



**FACTORS AFFECTING THE HUMANITARIAN SUPPLY CHAIN MANAGEMENT
PRACTICES OF BIRHAN FOR MOTHERS AND CHILDREN MORBIDITY AND
MORTALITY SURVEILLANCE ETHIOPIA PROGRAM**

By

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I, Daniel Wassie, hereby declare that thesis entitled: “Factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program” is my own original work and that it has not been presented and will not be presented to any other Diploma or fellowship award and all the sources of materials used for the thesis have been duly acknowledged.

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Abstract

The goal of humanitarian Supply Chain Management is to minimize the human suffering, in particular to prevent further loss and damage to people, as well as to treat people with injuries and illnesses immediately.

This study is carried out to assess the existing humanitarian supply chain management practices and identify factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.

A census survey focused on the operations department by deploying questionnaires. The researcher used structured questionnaires to collect data. of the 74 questionnaires distributed ,65 questionnaires were corrected and presented to the SPSS data analysis tool for statistical testing. A descriptive and explanatory research design was used to describe and analyze factors those affecting the humanitarian supply chain management practices of BIRHAN for mother and children. Descriptive statistics was used to explain the profile of the respondents and to discuss responses of the respondents on humanitarian supply chain management practices by measuring mean and standard deviation. Research questions also tested by using statistical analysis of multiple linear regressions and K.W Coefficient analysis model. The finding shows that humanitarian supply chain management practices such as sourcing/ procurement, inventory management, transportation, warehouse /facility location and distribution management were properly practiced. The multiple regression result has shown that earmarking of fund, lack of skilled human resource and lack of supply chain relationship are negatively and significantly affecting humanitarian supply chain management practices BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program. Hence in order to achieve better humanitarian Supply chain management practices BIRHAN for mothered and children should work on the three constructs. However, demand uncertainties, lack of information technology adoption and degraded infrastructure have been reported to be less important, so this study invites future researchers to investigate whether this variable has no a significant impact on humanitarian supply chain management practice.

Key words: *Humanitarian supply chain management practices, factors affecting HSCMP, BIRHAN for mother and children*

ABBREVIATIONS AND ACRONYMS

CBA: Comparative Bid Analysis

DMTP: Disaster Management for Training Program

DN: Delivery Notes

GRN: Goods Received Note

HROs: Humanitarian Relief Organizations

HSCMP: Humanitarian Supply Chain Management practices

IFRC: International Federation of the Red Cross and Red Crescent Societies

NGOs: Non-Governmental organizations

PO: Purchase Order

PR: Purchase Request

PVOS: Private Voluntary Organizations

RFQ: Request for Quotations

SCM- Supply chain management

UNICEF: United Nations Children's Fund

WaSH: Water, Sanitation and Hygiene

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CHAPTER ONE

INTRODCUCTION

In this chapter a brief background of the study, statement of the problem, research objectives, and research questions/hypothesis, scope of the study, definition of terms, significance of the study, and organization of the study are presented.

1.1 Background of the study

A disaster is any event responsible for a breakdown in the normal functioning of a community that also overwhelms local response capability (PAHO,2004 and PAHO,2001). Whether natural or man-made disasters, all disasters share great human suffering. without the mobilization of relief missions from countries around the world, the cumulative damage would be much worse.

Emergency relief involves many of the same logistics processes applied in the private sector, but modern logistics practices have only newly been applied to disaster relief and recovery. Humanitarian logistics is slowly developing as its own discipline within supply chain and logistics management. Thomas (2003) explains that “Humanitarian logistics refers to the processes and systems involved in mobilizing people, resources, skills, and knowledge to help vulnerable people affected by natural disasters and complex emergencies.”

In humanitarian emergency logistics too, managers need to recognize that the value of time is more important than the value of transportation, that is, getting help quickly is more important than wasting time on cheaper and slower modes of transportation. Logistics is critical able to assess demand and rapid mobilization of personnel, equipment, and materials in response. “Inventory management in relief operation is unique in that the time value of the commodities are much greater than the inventory carrying costs. Having the food available and moving it as rapidly as possible is much more important than holding minimal stock levels” (Long and Wood, 1995).

A lot of governmental, non-governmental (NGO) and private company provide manpower, cash and raw materials to help disaster victims. “The number of disparate actors involved in providing humanitarian assistance complicate efforts to improve coordination” (Byman, 2000). Organizations with different skills and specializations provide different levels of support and sometimes create inefficiencies through duplication of work. “The heads of logistics tend to each fight their own battles with little collaboration” (Thomas,2003).

To this end the study focused on identifying factors affecting the humanitarian supply chain practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.

1.2 Problem Statement

With the proven fact that supply chain tasks for the humanitarian aid and disaster relief sector are the most important topic for developing and implementing a successful humanitarian supply chain strategy, as logistics and the supply chain are the backbone and most expensive part of any relief operation. Assessing the factors affecting the supply chain has become critical to all organizations involved in humanitarian aid response program, so the research reveal theoretical and observational gaps to clarify and substantiate the need and relevance of the proposed study.

The humanitarian landscape in 2019 was characterized by adverse situations including displacements caused by inter-ethnic conflict and violence, drought conditions leading to food insecurity, unseasonal rainfall causing flooding, disease outbreaks and desert locust infestations. At the beginning of the year, 8.3 million people were identified as requiring food and non-food assistance which quickly grew to 8.6 million before mid-year due to increasing conflict-related displacements. Floods and disease outbreaks exacerbated the already dire humanitarian situation (Gov't of Ethiopia, OCHA, 2017).

The year 2019 seen frequent incidences of inter-communal conflicts and clashes between Government forces and unidentified armed groups in various pocket areas across the country with southern and western Oromia being the worst hit. Conflicts and violence caused the internal displacement of some 3.2 million people in the country starting from late 2018. Although many of the displaced people returned to their places of origin following the Government's return and rehabilitation strategy in April 2019, most remained secondarily displaced either for fear of reprisal attacks or as their homes have mostly been damaged or destroyed. The situation still remains fragile in communities that were affected by communal conflict particularly in Western and Southern Oromia, parts of Amhara and areas bordering with Tigray region, Benishangul Gumuz and Dire Dawa City Administration (Gov't of Ethiopia, OCHA, 2017).

Desert locust infestation, which was reported to be the worst to hit the Horn of Africa countries in 25 years, affected and continue to threaten a further reduction of the meher harvest in Ethiopia. According to official reports, up to late 2019, locusts infested an estimated 2,350 km² in more than 125 woredas in Somali, Amhara, Tigray, Oromia and SNNP regions since the infestation started

in June 2019. In affected localized areas, households harvested immature crops to avoid large-scale crop losses. In pastoralist areas of Afar, Oromia and Somali regions, locusts destroyed vast areas of grazing land and vegetation, which deteriorated pasture availability for livestock. Desert locusts are expected to continue hatching in areas where conditions are largely favorable for breeding, such as in Somali region. While efforts to scale up major control operations are ongoing, crop and pasture losses – yet to be quantified – have been registered with the compounding severe threat to the livelihoods of households in the affected localities (Gov't of Ethiopia, OCHA, 2017). In addition, Ethiopia remains vulnerable to epidemic outbreaks where cholera remains one of the major public health hazards throughout the country. As of mid-November 2019, nearly 2,000 cases of cholera were reported in Ethiopia from almost all regions. Other epidemics in 2019 in Ethiopia include measles, polio, malaria and chikungunya. As of November 2019, nearly 9,000 suspected measles cases were reported from Afar, Amhara, Oromia, SNNP and Somali regions, including among adults up to 45 years of age while over 53,000 suspected cases of chikungunya were reported in Dire Dawa City Administration and Afar region; polio outbreaks were reported in Oromia and Somali regions, during the year (Gov't of Ethiopia, OCHA, 2017).

There is also evidence of a growing number of natural disasters and man-made conflicts in Ethiopia, affecting millions of people each year. Despite this fact, the study of humanitarian supply chain management is still not well developed and there is little published work that improves the understanding of the nature of supply chain management for humanitarian agencies operating in Ethiopia.

Research on humanitarian supply chain management for non-profit organizations operating in Ethiopia is limited and not widely disseminated. Thus, the fact that a researcher cannot find this kind of research in this area is certainly the fundamental reason for the rationale for conducting this research.

1.3 Research Objective

1.3.1. General Objectives

The general objective of this research is to assess factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance program in Ethiopia.

1.3.2. Specific Objectives

The specific objectives of this study are:

- To assess the existing humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.
- To identify factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.

1.4 Research Question/Hypothesis

- How the humanitarian supply chain management is being practiced at BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program information technology affects the supply chain management of the organization?
- What are the major factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program?

1.5 Scope of the Study

The scope of study is limited to the conceptual framework i.e., factors affecting humanitarian supply chain management practices, Geographically the scope is limited to the headquarters of BIRHAN for mothers and children morbidity and mortality Ethiopia program, one of the leading international humanitarians the selected organization for this study are Addis Ababa head office of the program and Amhara regional State (north showa zone, the Kewet and Angollola wereda). They are found at about 225 km and 131 Km northeast of Addis Ababa respectively). It also only focuses on fixed term contracts i.e., it does not include temporary, intern, consultants or on-call contracted because it will be beyond the capacity of this research to cover all the employees that are employed based on contract.

The scope for research methodology will be limited to descriptive and explanatory method. To conduct this research the time dated for this study covered from November 2020 till the end of July 2021.

Demand Uncertainty:

“...disasters are the embodiment of randomness. You don’t know when they’re going to happen, where it’s going to happen, and who’s going to be affected. This is ultimate execution of a sophisticated supply chain, particularly from an algorithmic planning basis. Every other supply chain is based on predictability” (Sowinski, 2003).

Information Technology Adoption: Telecommunications and computer technology allow all the actors in the supply chain to communicate among each other. The use of information technology

allows suppliers, manufacturers, distributors, retailers, and customers to reduce lead time, paperwork, and other unnecessary activities. It is also mentioned that managers will experience considerable advantages with its use such as the flow of information in a coordinated manner, access to information and data interchange, improved customer and supplier relationships, and inventory management not only at the national level but also internationally (Handfield and Nichols, 1999).

Degraded Infrastructure: inadequate transportation and communication infrastructure is another barrier to effective delivery of aid. In the United Nations Disaster Management Training Program (DMTP) logistics handbook, it states “the overall effectiveness of relief logistics often depends on the level of prior investment in both the transport and communication infrastructure and how far relief requirements have been considered in the planning” (DMTP, 1993).

Earmarking of Funds: According to Thomas, (2003) donor scrutiny over the usage of funds, concern that contributions flow directly through to beneficiaries combined with earmarking of donations for particular relief operations, drives HROs (humanitarian relief organizations) to focus on direct relief rather than investing in systems and processes that will reduce expenses or make relief more effective over the long-term. Thus, operational disaster response approaches are encouraged by the funding mechanism and strategic disaster preparedness opportunities are discouraged. This results in an underinvestment in infrastructure such as information systems and warehousing facilities, and a reluctance to preposition inventory to improve responsiveness.

Supply chain relationships: It play an important role in achieving the organization’s goals. The coordination and integration of activities with suppliers and understanding of customer’s needs results in greater benefits for companies. Strategic supplier partnerships and customer relationships are main components in the supply chain management practices (*Li et al., 2005*), leading to information sharing, which is one of the five pillars in achieving a solid supply chain relationship (Lalonde, 1998). Two sub-factors are considered in the model relationship with suppliers and customers.

1.7 Significance of the study

Even though researchers have immensely contributed to the field of factors that affecting the supply chain management is not well known, the concept of demand uncertainty, information technology, budget, supply chain relationship in humanitarian relief logistics remain in its infancy and requires further investigation.

In this regard, the contribution of this study will be the effort of developing the newly emerging framework for the relief chain sectors and to existing theories will have paramount importance. Since this research is designed to assess the factors that affect the supply chain management of the humanitarian organization operation, the result will be beneficiaries to humanitarian organizations. Currently executing emergency mothers and children morbidity and mortality surveillance programs in particular and others humanitarian organizations implementing relief operations in general was considered.

In Ethiopia, the study of humanitarian supply chain management has not sufficiently been studied. The result will be an opportunity to gain deep knowledge in the concepts of effecting of supply chain management in humanitarian relief logistics in Ethiopia. Furthermore, this research can serve as steppingstone for other researchers who want to explore about it.

1.8 Organization of the Paper

The research report is organized into of five chapters. The first chapter would focus on introductory aspects like background of the study and the organization, statement of the problem, research questions, objective of the study, Scope of the study and significance of the study. Chapter two presents the literature review, which served as a basis for understanding the subject matter. Chapter three focuses on the methodology of the study. Chapter four concentrated on the presentation and analysis of data obtained from responses. The fifth chapter presents summary, conclusions along with possible recommendations

CHAPTER TWO

REVIEW OF RELATED LITERATURE

The literature review will identify the key requirements for the preliminary stages of emergency response, analyze obstacles to efficient relief logistics, and recommend solutions to those barriers. This chapter concludes with an overview of the current practices of a number of emerging humanitarian organizations and summarizes the literature review, including a theoretical and empirical overview of supply chain management in humanitarian relief logistics.

2.1. Theoretical Literature Review

2.1.1. Concept of Supply chain management Practices

The concept of Supply Chain Management is inevitable for efficient resource utilization in the modern organization. *Chopra et al. (2010)* portend that supply chain management represent the confluence of at least three main streams of knowledge and practical experience of the business world spanning almost 60 years. The fusion of these streams into one powerful movement, supply chain management, that is sweeping across the present-day individual world has brought about by intense competition characteristic of the contemporary markets. They identify three disciplines in supply chain management as: (a) sourcing, procurement, and supply management; (b) materials management; and (c) logistics and distribution.

It is apparent that much of the focus in the increasingly voluminous literature on supply strategy, operations strategy and supply chain management is directed at meaning making. Often this comprises assertions about what it essentially “is”. The precepts of SCM as currently portrayed are a mixture of three elements: description, prescription, and the identification of alleged trends. Description Debates here relate to scope and focus. Some academics openly declare that they use the terms supply chain management and purchasing “synonymously” (Lysons & Farrington, 2006). Giunipero, Handfield, Monczka, & Petterson (2009) hold that supply chain management endorses a supply chain orientation and involves proactively managing the two-way movement and coordination of goods, services, information, and funds (i.e., the various flows) from raw material through end user. The study looks at Supply Chain Management in two perspectives including: resource-based view and operational excellence. The perspectives are discussed as follows:

Resource-based view Supply Chain Management (SCM) is an essential element to operational efficiency. SCM can be applied to customer satisfaction and organization’s success including

NGOs. SCM impacts on effective resource utilization and realization of organization goals and objectives. Supply chain management helps streamline everything from day-to-day product flows to unexpected natural disasters. With the tools and techniques that SCM offers, you will have the ability to properly diagnose problems, work around disruptions and determine how to efficiently move products to those in a crisis. NGOs require properly instituted SCM with minimal bottlenecks. Proponents of Resource-based view see SCM as a basis for the competitive advantage of a firm, lying primarily in the application of a bundle of valuable tangible or intangible resources at the firm's disposal.

(Mwailu & Mercer, According to Barney (1991) SCM effectively translates into valuable resources that are neither perfectly imitable nor substitutable without great effort. A broken supply chain can cripple the NGOs system and undermine positive outcomes. Most problems arise from uncertainties or the inability to coordinate various activities and partners. Operational excellence Organizations strive to enhance performance, which leads to the avoidance of waste by improving cost efficiency, quality, reliability, and compliance security.

As Wright, Jones & Hoyle (2009) portend, there is need for organizations to identify process inefficiencies by such tools as value streaming maps or calculating process capability. Operational excellence is banked on organization's ability to deliver unique, differentiated, and outstanding values to their customers. Operational Excellence in Supply Chain Management implies excellence within each of the individual processes and in the way the supply chain operates. Customers expect high levels of quality, cost and service in all of their interactions that may be achieved through efficient supply chains. Supply chain processes should work together, with seamless information flow and smooth material handoffs ensuring that another group should not be the cause of a late delivery and lose credibility for the entire supply chain (ARC Advisory group, 2002).

2.1.2. Humanitarian Supply chain management Practices

Supply Chain Management Practices covers a set of activities and processes from upstream and downstream and firm's internal operations. This is in line with Ballou et al. (2000) that conceptualize supply chain management as three dimensions: intra-functional coordination, inter-functional coordination, and inter-organizational coordination. Humanitarian supply chain is the central to disaster relief due to its function to serve as a bridge between disaster preparedness and response as well as between procurement and distribution (Van Wassenhove, 2006).

2.1.2.1. Sourcing/Procurement Management Practice

One important element of supply chain management is the sourcing and procurement of materials and services (Vitasek, 2010). Procurement is the process of obtaining services, supplies, and equipment in conformance with applicable laws and regulations and can take place locally, nationally, and internationally among a number of publics, private, national, and local entities (Rao, *et al.*, 2006).

Most organizations find it helpful to prepare a sourcing/ procurement manual as a guideline for company employees. Sourcing/procurement manuals, standard operating procedures, and guides that help define and implement the procurement processes that an organization uses to complete procurement operations. The sourcing/procurement process at BIRHAN's include the following process: preparing and submitting purchase request (PR), approving the purchase request by the concerned authority, preparing request for quotation (RFQ), conducting comparative bid analysis (CBA) as per the threshold, select the winner supplier or vendor, issuing purchase order (PO)/contract to the winner supplier, receiving goods to warehouse (GRN) and issuing reception note, and effecting payment when after goods are received from the supplier/vendor.

2.1.2.2. Inventory Management Practice

“Inventory management in relief operations is unique in that the time values of the commodities are much greater than the inventory carrying costs. Having the food available and moving it as rapidly as possible is much more important than holding minimal stock levels” (Long and Wood, 1995).

An important aspect of inventory management practice is inventory movement and control, which is used to show how much inventory is available at any given time and how it is tracked. The vital stock control measurements include establishing levels of operating stocks based on consumption/rate of usage; ensuring that weekly and monthly stock balances reports of each stock item and the total value are prepared; maintaining monthly stock usage report of each item kept in the store and the overall usage trend in six months; reviewing and reporting on a biannual basis slow moving items indicating the last movement date, the unit value, and total value, and liaise with user department; establishing quantity, lead -time and availability of each item supplied on the market; and tracking orders for goods.(Muller,2011).

2.1.2.3. Transportation management practice

Delivery of humanitarian services to beneficiaries is one of the most critical operations of HSCM which is known as last mile delivery (Balcik et al., 2008). Transport management in emergencies program is a complex task depending on the nature of the disaster. How it is structured is very dependent on the state of infrastructure, security in disaster area, demand, nature of product etc. (Logistics Cluster, transport, 2011)

In addition, an efficient and effective fleet management and distribution system is highly reliant on choosing the right route. Transport is serious to catastrophe relief, and vital aspect of humanitarian logistics is the prerequisite for containment, capacity utilization, planning and maintenance.

Faster and more costly transportation permits maintenance of lower inventory levels kept as a result of a more responsive system (Coyle *et al.*, 2003).

2.1.2.4. Warehouse/Facility Location Management practice

Warehouse location management is a key issue that has a significant impact on the achievement of relief operations. Facility location concerns the placement of facilities taking several characteristics into account such as demand, size, and location (Caunhye, Nie, & Pokharel, 2012). Distributing relief supplies from strategically- located warehouses improves the efficiency of disaster relief in economic terms, but also in terms of transportation efficiency, speed, and demand satisfaction (Döyen, Aras & Barbarosoğlu, 2012).

2.1.3 Factors affecting Humanitarian Supply Chain Management practices

Disaster relief operations are characterized by several challenges that need to be adequately managed; since the disaster relief operation with immediate response requirement needs timely action to implement better response mechanism.

Overstreet *et al.*, (2011) identified the major challenges of humanitarian supply chain management as often having to deal with unknown demand, short delivery time, unexperienced logistics staff, awkward media pressure, lack of funding, insufficient equipment and technology, and inappropriate political interference.

The humanitarian response situation reports for Ethiopia El-Nino response (2017) identified the following challenges: lack of funding, security, lack of storage capacity, information gap, knowledge gap and human resource.

2.1.3.1. Lack of Funding

The major challenge that was hindering El-Nino disaster responses was lack of funding. Except for \$8.8 million for school feeding by the Government and little funding received from UNICEF and Save the Children International, no significant funding was available; including for more than 500 closed schools in Somali and Oromia regions (Humanitarian Situation Report, 2017).

2.1.3.2. Lack of Storage capacity

The large volume of humanitarian cargo arriving in emergency response to the drought had put available storage space. As a result, there was a critical need for additional facility and interim storage facilities. Makeshift warehouses have been set up in remote locations across the country. The large volume of incoming humanitarian cargo strained the existing storage capacity. The need for additional warehouses and interim storage facilities in the center, Woreda and FDP was identified.

2.1.3.3. Human Resources to Manage supply chain

The government's limited ability to process requests during emergencies is a common problem in many humanitarians' response programs, both slow-onset and urgent. Thus, the staffing of local or national partners, including training and capacity building, could complement the operation. The authors Kovács and Spens (2009) distinguish 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). The term 'disaster relief' is usually used for operations that cope with sudden catastrophes (natural or manmade disasters).

2.1.3.4. Demand Uncertainty

The biggest problem in humanitarian logistics is uncertainty. Often there will be no signal of when a disaster strikes, how many people will be affected, what infrastructure will remain in place, what suppliers will donate, or what other obstacles may arise. Uncertainty can stem from many elements relating to the mission, the organization itself, or nature of the demand. For example, uncertainty may arise from inherent characteristics such as what and how much material is demanded, product traits, process fluctuations, and supply problems (Van der Vorst and Beulens, 2002).

2.1.3.5. Degraded Infrastructure

Poor transport infrastructure is another obstacle to effective assistance. The rapid onset of a disaster can affect the country's existing infrastructure so severely that aid is seriously hampered. "Often transportation infrastructure is in poor condition and cannot handle the huge numbers of refugees,

military vehicles, and relief shipments that pour into these areas in times of disaster. (Gooley, 1999).

2.1.3.6. Supply Chain relationship

Supply chain growth aims to improve productivity, customer reaction and the ability to add value to customers, as well as connectivity and interdependence between shareholders. Due to the market expansion from the domestic market to the world market, customer requirements are increasing, for example for lower prices, faster delivery, higher quality products or services and an increased variety of articles. The end customer in today's marketplace is governed by the success or failure of supply chain management practices. They claimed that the right service or product at the right price at the right time for the right customer was not only the competitive success but also the key. The same applies to the humanitarian supply chain because the aim is to obtain the right relief supplies for the affected beneficiaries at the right time in order to save lives. In supply chain management practices, supplier relationship activities play an important role. Long-term relationships refer to intention that the arrangement is not going to be temporary (Chen and Paulraj, 2004).

2.1.3.7. Earmarking of Funds

Donor oversight of the use of funds, ensuring that donations go directly to recipients, along with the allocation of grants for specific aid activities, to focus Investing in direct aid, rather than investing in systems and processes, will reduce costs or make aid more effective in the long run. Thus, the funding mechanism stimulates disaster response approaches and impedes strategic disaster preparedness capabilities. This results in an underinvestment in the infrastructure such as information system and warehousing facilities, and a reluctance to preposition inventory to improve responsiveness.” (Thomas, 2003).

2.2 Empirical Literature Review

Empirical literature review has shown that many studies of the factors influencing the practice of human supply chain management; and this has been done mainly in the context of more developed countries, since all the necessary resources are available, this topic has not been studied in developing countries such as Ethiopia.

2.2.1 Factors affecting Humanitarian Supply Chain Management practices

Each of the following subsections addresses issues that negatively affect the supply chain management during humanitarian missions. The manager responsible for managing their

consequences is challenged to direct **these activities beyond their agency, its partners** and beneficiaries.

2.2.1.1 Demand Uncertainty

The biggest problem in humanitarian logistics is uncertainty. Often there will be no signal of when a disaster strikes, how many people will be affected, what infrastructure will remain in place, which vendor donate, or what other challenges may occur. Uncertainty can arise from many factors related to the operation, the organization itself and the nature of the demand. As the supply chain becomes larger and more geographically varied, natural and man-made disasters can also unsettle the supply chain.

Like other business partners, logistics managers on a humanitarian organization will have an ideal environment in terms of predictable demand, easy accessibility, and collaboration partners; Instead, there is often a chaotic, possibly hostile atmosphere where every minute can mean another life is saved. The nature of the condition ensures that the transporting accessibility for humanitarian materials is highly volatile. Logisticians often have little or no sight of what and how much material they must delivered, when and where it is to go.

Resource (e.g. inventory) pooling and sharing through provision of alternative supply sources underpins the risk-hedging strategy to mitigate vulnerability against exposure to high supply uncertainty. In contrast, agile supply chains can handle both supply and demand uncertainties, as they build flexibility and responsiveness into their systems and processes. According to Lee (2002), the agile strategy has an encompassing nature in the sense that it embraces the advantages of both risk-hedging and flexible (responsive) supply chain strategies. As discussed above, strategic models of SCM play a fundamental role in enabling contingent-based strategy design that promises improved SCM through targeted focus on supply, demand, products, and the manufacturing process.

H_{1a}: Demand uncertainties negatively and significantly affects the supply chain management of the organization.

2.2.1.2 Lack of Information Technology adoption

The exponential growth of Information Technology (IT) with communication technology in Supply Chain Management (SCM) is playing critical role in optimizing decisions of the supply chain network flow for achieving organizational competitiveness, improving higher service level, lowering inventory, supply chain costs and reducing electronic risks (e-risks). To achieve

integration and effective information sharing across and beyond the organizations, IT in SCM is also required. The organizations are moving towards the virtual supply chain with help of rapid changes in technology and IT applications viz; Electronic Data Exchange (EDI), Radio Frequency Identification (RFID), Bar Code, Electronic Commerce, Decision Support system, Enterprises Resource Planning (ERP) package, etc. It is also easily applicable in curbing the e-risks.

Advanced information and manufacturing technologies for better managing their supply chains (Talluri,2000) providing information availability and visibility and allowing decisions based on total supply chain information (Simchi-Levi et al., 2003).

H_{1b}: Lack of information technology adoption negatively and significantly affects the supply chain management of the organization.

2.2.1.3 Degraded Infrastructure

Poor transport infrastructure is another obstacle to effective assistance. In the DMTP logistics handbook, it states “the overall effectiveness of relief logistics often depends on the level of prior investment in both the transport and communications infrastructure and how far relief requirements have been considered in the planning” (DTMP, 1993). The rapid onset of a disaster can affect the country's existing infrastructure so severely that aid is seriously hampered. “Accurate assessment of the road infrastructure is critical...a road may be a five-foot wide strip of mud only inches above the water line that can accommodate only scooters and livestock, or it can be an eight-lane highway pocketed with bomb craters.” (Long and Wood, 1995).

Poor communication is a major obstacle to helping the beneficiaries. When speaking with a person who speaks another language, not only unconscious difficulties arise, but also the communication infrastructure can be damaged as a result of a natural disaster. Groups such as disaster areas may not be able to contact headquarters or sponsors. Aid agencies are unable to effectively communicate their needs to donors. Organizations may use different names and definitions for modes of transport, materials, and crews. “Ironically, interorganizational relations are usually a challenge to the relief effort instead of a source of support. Each organization has its own operating methods and goals, and it is only with great effort that they coordinate their plans and share sources” (Long and Wood, 1995).

H_{1c}: Degraded infrastructure negatively and significantly affects the supply chain management of the organization.

2.2.2.4 Supply chain relationship

Supply chain relationships play an important role in achieving the firm's goals. The coordination and integration of activities with suppliers and understanding of customer's needs results in greater benefits for companies. Strategic supplier partnerships and customer relationships are main components in the supply chain management practices (*Li et al., 2005*). Two sub-factors are considered in the model relationship with suppliers and customers.

Relationship with Suppliers- Companies are inclined to work with different suppliers in different ways. It is important that the relationship with suppliers satisfies their company needs. Hines (2004) mentioned that in commodity products, it is common to find an adversarial relationship mainly based on price between buyer and supplier. This type of relationship with suppliers does not allow for cost reduction in the supply chain. It may be beneficial to network the supplier, to develop partnerships and alliances that will benefit both partners. This could be based on production, personal, and or symbolic networking, that will turn on strategic alliances (Hines, 2004), allowing the information sharing, risk sharing, obtaining mutual benefits, and coordinating plans, permitting the improvement of the supply chain.

Relationship with Customers-The global markets offer a variety of products of different quality and cost. As a result, companies are always competing and trying to reduce costs and improve quality.

H_{1d}: Supply chain relationship negatively and significantly affects the supply chain management of the organization.

2.2.2.5 Earmarking of Funds

The major challenge faced by logistics managers in humanitarian organizations is that the fund raiser has significant influence over where and how aid is distributed, while the victim is a third party.

In effect, the earmarking of funds violates the humanitarian ethos of impartiality by placing stipulations on how relief is administered. Macrae and others point out that "the idea of humanitarian aid as a distinctive form of assistance governed by principles of impartiality and neutrality is being gradually eroded. In particular, its independence from the foreign policy objectives of donor states is under threat, both in principle and in practice" (2002). This is a political and administrative issue that has profound insinuations for logistics managers as the aid

organization focuses on delivering the most aid items to the most affected beneficiaries in the most visible crisis rather than on promoting efficiency in the distribution of aid Logistics operations.

H_{1e}: Earmarking of funds negatively and significantly affects the supply chain management of the organization.

2.2.2.6 Human Resources to Manage Supply Chain

The limited ability of the government to process emergency requests is a frequent problem in many humanitarian response situations, whether it is slow or quick to start emergencies. Therefore, an increase in the number of local or national partners, including training and capacity building, could be complementary to the operation.

H_{1f}: Lack of skilled human resource negatively and significantly affects the supply chain management of the organization.

2.3. Conceptual Framework

Conceptual frameworks can act like maps that give coherence to experiential inquiry. According to Botha (1999), conceptual frameworks are defined as “a type of intermediate theory that attempt to connect to all aspects of inquiry (e.g., problem definition, purpose, literature review, methodology, data collection and analysis)”. A conceptual framework was constructed to inform the development of the survey instruments noted in previous chapters.

The conceptual framework proposes that SCM practices will have an effect in humanitarian relief operations and a brief consideration of benchmarking.

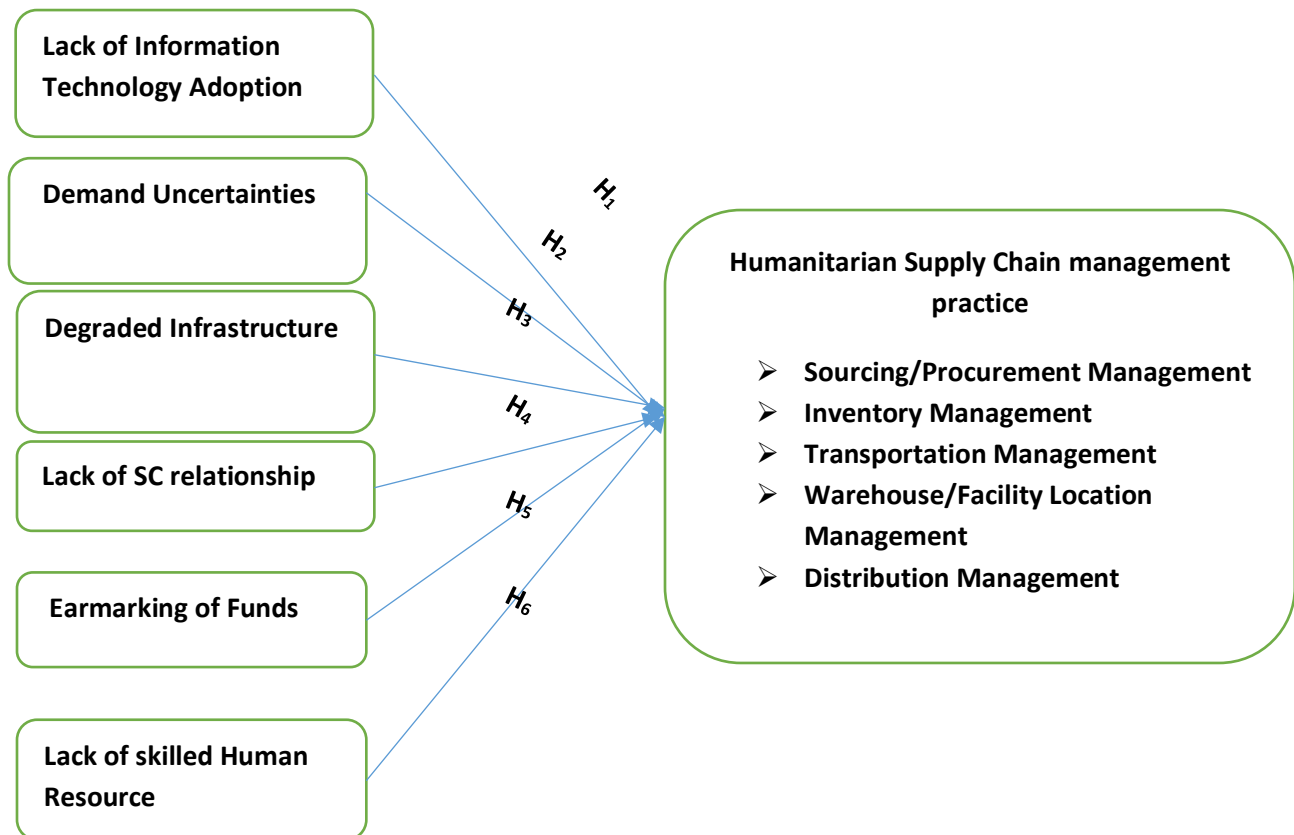


Figure 1: Conceptual framework

(Researcher, Info. BIRHAN for mothers and children morbidity and mortality Ethiopia program Operation and Admin dept.)

2.4 Summary of Hypothesis

H_{1a}: Demand uncertainties negatively and significantly affects the supply chain management of the organization.

H₀: Demand uncertainties does not affect the supply chain management of the organization.

H_{1b}: Lack of information technology adoption negatively and significantly affects the supply chain management of the organization.

H₀: Lack of information technology adoption does not affect the supply chain management of the organization.

H_{1c}: Degraded infrastructure negatively and significantly affects the supply chain management of the organization.

H₀: Degraded infrastructure does not affect the supply chain management of the organization.

H_{1d}: Lack of supply chain relationship negatively and significantly affects the supply chain management of the organization.

H₀: Lack of supply chain relationship does not affect the supply chain management of the organization.

H_{1e}: Earmarking of funds negatively and significantly affects the supply chain management of the organization.

H₀: Earmarking of funds does not affect the supply chain management of the organization.

H_{1f}: Lack of skilled human resource negatively and significantly affects the supply chain management of the organization.

H₀: Lack of skilled human resource does not affect the supply chain management of the organization.

2.5 Identified Literature gap

The above empirical literature shows that different researchers have different ideas on factors affecting supply chain management practice in humanitarian organization. Most of the research focuses on business supply chains. The factors that affect humanitarian supply chain management practices in humanitarian response program have not been extensively researched, and some studies on this topic have not been discussed in detail, focusing on a general view of how supply chain operations should be managed.

Besides, there are a number of research gaps that have been detected in the studies reviewed to date. There is little research on humanitarian supply chains, especially in humanitarian response program with the specific context of a developing country like Ethiopia particularly in BIRHAN for mothers and children morbidity and mortality Ethiopia program; since, developing countries does not usually have all the required resources to cope with disasters nor they are able to respond once disaster strikes.

CHAPTER THREE

METHODS OF THE STUDY

Research as defined by many authors (Bashir, Afzal & Azeem, 2008; Creswell, 2003; McMillan and Schumacher, 2006; and Best, 2006) is the systematic application of scientific method to the problem under consideration. Research methodology therefore presents the overall framework on how research results may be achieved through data collection and analysis. This chapter deals with the methods that will be used in the research to come up with the findings of the study. Thus, it introduces the research approach, the research design, the research population and sample of the study, data sources and types, data collection procedures and ethical consideration.

3.1 Description of the Study Area

BIRHAN for mothers and children morbidity and mortality Ethiopia program is one of Humanitarian organization found in Ethiopia with a focus on morbidity and mortality of children and mothers. Therefore, the researcher has, thus, been inspired to conduct a study on the effect of supply chain management in Humanitarian relief logistics in benefits and challenges of outsourcing practice in BIRHAN Ethiopia program and forward possible recommendations.

3.2 Research Design

This study applied a mixed of descriptive and explanatory research designs research design that involved collecting and analyzing data. Descriptive research design supports the researcher describe trends in terms of attitudes, values, and characteristics. And it able to describe the mean outputs. The researcher also employed explanatory research design was used in order to focus and explain the aspects of the study in a detailed manner.

3.3 Research Approach

In support of Sale *et al.* (2002), on Wuegbuzie and Leech (2006) identify the following rationales for mixing qualitative and quantitative approaches: participant enrichment, instrument trustworthiness, treatment integrity and significance enhancement. Therefore, the study was employed a mixed approach (qualitative and quantitative research approaches) and it allows triangulation of findings, which can strengthen validity and increase the utility of the study.

Quantitative research is to classify features, count them, and construct statistical models to explain what is observed while the qualitative approach supports the researcher to complete detailed descriptions, describe magnitude and distribution by using self-administered questionnaire. In

addition to that it gives an in depth understanding of the variable context in relation to humanitarian supply chain practice by using semi-structured in-depth interview.

3.4. Population and sample of the study

3.4.1. Population and Sampling

The population for the study was included all operation staffs of BIRHAN for mothers and children morbidity and mortality Ethiopia program specifically from (warehouse assistances, transport assistances , supply chain assistance, procurement assistances, warehouse officers, transport officers , supply chain officers, procurement officers, senior warehouse officers, senior transport officers, senior supply chain officers, senior procurement officers, operation and admin manager, logistics manager, supply chain managers ,ICT officers and ICT manager).The total population assessed under this study was 74. (According to HR department of the organization). Out of the total 74 study participants 7 of top-level managers was interviewed.

The existing population size of BIRHAN for mothers and children morbidity and mortality Ethiopia program is limited. Regarding sampling method, the study did not perform rigorous statistical calculation of sample size rather considered census method due to the limited size of the study population. Because they are large and comprehensive, the censuses are accurate, detailed, and reliable.

3.5 Data Sources and Types

To conduct this study, both primary and secondary data sources were used, primary data were requested through structured questionnaires and interviews, and secondary data were collected from relevant documents related to the research topic, that is, from annual reports, journals, related publications related to the topic under investigation of the study.

3.6 Methods of Data Collection

Before collecting data, the researcher submitted the formal letter from Addis Ababa University, Department of Logistics to BIRHAN for mothers and children morbidity and mortality Ethiopia program, to get the permission of collecting the necessary information from the research participants.

The data was collected using self-administer questionnaires having self-assessment items measured on the 5-point Likert type of scale strongly disagree, disagree, indifferent, agree, strongly agree and using semi-structured interview. The questionnaires were accompanied with an introductory letter from the researcher explaining the purpose of the study. The researcher

distributed questionnaires by using the hard copy and email for staffs who participate in the questionnaire's session. A standardized open-ended interview was conducted with seven of top-level managers of BIRHAN's staff.

3.7 Method of Data Analysis and presentation

For this study, as the researcher used raw data including of both quantitative and qualitative data. When analyzing the quantitative data collected from the questionnaires was tested and validated, the study was used descriptive statistics using Statistical Package for Social Sciences (SPSS version 23.0). Tabular data representations were used as needed to describe the data findings.

Descriptive and inferential statistical analysis techniques were employed. With regards to the descriptive analysis mean and Std. were calculated on the other hand, inferential statistical technique was employed to analyze information related to the objectives of the study. A multiple regression analysis with a confidence level of 95% with p-value < 0.05 is significant for all analysis results, was used to measure the major factors that affect the humanitarian supply chain management practices of BIRHAN for mothers and children Ethiopia program. And A Kendall's coefficient of concordance was computed to assess agreement among observers of very high resolution of the six factors affecting humanitarian supply chain management practices of the organization.

3.8 Validity and Reliability test

Validity Test

The researcher administered the questionnaire for five respondents who are working in stock and distribution directorate. The respondents were asked to fill the questionnaire in 20-30 minutes and the researcher was there to assist them. They also asked to comment on the format and wording of the questionnaire. By taken their comments into account, a few changes were made to the questionnaire. Some of the changes were related to questionnaire's format and spelling errors.

Reliability test

“Cronbach's Alpha is very useful in developing attitude scales and questionnaires as the alpha level (or reliability) indicates if the items are measuring the same construct. Items that are not measuring what the rest are can be identified and deleted. Bryman and Bell, (2007) also stated that a reliability coefficient of .70 or higher is considered "acceptable" in most social science research situations.

A reliability test was performed to see whether the study was given similar results if the same study is repeated. To ensure reliability of this study, a Cronbach's Alpha test was performed to check the reliability of data collecting instrument i.e., a five-point likert scale questionnaire.

Table 3. 1:Reliability Statistics

	N of Items	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
Overall Reliability	57	0.839	0.840

(Source: Survey Result, 2021)

As indicated above the overall Cronbach's alpha score of the data collected from 65 respondents is 0.839. According to Nunnally, (1978) Cronbach's alpha score of 0.7 and above is an acceptable reliability coefficient.

3.9 Ethical Consideration

Ethics are norms or guidelines of conduct that guide ethical decisions about our behavior and our relationships with others. The purpose of ethics is to ensure that research activities do not harm or affect anyone. The researcher has provided a complete information about the purpose of the study, the status and role of the researcher in building trusting relationships with respondents.

The researcher gave due regard for participants and clearly stated their right not to take part in the study and revealing of the need for privacy of their response and use of data to be reliable. Researcher retained objectivity of the study in the process of data collection, during analysis of the collected data and report planning stages which aided in maintaining the balance and prevent bias. In addition, the researcher did not disclose any personal data of the participants and that was described during the distribution of the questionnaire. And credit will be given to the authors and organization publications that are to be used in the research.

CHAPTER FOUR

FINDINGS, INTERPRETATION AND DISCUSSION OF RESULTS

This chapter covers the analysis and discussion of two major parts. Part one involves the descriptive analysis of the respondent profile participated in the study. Hence, the respondents were discussed in terms of gender, age, educational level, position in which they work and years of service. Part two deals with the analysis of the findings provided by the respondents regarding of the factors affecting the humanitarian supply chain management practices with a specific focus in the BIRHAN for mothers and children morbidity and mortality Ethiopia program.

4.1 Response rate

A total of 74 questionnaires were distributed, of which 65 completed questionnaires were returned, nine respondents were not present at work for various reasons, the response rate was 87.84%, is valid and was used for analysis. The collected data were analyzed using SPSS (version 23) statistical software.

4.2 Respondent's Demographic Data

The primary survey was intended to provide general information about the supply chain professionals participating in this study regarding their gender, age, educational level, the position in which they worked, and years of experience in the organization.

Based on the responses obtained, as shown in Table 4.1, - Item A and B reveal gender and age distribution of the respondents, respectively. 59.1 % and 39.9% respondents were accounted to male and female, respectively. Therefore, majority of the respondents were male. With regards age, 39.4% of the respondents' falls within the age category between from 26 up to 30.

Respondents, as employees of BIRHAN for mothers and children morbidity and mortality Ethiopia program have been working there for a variable level of academic background. As indicated in Table 4.1, Item C, 35 respondents (53 %) had bachelor/first/ degrees which lead the sample, 16 respondents (24.2 %) had college diploma, 11 respondents (16.7%) have second degree & above and 3 (4.5%) are G.12-completed.

Respondents also asked to indicate their position/title in which they are working. As depicted in Table 4.1-item D, each of 6 respondents (9.1%) were assistance level as of transport and procurement assistances respectively. Respondents who had a service 3-5 years' category as the majority of the respondents which comprised 29 (43.9%) followed by 22 (33.3%) of respondents who served less than 2 years. Twelve (18.2%) of the respondents had 6-10 years of experience in

the organization, and the rest 2 (3%) had above 10 years' experience. It would, therefore, It can be generally concluded that a relatively longer year of service could help the respondents gain a wealth of experience and a better understanding of various issue related to humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality Ethiopia program.

Table 4. 1: Demographic Profile of the Respondents (N=65)

A. Gender	Frequency	Percent
Female	26	39.4
Male	39	59.1
Total	65	98.5
B. Age	Frequency	Percent
18-25	20	30.3
26-30	26	39.4
31-40	13	19.7
Above 40	6	9.1
Total	65	98.5
C. Education Status	Frequency	Percent
G.12 completed	3	4.5
College diploma	16	24.2
First degree	35	53
Second Degree and Above	11	16.7
Total	65	98.5
D. Position/Title	Frequency	Percent
Warehouse Assistant	5	7.6
Transport Assistant	6	9.1
Supply Chain Assistant	5	7.6
Procurement Assistant	6	9.1
Warehouse Officer	4	6.1
Transport Officer	5	7.6
Supply Chain Officer	4	6.1

Procurement Officer	4	6.1
Senior Warehouse Officer	3	4.5
Senior Transport Officer	3	4.5
Senior Supply Chain Officer	3	4.5
Senior Procurement Officer	2	3
ICT Officer	4	6.1
Operation and Admin Manager	1	1.5
Logistics Manager	2	3
Supply Chain Manager	2	3
ICT Manager	2	3
Others	4	6.1
Total	65	98.5
E. Years of Experience	Frequency	Percent
Less than 2 years	22	33.3
3-5 Years Old	29	43.9
6-10 Years Old	12	18.2
Above 10 Years	2	3.0
Total	65	98.5

(Source: Survey Result, 2021)

4.3 Humanitarian Supply Chain Management Practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.

The study was conducted with a first objective to assess the existing humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program. Supply chain professionals of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program were asked to measure humanitarian supply chain practices using five scale Likert scaled responses namely: strongly disagree, disagree, indifferent, agree and strongly agree.

The numbers entered to SPSS thus represented the weight and thus the weighted averages for the scales were calculated to understand the mean values. This was accomplished by dividing the distances between the scale values (4 in a 5-point Likert Scale by the number of values (5). Thus,

the period length is $4/5=0.80$, which is used to calculate the weighted averages (Alfarra, W.A.,2009).

The weighted average categories for each result are shown in Table 4.2 below and each result is interpreted with the degree of agreement for each factor calculated accordingly.

Table 4. 2: Weighted Averages for 5-point Likert Scales

Weighted Average	Result	Result Interpretation
1.00-1.79	Strongly Disagree	Very un-influential
1.80-2.59	Disagree	Un influential
2.60-3.39	Neutral	Neutral/do not know
3.40-4.19	Agree	Influential
4.20-5.00	Strongly Agree	Very Influential

(Source: Alfarra, W.A., 2009)

Humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program are as follows.

4.3.1. Sourcing/Procurement Management Practices

The respondents were asked to express their opinion on what, in their opinion, the current sourcing/ procurement management practice of BIRHAN mothers and children looks like. As it can be seen from the below table 4.3, The overall Sourcing/Procurement Management Practices of BIRHAN for mothers and children with their suppliers is good but which still needs improvement as the aggregated mean (3.98) indicates in the above table 4.3.

Table 4. 3: Sourcing/Procurement management practices in BIRHAN for mothers & children (N=65)

Sourcing/ Procurement Management practices	Mean	Std. Deviation
We have the practice of conducting initial need assessment shortly after the disaster strikes.	3.37	.876
We have the practice of quantifying the relief supplies required to meet needs of the affected population	4.06	.747
We have the practices of reviewing the need for relief supplies to identify the stock of prepositioned supplies in the warehouse before determining the quantity of relief items to be procured from suppliers.	4.02	.696

We have the practices of preparing purchase request for the items that need to be procured from suppliers.	3.98	.760
We have the practices of preparing Request for Quotation to get price quotes from suppliers as per the required specification	4.02	.673
We have the practice of conducting comparative bid analysis to identify the successful supplier based on the predefined selection criteria.	4.12	.650
We have the practices of placing purchase order to procure the relief supplies from successful suppliers.	4.00	.707
We have the practices of negotiation and contract management with suppliers.	4.12	.718
The organization effects payment for suppliers after goods are delivered to the warehouse as per the predefined specification and agreed up on terms and conditions.	4.08	.735
The organization maintains long term agreements with potential suppliers in order to improve supply capacity need during disaster occurrence.	4.02	.760
Aggregated Mean	3.98	

(Source: Survey Result, 2021)

4.3.2. Inventory Management Practices

Respondents were also asked to give their opinion on what they thought the current inventory management practice of BIRHAN for mothers and children looks like. As we can see Table 4.4, the overall inventory management practices of BIRHAN for mothers and children are good as the aggregated mean (3.82) indicates in the above table which still needs improvement. One important aspect of inventory management practice is stock control and movement. The result is compatible with the study of Muller the vital stock control measurements include ensuring that weekly and monthly stock balances report of each stock item and maintaining monthly stock usage report of each item kept in the store and the overall usage trend (Muller, 2011).

Table 4. 4: Inventory management practices in BIRHAN for mothers & children (N=65)

Inventory Management practices	Mean	Std. Deviation
We have a practice of using Reception Note to receive relief items to the warehouse.	4.62	.490
We have the practice of using Delivery Notes to issue relief items to their destination.	4.31	.748
We use stock cards to know stock balance of relief items in the warehouse.	3.97	.637
We conduct regular stock count of inventory to determine the balance of relief items on hand.	4.02	.696
We have a procedure for timely disposal of obsolete and expired relief items.	2.95	.598
We track the stock inventory in the warehouse using the automated system.	3.11	.812
The organization maintains safety stock of inventory of relief items to quickly respond to disasters when they occur.	3.78	.927
Aggregated Mean	3.82	

(Source: Survey Result, 2021)

The overall inventory management practices of BIRHAN for mothers and children are good as the aggregated mean (3.82) indicates in the above table which still needs improvement. One important aspect of inventory management practice is stock control and movement. The result is compatible with the study of Muller the vital stock control measurements include ensuring that weekly and monthly stock balances report of each stock item and maintaining monthly stock usage report of each item kept in the store and the overall usage trend (Muller, 2011).

4.3.3. Transport Management Practice

Transport is critical to disaster relief and is an important aspect of humanitarian logistics that is needed to address transport utilization, capacity utilization, scheduling and maintenance during emergencies.

Transport practice of humanitarian supply chain management with a grand mean of 3.77 tells us that; the overall transport management practices of BIRHAN for mothers and children are good.

Table 4. 5: Transport management practices in BIRHAN for mothers & children (N=65)

Transport Management practices	Mean	Std. Deviation
We have the practices of determining transport modes to deliver the relief supplies to affected area.	3.94	.747
We have the practices of deciding load capacity to fully utilize the transport facility to move relief supplies to their destination.	3.94	.609
We have the practices of scheduling the transportation of relief supplies to beneficiaries.	3.42	.788
We have the practices of tracking the movement of transport facilities while travelling to their destination.	3.71	.744
We have the practices of accompanying the freight with the waybill to ensure the legality of the consignment	3.85	.618
Aggregated Mean	3.77	

(Source: Survey Result, 2021)

4.3.4. Warehouse/Facility location Management Practices

Warehouse/ facility location management practices of BIRHAN for mother and children Ethiopia program was also assessed. As we can see the below table 4.5 The aggregated mean ($X=4.03$) indicated that the overall BIRHAN for mothers and children warehouse/facility location management practices are good. Since the response of the respondents inclined to being indifferent for the question related to the practices of deciding the size; number and capacity of the warehouse facilities based on demand ($X=3.85$), and the organization should work on that and improve the warehouse location management.

Table 4. 6: Warehouse/Facility location management practices in BIRHAN for mothers & children (N=65)

Warehouse/Facility location Management practices	Mean	Std. Deviation
The organization locates warehouse facility at strategic places to quickly respond to disasters when they occur.	4.09	.551
We have the practices of deciding the size, number and capacity of the warehouse facilities based on demand.	3.85	.690

We have the practices of receiving relief supplies to warehouse after they are procured.	4.17	.651
We have the practice of packaging the relief supplies to protect the relief items from damage.	3.95	.672
We have the practices of dispatching relief items to disaster areas	4.05	.759
We have the practices of using material handling equipment to load/unload the relief items	4.09	.765
Aggregated Mean	4.03	

(Source: Survey Result, 2021)

4.3.5. Distribution Management Practices

Distribution practice of BIRHAN for mother and children Ethiopia program is good practiced in disaster relief operations with aggregated mean of ($X=4.00$) as we can see in the below Table 4.7. HSCM initially has no production units, only warehouses. In addition, a large number of donations are collected during a natural disaster. It can often be noted that donations may not always be useful at the time, or they may need to be kept taking up space.

Table 4. 7: Distribution management practices in BIRHAN for mothers and children (N=65)

Distribution Management practices	Mean	Std. Deviation
We practice definition of distribution points to minimize the distance to beneficiaries.	4.17	.675
We design the flow of materials for distribution keeping in mind the people who require it	4.00	.559
We practice distribution of supplies from central distribution centers	3.91	.765
We practice timely distribution of relief supplies to the beneficiaries	3.94	.704
Aggregated Mean	4.00	

(Source: Survey Result, 2021)

Table 4. 8: Humanitarian supply chain Management practices summary

Humanitarian Supply chain management practice	Grand Mean
Sourcing/Procurement Management Practices	3.98
Inventory Management practices	3.82
Transport Management practice	3.77

Warehouse/Facility location Management practices	4.03
Distribution Management practices	4.00

(Source: Survey Result, 2021)

Warehouse/Facility location Management practices has shown a higher grand mean of 4.03 which implies that Warehouse/Facility location Management practices is the backbone of humanitarian relief supply chain management practices. Respondents shown to have favored with a strong agreement to the organization which locates warehouses in strategically important locations to respond quickly to natural disasters when they occur, determine the size, number and capacity of storage facilities based on demand, receive assistance goods from the warehouse after purchase, As per the interview was conducted with top level managers of BIRHAN for mothers and children, the below remarks are identified as the humanitarian supply chain management practices of the organization.

The practice of humanitarian supply chains management in disaster relief operations is dependent on regular examination of the operational context, which includes gathering information on transport market capacity, road convenience, market availability to procure supplies from local markets, and local storage capacity and availability. Most humanitarian organization with strong supply chain management practices involving procurement, transportation, warehousing, and information management, regardless of formal and informal governance rules and regulations.

4.4 Factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children

4.4.1 Regression Analysis

The regression analysis is performed to find out to what extent the independent variable explains the dependent variable in simple linear regression or multiple linear regression. This regression analysis is conducted to know by how much the factors affecting humanitarian supply chain management explains the humanitarian supply chain management practices of BIRHAN for mother and children.

4.4.1.1 Normality Distribution Test

A data set is symmetric if it's equivalent to the left and right of the middle point. As shown in the below table (4.9), the skewness and kurtosis test results of the data is inside the appropriate range of (-1.0 to +1.0) and it can be concluded that the data is normally distributed which is acceptable.

Table 4. 9: Normality distribution test (N=65) of BIRHAN for mother and Childeren

	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Negative effect on Humanitarian Supply Chain Management Practices	-.383	.297	-.163	.586
Demand Uncertainties	-.690	.297	-.426	.586
Lack of Information Technology Adoption	-.332	.297	-.762	.586
Degraded Infrastructure	-.337	.297	-.785	.586
Lack of Supply chain Relationships	-.221	.297	-.353	.586
Earmarking of Fund	-.548	.297	-.161	.586
Lack of Skilled Human Resource	.056	.297	-.674	.586

(Source: Survey Result, 2021)

4.4.1.2 Multi Collinearity Test

It is independent variables was directed to check whether the assumptions for regression analysis are satisfied or not. The result in table-4.10 shows that the collinearity between independent variables (demand uncertainties, lack of information technology adoption, degraded infrastructure, lack of supply chain relationship, earmarking fund and lack of skilled human resource) has no serious problem since the value of tolerance for all independent variables is greater than 0.2 and all VIF is less than ten ($VIF < 10$) (Myers, 1990). Therefore, the assumption for regression analysis is satisfied.

Table 4. 10: Multi Collinearity Test of independent variables (N=65)

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Demand Uncertainties	.929	1.076
	Lack of Information Technology Adoption	.885	1.130
	Degraded Infrastructure	.878	1.138
	Lack of Supply chain relationships	.973	1.028
	Earmarking of Fund	.979	1.021
	Lack of Skilled Human resource	.973	1.028
a. Dependent Variable: Negative effect on Humanitarian Supply Chain Management Practices			

(Source: Survey Result, 2021)

4.4.1.3 Regression Model

As per the below table 4:11, regression analysis was used to describe the relationship between the independent variables were factors (demand uncertainties, lack of information technology, degraded infrastructure, lack of supply chain relationships, earmarking of fund and lack of skilled human resource) and the dependent variable, humanitarian supply chain management practice and the independent those affecting humanitarian supply chain management practice . The ability of the independent variables to shed light on changes in the dependent variables is measured by adjusted R-square which occurred to be 44.5% it means, other factors not detected in this research contribute 55.5% of the effects on BIRHAN for mother and children humanitarian supply chain management practices.

Table 4. 11:Result of Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.705 ^a	.497	.445	6.700
a. Predictors: (Constant), Lack of Skilled Human Resource, Degraded Infrastructure, Earmarking of Fund, Lack of Supply chain Relationships, Demand Uncertainties, Lack of Information Technology Adoption				

(Source: Survey Result, 2021)

In the above table indicates that, a strong coefficient R correlation (.705) between humanitarian supply chain management practices and factors affecting humanitarian supply chain management practices of BIRHAN for mother and children.

4.4.1.4 Stepwise Multiple Regression Analysis: ANOVA

As we can be seen from the below table 4.12, the significant value is .000^b, which is less than 0.05. If the F ratio is large and probability is less than 0.05 then it is called as statistically significant. each independent variables has F-statistic of 9.54, it is large and the model is generally good fit and significant.

Table 4. 12:Stepwise Multiple Regression Analysis: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2570.22	6	428.37	9.54	.000 ^b
	Residual	2603.38	58	44.89		
	Total	5173.6	64			
a. Dependent Variable: Negative effect on Humanitarian Supply Chain Management Practices						
b. Predictors: (Constant), Lack of Skilled Human resource, Earmarking of Fund, Lack of Information Technology Adoption, Lack of Supply chain relationships, Demand Uncertainties						

(Source: Survey Result, 2021)

4.4.1.5 Stepwise Multiple Regression Analysis: Results of Coefficient

The below Table 4.13 shows that the Beta coefficient for demand uncertainties, lack of information technology adoption, degraded infrastructure, lack of supply chain relationships, earmarking of

fund and lack of skilled human resource are ($\beta=-.012$), ($\beta= -1.314$), ($\beta=1.271$), ($\beta= .302$), ($\beta=.432$) and ($\beta=.418$) respectively.

Table 4. 13: Stepwise Multiple Regression Analysis: Results of Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	43.408	15.283		2.840	.006
	Demand Uncertainties	-.046	.366	-.012	-.126	.901
	Lack of Information Technology Adoption	-4.797	7.035	-1.314	-.682	.498
	Degraded Infrastructure	4.620	7.014	1.271	.659	.513
	Lack of Supply chain Relationships	1.572	.491	.302	3.203	.002
	Earmarking of Fund	1.846	.402	.432	4.594	.000
	Lack of Skilled Human Resource	1.914	.433	.418	4.424	.000
	a. Dependent Variable: Negative effect on Humanitarian Supply Chain Management Practices					

(Source: Survey Result, 2021)

This proves that earmarking of fund ($\beta=.432$) is significant factor affecting humanitarian supply chain management practices in BIRHAN for mothers and children. lack of skilled human resource ($\beta=.418$) and lack of supply chain relationships ($\beta=.302$) respectively are scored second and third accordingly.

4.5. Kendall's. Wallis Coefficient of concordance of rank order analysis model

Kendall's Coefficient of Concordance, W, is a measure of the agreement between several judges who have rank ordered a set of entities. The assumption is that the value of Kendall's W is presumed to range between 0 (no agreement) and 1 (perfect agreement) (Field, 2005).

Table 4. 14: Rank order analysis model

N=57	Mean Rank	Rank
Lack of Information Technology Adoption	2.92	1
Degraded Infrastructure	2.95	2
Lack of Skilled Human Resource	3.12	3
Lack of Supply chain Relationships	3.15	4
Earmarking of Fund	3.18	5
Demand Uncertainties	4.68	6

N	65
Kendall's W ^a	.361
Chi-Square	117.193
df	5
Asymp. Sig.	.000

a. Kendall's Coefficient of Concordance

(Source: Survey Result, 2021)

From the table 4.14 above, lack of information technology adoption, degraded infrastructure, lack of skilled human resource, lack of supply chain relationships and earmarking of funds with a ranked mean value of 2.92, 2.95, 3.12, 3.15 and of 3.18 respectively are the top five factors affecting the supply chain management practices of BIRHAN for mother and Children morbidity and mortality Ethiopia program.

As per the interview was conducted with top level managers of BIRHAN for mothers and children the below comments are pinpoint as factors that affect the humanitarian supply chain management practices of BIRHAN for mothers and children Ethiopia program.

Infrastructure: There is a great lack of infrastructure development in the country. Road conditions are deplorable in most parts of the region, from rocky and hilly landscapes to delicate clay soils affected by deep soil erosion. Roads and bridges are often dismantled and almost impossible to deliver during the rainy season. The inaccessibility of the roads increases the waiting time for the delivery of aid to the beneficiaries.

Less transportation access with high costs and deterioration of roads, lack of potential supplier especially at district and woreda with lack of legal trade documentation like registered legal license, tin number, invoice and other.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

This chapter gives the summary of the findings of factors that affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program. The purpose of this study was to assess factors that affect the humanitarian supply chain management practices. This chapter also shows the conclusions comes from the findings, make recommendations and suggest areas for further research.

5.1 Summary of Findings

The results were noted earlier in Chapter 4, and based on these results, The study found that out of 65 respondents, the majority of the respondents are male and the majority of the come from transportation and procurement department regarding of the scope of experience, of most of the respondents includes around 3 to 6 years of professional experience. The results also show that most of them are bachelor's degree and have mostly had better experiences.

The first objective of the study was assessing the existing humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program and can be concluded that:

- ❖ As per the descriptive statistics result, sourcing/procurement management practices scored an aggregated mean of 3.98. This shows that BIRHAN for mothers and children have a good sourcing/procurement practice to support their supply chain operations.
- ❖ Inventory management practices have scored an aggregated mean of 3.82. This demonstrate that BIRHAN for mothers and children have good inventory management practice to support their supply chain operations.
- ❖ Moreover, an aggregated mean for transport management practices is 3.77. This infers that BIRHAN for mothers and children have good transport management practice to support their supply chain operations.
- ❖ An aggregated mean for warehouse/facility location management practices is 4.03. This infers that BIRHAN for mothers and children have good warehouse/facility location management practice to support their supply chain operations.
- ❖ Finally, distribution management practices have scored an aggregate mean of 4.00. This result show that BIRHAN for mothers and children have a good distribution management practice to support their supply chain operation.

The second objective of the study was to identify factors affecting the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program. As per the result of the regression analysis presented that earmarking of fund ($\beta=432$) is critical factor affecting humanitarian supply chain management practices in BIRHAN for mothers and children followed by lack of skilled human resource ($\beta=.418$) and lack of supply chain relationships ($\beta=.302$) respectively. Lack of information technology adoption with a ranked mean value of 2.92, degraded infrastructure with a ranked mean value of 2.95, lack of skilled human resource with a ranked mean value of 3.12, lack of supply chain relationships with a ranked mean value of 3.15 and earmarking of funds with a ranked mean value of 3.18 respectively are the top five factors affecting the supply chain management practices of BIRHAN for mother and Children morbidity and mortality Ethiopia program.

5.2 Conclusion

The general objective of this study is to assess factors affecting the humanitarian supply chain management practice of selected humanitarian organization implementing emergency mothers and children morbidity and mortality surveillance program in Ethiopia. The following conclusion is drawn. The empirical evidence indicates that humanitarian supply chain management practices have been applied by BIRHAN for mother and children and there are factors that affect humanitarian supply chain management practices.

The study also showed that the supply chain management practices are affected by earmarking of fund. Most of the respondents reported that influence of donors over where and how aid is distributed could negatively affects the distribution management practice of the organization. This includes inadequate and delayed of funds availability for disaster relief negatively affects the sourcing/procurement management practice of the organization. The earmarking of funds also breaches the humanitarian culture of impartiality by placing stipulations on how relief is administered negatively affects the distribution management practice of the organization.

The result shows that BIRHAN for mothers and children supply chain management practices are negatively affected by lack of skilled human resource. Lack of professionals including organized disaster response team in place to deploy and for emergency response program operation with the necessary training, awareness to effectively operate in the area negatively affects the distribution management practices of the organization. Unavailability of human resource with adequate

knowledge and skill of disaster relief operation also negatively affects the inventory management practices of the organization.

5.3 Recommendation

Based on the study findings, the researcher suggests the following points as recommendations to the problem.

- ❖ The grand mean of overall humanitarian supply chain management practices of BIRHAN for mother and children ($X=3.92$) is above neutral result point of 3.39 which shows that BIRHAN for mother and children has good overall supply chain management practices. Thus, BIRHAN for mother and children is recommended to keep the existing humanitarian supply chain management practices with some improvement of the inventory management practice accordingly.
- ❖ The findings in chapter four show that earmarking of fund ($\beta=432$), lack of skilled human resource ($\beta=.418$) and lack of supply chain relationships ($\beta=.302$) are critical factor affecting humanitarian supply chain management practices in BIRHAN for mothers and children. Therefore, BIRHAN for mothers and children and other humanitarian organizations are recommended to highlight more on the above-mentioned factors in general to create effective, efficient, and responsive humanitarian supply chain management practices in their organization.

5.4 Areas for Further Study

This research study attempted to concentrate on humanitarian supply chain management practices and factors that affect the humanitarian supply chain management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program. This research can be further investigated by looking for humanitarian Supply chain management practices and other factors that could affect the organization supply chain management practices. Thus, this research study gives recommendation for future researchers to explore if other factors like demand uncertainties, lack of information technology adoption and degraded infrastructure does not truly have a significant effect on humanitarian supply chain management practices.

REFERENCES

- Akkihal, AR., 2006. Inventory Pre-Positioning for Humanitarian Operations. Engineering Systems Division, Massachusetts Institute of Technology, Boston, MA.
- Alfarra,W.A, 2009. Analyzing Questionnaire Data using SPSS. Programs and Foreign Affairs Department, World Assembly of Muslim Youth.
- ARC Advisory group (2002). Operation Excellence in Supply Chain Management.
- Balcik, B., & Beamon, B. M., 2008. Facility location in humanitarian relief. *International Journal of Logistics: Research and Applications*. Vol. 11, No. 2,
- Ballou, R., 2000. *New managerial challenges from supply chain opportunities, industrial marketing management*. 7 ed. s.l.:s.n.
- Beamon, B. & Balcik, B., 2008. Performance measurement in humanitarian relief chains. *International Journal of Public Sector Management*, 21(1), pp. 4-25.
- Bell, E. and Bryman, A., (2007). The ethics of management research: an exploratory content analysis. *British journal of management*, 18(1), pp.63-77.
- Burns, R.P. and Burns, R., (2008). *Business research methods and statistics using SPSS*. Sage.
- Byman, Daniel and others. *Strengthening the Partnership: Improving Military Coordination with Relief Agencies and Allies in Humanitarian Operations*. Santa Monica: RAND, 2000.
- Caunhye, Nie & Pokharel., 2012. Optimization models in emergency logistics: A literature review, *Socio-Economic Planning Sciences*, vol. 46, pp. 4-13
- Chen, I. J. a. P. A., (2004). Understanding Supply Chain Management: Critical Research and a Theoretical Framework. *International Journal of Production Research*, 42(1), pp. 50-62.
- Christopher M., (2005). *Logistics and Supply Chain Management: Creating Value-Adding Networks*, (3rd Ed). London: FT Prentice Hall.
- Christopher, M. & Towill D., 2001. An integrated model for the design of agile supply chain. *International Journal of Physical Distribution & Logistics Management*, 31(4), pp.235-246.
- Chopra, S., Kalra, D.V. & Meindl, P. (2010). *Supply Chain Management: Strategy, Planning and Operation*. Fourth edition.
- Coyle, John J., 2003. *The Management of Business Logistics: A Supply Chain Perspective (7th Edition)*. Mason OH: South-Western/Thompson

- Davidson, A. L., (2006). *Key Performance Indicators in Humanitarian Logistics*, Massachusetts: Massachusetts institute of technology.
- Disaster Management Training Programme (DMTP). Logistics (1st ed.). New York: United Nations Development Programme/Department of Humanitarian Affairs, 1993.
- Döyen, Aras & Barbarosoglu, 2012. A two-echelon stochastic facility location model for humanitarian relief logistics, *Optim Lett.* vol.6: pp.1123-1145
- Family Planning Logistics Management/Jhon Snow, Inc. (2006). *The logistics Handbook: A practical guide for supply chain management in Family planning and health programs*. Arlington VA: Family Planning Logistics Management/Jhon Snow Inc. for the U.S. Agency for International Development (USAID).
- FIELD, A. P. 2005. K Wendall's Coefficient of Concordance. *Encyclopedia of Statistics in Behavioral Science*.
- Fritz Institute, 2005. From logistics to supply chain management: The path forward in the humanitarian sector. Retrieved from: www.fritzinstitute.org [15 November 2019]
- Fritz Institute, 2010. Humanitarian logistics white paper [Online] Available from <http://www.fritzinstitute.org> [October 28, 2019].
- Giunipero, L.C., Handfield, R.B., Monczka, R.M. & Petterson, J.L. (2009). *Sourcing and Supply Chain Management*. Fourth edition. Cengage Learning.
- Gooley, T. B., 1999. *In Time of Crisis, Logistics is on the Job.*” *Logistics Management and Distribution Report*,
- Gustavsson, L., 2003. Humanitarian logistics Context and Challenges. *Forced Migration Review*, Volume 18, pp. 6-8.
- Hines T. *Supply Chain Strategies*. (2004). Burlington, MA: Elsevier Butterworth-Heinemann.
- Korpela, J. a. T. M., 1996. Benchmarking logistics performance with an application of the analytic hierarchy process. 43(3), 323-333. *IEEE Transactions on Engineering Management*, 43(3), pp. 323-333
- Kothari, C.R., 2004. *Research methodology: Methods and techniques*. New Age International
- Kovacs, G. & S. K. M., 2009. Identifying challenges in humanitarian logistics. *International Journal of Physical Distribution & Logistics Management*, 39(6), pp. 506-528

- Kovacs, G., Spens, K., Aastrup, J. and Halldórsson, Á., 2008. Epistemological role of case studies in logistics. *International journal of physical distribution & logistics management*.
- Lee P, Yeung A, Cheng T., (2009). 120:190. Supplier alliances and environmental uncertainty: *An empirical study. International Journal of Production Economics*
- Li S, Rao SS, Ragu-Nathan TS, Ragu-Nathan B., (2005). 23:618. *Development, and validation of a measurement instrument for studying supply chain management practices. Journal of Operations Management*.
- John W Creswell, *Research Design: (2003.) “Qualitative, Quantitative, and Mixed-Method Approaches”*.
- Logistics Cluster-Logistics Operational Guide, 2011. Assessment and planning. [Online] Available from: <http://log.logcluster.org/response/assessment/index.html>, [29 December 2019]
- Long, D.C. & Wood, D. F., 1995. The logistics of famine relief. *Journal of Business Logistics*, 16 (1), pp. 29-213
- Lysons, K. & Farrington, B. (2006). *Purchasing and Supply Chain Management*. Seventh edition. Prentice Hall.
- Macrae, Joanna and others. *Uncertain Power: The Changing Role of Official Donors in Humanitarian Action*. Report to the Humanitarian Policy Group. London: Overseas Development Institute, December 2002.
- Mason K. and Leek S. (2009). “Learning to build a supply network: An exploration of dynamic business models”, *Journal of Management Studies*, Vol.45, pp.774- 99.
- Martinez, A.J.P., Stapleton, O. & Van Wassenhove L.N., 2011. Field vehicle fleet management in humanitarian operations: a case-based approach. *Journal of operations management*, 29(5), pp. 404-421
- Muller, M., 2011. *Essentials of Inventory Management*, 2nd Edition.
- Mugenda, O. & Mugenda, A., 2003. *Research Methods: Quantitative & Qualitative Approaches*. Nairobi, Acts Press.
- M Bashir, MT Afzal, M Azeem, (2008). *Pakistan Journal of Statistics and Operation Research* 4(1), January.
- McMillan, J. H., & Schumacher, S. (2006). *Research in education: Evidence-based inquiry (6th ed.)*. Boston, MA: Allyn and Bacon.

- Mwailu & Mercer, (1983), Wernerfelt, (1984); Rumelt, (1984); Penrose, (1959). Resource-Based View. Retrieved from the web April 14, 2015.
- Oloruntoba & Gray., 2006. Humanitarian aid: An agile supply chain? *Supply Chain Management: An International Journal*, 11 (2) pp. 115 – 120.
- Pan American Health Organization. (2004). *Manual Logistical Management of Humanitarian Supply*. Washington: PAHO.
- Humanitarian Supply Management and Logistics in the Health Sector. Washington: PAHO, 2001.
- Pettit, S. a. B. A., (2009). Critical success factors in the context of humanitarian aid supply chains.,39(6), 450-468. *International Journal of Physical Distribution Logistics Management*, 39(6), pp. 450-468.
- Rao, Raja, Peter, M., David, S. 2006. Procurement Strategies for Health Commodities: USAID, Arlington
- Ratliff, D., 2007. The challenge of humanitarian relief logistics. 34(6), p. 31.
- Russel, T., 2005. *The Humanitarian Relief Supply Chain: Analysis of the 2004 South East Asia Earthquake and Tsunami.*, Cambridge: s.n.
- Robert B. Handfield, Ernest L. Nichols Jr. (1999). "Introduction to Supply Chain Management". SAS/STAT. (2011). *Introduction to Survey Sampling and Analysis Procedures. SAS User's Guide*. SAS Institute Inc., Cary, NC, USA.
- Simatupang, T. M. a. S. R., (2002). The Collaborative Supply Chain. *International Journal of Logistics Management*, 13(1), pp. 15-30.
- Simchi-Levi, David and others. (2003). *Designing and managing the supply chain: Concepts, Strategies and Case Studies (2nd Ed.)*. New York: McGraw-Hill.
- Sowinski, Lara L. (June,2003). "The lean, Mean Supply Chain and Its Human Counterpart." *World Trade*, 18-20
- Stock, Gregory N., Greis, Noel P. &Kasarda, John D. (2009). *Enterprise Logistics and Supply Chain Structure: The Role of Fit. Journal of Operations Management* 18: 531-547.
- Thomas, A. (2003). Why logistics? *Forced Migration Review*, 18, 4
- Thomas, Anisya S. (2003). "Humanitarian Logistics: Enabling Disaster Response." Position paper, Fritz Institute, San Francisco, CA.

- Thomas, A.S. (2007). Humanitarian Logistics: Enabling Disaster Response. from <http://www.fritzinstitute.org/PDFs/WhitePaper/EnablingDisasterResponse.pdf>.
- Towill, D. & C. M., (2002). The supply chain strategy conundrum: To be lean or agile or to be lean & agile? *International Journal of Logistics: Research & Applications*, 5(3), pp. 299-309.
- UNOCHA, 2019. *Ethiopia Humanitarian fund annual report*
- Van der Vorst, J. G. A. J. & A. J. M. B., 2002. Identifying Sources of Uncertainty to Generate Supply Chain Redesign Strategies. *International Journal of Physical Distribution & Logistics Management*
- Van Wassenhove, L., 2006. Humanitarian aid Logistics: supply chain management in high gear. *Journal of the Operational Research Society*, 57(5), pp. 475-489.
- Vitasek, K., 2010. Supply Chain Management Terms and Glossary. [Online] available from: <http://cscmp.org/>[7th November 2019]
- Wright, J. Jones, D & Hoyle, S (2009). The Sustainable Supply Chain balancing cost, Customer service and sustainability to achieve a high-performance supply.
- Zikmund, W.G. (2003). *Business Research Methods*. 7th Edition, Thomson Southwestern, Ohio.

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APPENDICES

Appendix A: Questionnaire

Dear Participant,

This is Daniel Wassie, currently I am conducting a Research titled “factors affecting the humanitarian supply chain management practice of BIRHAN for mothers and children morbidity and mortality Ethiopia program” for the partial fulfillment of Degree of Master of Arts in Logistics and Supply Chain Management from the Addis Ababa University, School of Commerce. The information obtained from this questionnaire will be kept confidential and will not be used for any other purposes. There is no need to write your name, hence, you are kindly requested to answer to the questions openly.

I, thank you in advance for your cooperation, and honesty in answering the following questions.

Your sincerely,

Daniel Wassie

INSTRUCTIONS

1. In order to make the research outcomes complete, reliable, and fruitful, please complete the questionnaire by considering each question thoughtfully and honestly.
2. Your answers will be treated with the highest degree of confidentiality and data collected from this research will be used solely for academic purposes and will reported in aggregate.
3. Where answer options are available, please tick (√) in the appropriate space provided.
4. If you have any questions or dilemma, please contact me via Tel. +251911749043 or +251966736505 or Email: dannyhanman@gmail.com

PART 1: General Information

This section intends to gather general information on the background of the respondent and the organization.

1. Gender:

A. Female

B. Male

2. Age:

A. 18-25 years

B. 26-30 years

C. 31-40 years

D. above 40 years

3. Educational Qualification:

A. Below grade 12

B. Grade 12 completed

C. College Diploma

D. First Degree

E. Second Degree &

above

4. Position/Title in the organization:

A. Warehouse Assistant B. Transport Assistant C. Supply chain Assistant

D. Procurement Assistant E. Warehouse officer F. Transport officer

G. Supply chain officer H. Procurement officer I. Senior Warehouse officer

J. Senior Transport officer K. Senior Supply chain officer L. Senior Procurement officer M. ICT Officer N. Operation and Admin Manager O. Logistics Manager

P. Supply chain Manager Q. ICT Manager

R. Others (please specify) _____

5. How long have you been working in BIRHAN MCH Ethiopia Program?

A. Less than 2 Years B. 3-5 years

C. 6-10 Years D. Above 10 years

PART 2: General Questions

Section I: Sourcing/ procurement , inventory , transportation , warehouse/ facility location/ and distribution management practices of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.

	Strongly Disagree	Disagree	Indifferent	Agree	Strongly Agree			
	1	2	3	4	5			
Kindly indicate your level of agreement to the items by putting a tick mark (√) in the boxes provided. A scale of 1-5 is used to respond to the questions where								
1. Sourcing/ Procurement Management Practices				1	2	3	4	5
S/PM1	We have the practice of conducting initial need assessment shortly after the disaster strikes.							
S/PM2	We have the practice of quantifying the relief supplies required to meet needs of the affected population.							
S/PM3	We have the practices of reviewing the need for relief supplies to identify the stock of prepositioned supplies in the warehouse before determining the quantity of relief items to be procured from suppliers.							
S/PM4	We have the practices of preparing purchase request for the items that need to be procured from suppliers.							
S/PM5	We have the practices of preparing Request for Quotation to get price quotes from suppliers as per the required specification							
S/PM6	We have the practice of conducting comparative bid							

	analysis to identify the successful supplier based on the predefined selection criteria.					
S/PM7	We have the practices of placing purchase order to procure the relief supplies from successful suppliers.					
S/PM8	We have the practices of negotiation and contract management with suppliers.					
S/PM9	The organization effects payment for suppliers after goods are delivered to the warehouse as per the predefined specification and agreed up on terms and conditions.					
S/PM10	The organization maintains long term agreements with potential suppliers in order to improve supply capacity need during disaster occurrence.					
2. Inventory Management Practices		1	2	3	4	5
IM1	We have a practice of using Reception Note to receive relief items to the warehouse.					
IM2	We have the practice of using Delivery Notes to issue relief items to their destination.					
IM3	We use stock cards to know stock balance of relief items in the warehouse.					
IM4	We conduct regular stock count of inventory to determine the balance of relief items on hand.					
IM5	We have a procedure for timely disposal of obsolete and expired relief items.					
IM6	We track the stock inventory in the warehouse using the automated system.					

IM7	The organization maintains safety stock of inventory of relief items to quickly respond to disasters when they occur.					
3.Transport Management Practices		1	2	3	4	5
TM1	We have the practices of determining transport modes to deliver the relief supplies to affected area.					
TM2	We have the practices of deciding load capacity to fully utilize the transport facility to move relief supplies to their destination.					
TM3	We have the practices of scheduling the transportation of relief supplies to beneficiaries.					
TM4	We have the practices of tracking the movement of transport facilities while travelling to their destination.					
TM5	We have the practices of accompanying the freight with the waybill to ensure the legality of the consignment.					
4. Warehouse/Facility location Management Practices		1	2	3	4	5
W/FLM1	The organization locates warehouse facility at strategic places to quickly respond to disasters when they occur.					
W/FLM2	We have the practices of deciding the size, number and capacity of the warehouse facilities based on demand.					
W/FLM3	We have the practices of receiving relief supplies to warehouse after they are procured.					
W/FLM4	We have the practice of packaging the relief supplies to protect the relief items from damage.					

5. Distribution Management Practices		1	2	3	4	5
DM1	We practice definition of distribution points to minimize the distance to beneficiaries.					
DM2	We design the flow of materials for distribution keeping in mind the people who require it					
DM3	We practice distribution of supplies from central distribution centers					
DM4	We practice timely distribution of relief supplies to the beneficiaries					
W/FLM5	We have the practices of dispatching relief items to disaster areas.					
W/FLM6	We have the practices of using material handling equipment to load/unload the relief items					

Section II: Demand uncertainties, lack of information technology adoption, degraded infrastructures, lack of supply chain relationships, earmarking of funds and lack of skilled human resource are factors affected supply chain management of BIRHAN for mothers and children morbidity and mortality surveillance Ethiopia program.

	Strongly Disagree 1	Disagree 2	Indifferent 3	Agree 4	Strongly Agree 5	
Kindly indicate your level of agreement to the items by putting a tick mark (√) in the boxes provided. A scale of 1-5 is used to respond to the questions where						
1.Demand uncertainties		1	2	3	4	5
U1	Unpredictable supply regarding of inconsistent quantity, quality and lead time negatively affects the procurement management practices of the organization.					
U2	Unpredictable supply regarding of inconsistent quantity, quality and lead time negatively affects the transport management practices of the organization.					
U3	Unpredictable supply regarding of inconsistent quantity, quality and lead time negatively affects the warehouse management practices of the organization.					
U4	Unpredictable demand regarding of not knowing what, when and where will be required negatively affects the distribution management practices of the organization.					
U5	Unpredictable demand regarding of not knowing what, when and where will be required negatively affects the inventory management practices of the organization.					
2.Lack of information technology adoption		1	2	3	4	5

IT1	Unavailability of funds for necessary information technology adoption negatively affects the warehouse management practices of the organization.					
IT2	Limited investment in information technology negatively affects the sourcing/procurement management practices of the organization.					
IT3	Unavailability of information technology experts negatively affects the inventory management practices of the organization.					
IT4	Lack of advanced information technology tools during disaster response negatively affects the distribution management practices of the organization.					
3.Degarded Infrastructure		1	2	3	4	5
DF1	Degraded transport infrastructure (road infrastructure) negatively affects the transportation management practices of the organization.					
DF2	Inadequate transportation and communication infrastructure for relief supplies negatively affects the distribution management practices of the organization.					
DF3	Poor infrastructure for relief supplies negatively affects the procurement practices of the organization.					
DF4	Unavailability of communication infrastructure with disaster prone area negatively affects the inventory management practices of the organization.					

4.Lack of Supply Chain Relationship		1	2	3	4	5
SCR1	Lack of coordination among humanitarian supply chain actors negatively affects the Sourcing/procurement management practices of the organization.					
SCR2	Lack of coordination among humanitarian supply chain actors negatively affects the transport management practices of the organization.					
SCR3	Unavailability of skilled people specialized in the coordination/Relationship/ aspects negatively affects the inventory management practices of the organization.					
SCR4	Unavailability of virtual integration system to build supply chain integration negatively affects the distribution management practice of the organization.					
5. Earmarking of Fund		1	2	3	4	5
EF1	Influence of donors over where and how aid is distributed negatively affects the distribution management practice of the organization.					
EF2	Inadequate funds availability for disaster relief negatively affects the sourcing/procurement management practice of the organization.					
EF3	The earmarking of funds violates the humanitarian ethos of impartiality by placing stipulations on how relief is administered negatively affects the distribution management practice of the organization.					

EF4	Delayed of funding negatively affects the sourcing/procurement management practice of the organization.					
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6. Lack of skilled Human resource		1	2	3	4	5
HR1	Lack of professionals to deploy for relief operation with the required training, preparedness to effectively operate in the area negatively affects the distribution management practices of the organization.					
HR2	Unavailability of organized disaster response team in place negatively affects the sourcing/procurement management practices of the organization.					
HR3	Unavailability of human resource with adequate knowledge of disaster relief operation negatively affects the inventory management practices of the organization.					
HR4	Unavailability of professional with the required skill negatively affects the warehouse management practices of the organization.					

***** **THANK YOU FOR YOUR TIME AND COOPERATION*******

Addis Ababa
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(Since 1950)



**ADDIS ABABA UNIVERSITY COLLEGE OF BUSINESS AND
ECONOMICS, SCHOOL OF COMMERCE
DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT
Appendix B: Interview for heads of operations and administration division**

1. What major factors have been affecting your organization's supply chain management practice in humanitarian relief operation?

2. How was your organization's supply chain management being practiced during the last one-year humanitarian relief operation?

*******THANK YOU FOR YOUR TIME AND COOPERATION*******