain operations department head/Coordinator, ...

Whilst I fully appreciate how busy you must be, I will pose short interview questions of what are, hopefully straightforward questions which I trust that you will be able to find the time to answer. This interview is for an academic purpose - for a partial fulfillment of master's degree on logistics and supply chain management. The study is on practice, challenges and Factors affecting humanitarian supply chain performance- the case of International Medical Corps (IMC) - Ethiopia. The nature of this interview is of open and closed ended. My aim at present is to establish some preliminary data; once I have analyzed this data my intention will be to conduct more in-depth research into the trends and issues raised. I will be happy for you to review my findings as and when they become available.

Please feel free to ask when you need further clarifications and answer only what you know and comfortable with. The interview will not take more than thirty minutes.

With many thanks in anticipation.

Yours faithfully,

1. Please briefly introduce yourself and how long you have been working in the organization and specifically in your current position?
2. How well are humanitarian supply chain performance is reliable(meet consistent performance, Flexible(having of capability to provide goods/service to beneficiaries) and responsiveness(ability to respond wide rag of quantity demand, meet short lead times, high service level...)?
3. What do you say about humanitarian supply chain practice in IMC?
4. Do you have stable information communication technology for SC functions? And what is the backup software system when internet data are off?
5. Are there formal and/or informal complaints presented to you on the supply chain function operations from programs? If so, which are the major ones?
6. What were the difficulties and barriers for humanitarian supply chain performance in IMC - Ethiopia?

7. How could humanitarian supply chain performance be mitigated or improved in the organization?
8. Anything you want to add?