



**JIMMA UNIVERSITY**

**FACULTY OF BUSINESS AND ECONOMICS**

**DEPARTMENT OF MANAGEMENT**

**FACTORS AFFECTING SUPPLY CHAIN PERFORMANCE IN HUMANITARIAN  
SECTOR: A CASE OF WORLD VISION ETHIOPIA**

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## DECLARATION

I declare that this thesis is the result of my independent research work on the topic entitled as Factors Affecting Supply Chain Performance in Humanitarian Sector: A case of World Vision Ethiopia in partial fulfillment of the requirements for the Degree of Master in Business Administration at Jimma University. It is my original work and all the references used in the study are acknowledged.

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## **Abbreviations and Acronyms**

**CSCM** Commercial supply chain management

**DFAP** Developmental food assistance program

**FDP** Food distribution point

**FFP** Food for peace

**JEOP** Joint emergency operation

**HA** Humanitarian agencies

**HO** Humanitarian organization

**HSCM** Humanitarian supply chain management

**NGO** Nongovernmental organization

**SC** Supply chain

**SCM** Supply chain management

**SCI** Save the children international

**PDP** Primary distribution point

**USAID** United States agency for international development

**3PL** Third part logistics.

## **ABSTRACT**

*The main objective of this research is to assess the existing Humanitarian Supply Chain performance as a case study of World vision Ethiopia, which is a non-governmental organization. The study used quantitative research approaches. This is because the study primarily focused on the data collected through questionnaires to give condensed pictures of the data by using SPSS. The study used both descriptive and explanatory research design. The study data were collected from both primary and secondary data sources. In order to collect the primary data, the study employed questionnaire as instrument of data collection. The study data was analyzed using descriptive and inferential statistical analysis techniques using SPSS software package in the entire analysis part. In order to reduce the possibility of getting the wrong answer, reliability and validity tests was conducted with a due attention. Among the investigated factors to have effects on HSC Performance, humanitarian Supply Chain Planning, followed by transporters' availability, efficiency and management were identified as the main factor affecting the HSC Performance of the organization by getting the highest tendency of agreement level towards its overall dimension.*

**Key Words:** *Supply Chain Planning, Communication, Coordination, Transportation, Infrastructure, Humanitarian Supply Chain Performance.*

# CHAPTER ONE

## INTRODUCTION

### 1.1 Background of the study

The humanitarian supply-chain management (HSCM) involves managing the different interrelated factors important for the effectiveness of the humanitarian operation system such as goods and materials, information, manpower, political authorities and available infrastructure to reduce the impact of a disaster for the people who are affected (Torre, L.de, et al, 2011). In the same document, they underlined the fact that the HSCM and the commercial supply-chain management are different in their motives and the realms at which they operate. While the driving force behind commercial supply chain management is basically profit maximization, efficiency & business long term growth that of HSCM is mainly reducing human suffering & rehabilitation of disaster affecting people in timely manner (Kopczak, 2005). As a result disaster relief operations requires the activities in many dimensions, such as, rescue efforts, health and medical assistance, food, shelter and long-term relief activities in coordinated & effective manner. The success of any relief activity depends heavily on the effectiveness of the logistics operations of the supply delivery. However, despite the fact that the logistics operation is the heart of the entire relief activities, it was not until recent times the importance of the logistics was identified (Torre et al, 2011).

According to Mentzer (2001) describe the humanitarian supply chain as the network created through the flow of services, supplies, information and finances between donors, beneficiaries, suppliers and different units of humanitarian organizations, in order to provide physical aid to beneficiaries. The goal of the supply chain is to deliver the right supplies, in the right quantities to the right location at the right time (Shepherd & Gunter, 2006). Therefore, disaster relief organizations need to move relief goods more quickly and effectively so that victims can be saved.

Thomas and Kopczak, (2005) confirmed that there is evidence that a growing number of natural and manufactured disasters happen all around the world, affecting hundreds of millions of people every year. In spite of this fact, only in these years starting from 2005 has supply chain management performance for humanitarian aid and disaster relief been a topic of interest for

researcher. Consequently, the academic literature in this field is comparatively new and still sparing, indicating a requirement for more academic studies in this field.

On the other hand, the humanitarian supply chain (HSC) network is very similar to business supply chain network but the objective and parameters to measure HSC network performance are different (Kovacs & Spens, 2007). A business supply chain network aims to maximize *supply chain surplus*, whereas a HSC network aims to provide maximum relief to the victims of an undesirable and unpredictable event (Petti & Beresford, 2006; Trunick, 2005). The challenge of any HSC network is heavily purpose-driven and human life driven. However, the complexity of the network depends upon the nature of materials that is needed to be supplied to disaster-hit areas, which is almost uncertain from both the demand and supply end. In humanitarian aid activities, delays in delivery or relief can cost lives. Therefore, efficiency in logistics is a key factor as it ensures the smooth flow of goods and services in a complex supply chain system.

In relation to HSCM in Ethiopia, the emergence & development programs are implemented the occurrence of the major food crises happened in 1950's which claims the life of many Ethiopians affected due to drought. Since, Ethiopia has been facing recurring drought and famine due to environmental, social and political factors which subject the large segment of the rural population to vulnerability and food insecurity to the country. To assist these droughts affected peoples, Save the Children has been working both emergency and development programs in different areas of the country. Save the Children in collaboration with Government of Ethiopia has been implementing both DFAP and JEOP programs in 7 Woredas of Oromia and Somali since October 2011. The program is a USAID Food for Peace (USAID/FFP) funded five year programs. The operational areas include Afder and Liben zones of Somali and Borena zone of Oromia. The targeted beneficiaries of the programs are chronically food insecure households in chronic food insecure villages and Woredas of the zone as targeted, registered and monitored by the government of Ethiopia (USAID, 2017).

In HSCM, unlike the "financial" objectives of CSCM, the primary goal for HSCM is to minimize human suffering more specifically to prevent further loss of life and harm to humans, as well as provide immediate treatment to those with injuries and illness (Beamon and Balcik, 2008). Now a day, this area attracted the attention of both academics and practitioners (Dubey, 2015). Hence, this is the main area of this study focusing assessment of humanitarian supply chain performance of World Vision international Ethiopia.

## **1.2 Statement of the problem**

The study of supply chain performance for humanitarian aid and disaster relief sector is the most significant issue for developing and implementing a successful humanitarian supply chain strategy. Furthermore, as logistics and supply, chain is central to relief operations and the most expensive part of any relief operation, identifying the factors that affect the performance of relief chains has become vital for all organizations involved in disaster management.

The primary focus of the existing literature is on business-oriented supply chain, i. e on managing commercial supply chain that aims at improving the profit-making supply of goods and services. Despite being an important and emerging domain of supply chain, the humanitarian relief supply process rarely got a due attention." (Beamon, 2004). Beyond that, regardless of its undeniable importance, much is hardly known about supply chain performance and associated factors as most studies remained focused on industrial sector with intentions of improving efficiency and profit making. These seem to be there are theoretical and observational gaps and call for a deep assessment of the factors that affect NGOs" supply chain performance that need to be investigated, but yet due to varying contexts, the findings of such studies may not necessarily apply in all humanitarian SC.

Once factors identified, performance measurement is critical to NGO accountability. Beamon (2004) and Van Wassenhove, (2006). Lindenberg and Bryant (2001) state: "As resources become tighter, NGOs face new pressures for greater accountability for program impact and quality. The increased frequency and scale of disasters, scarce resources, funding competition, and the need for accountability require more efficient, effective and transparent relief operations. Therefore, measuring the performance of relief chains has become vital for all organizations involved in disaster management. On the other hand, Balcik and Beamon (2008) stated that given the stakes and size of the relief industry, the study of humanitarian relief chains is an important domain for supply chain management that has received little attention. Moreover, despite its significance, performance measures and measurement systems have not been widely developed and systematically implemented in the relief chain due to the uniqueness and complexity of disaster relief environment.

Logistics is the most important element in any disaster relief effort, and it is the one that makes the difference between a successful and a failed operation (Wassenhove, 2006). Thus, proper investment in logistics in disaster relief provides the main opportunity to develop and implement effective and efficient use of resources in humanitarian operations (Cozzolino et al., 2012). In addition, a more strategic use of resources allows humanitarian organizations to raise donor trust and long-term commitment by increasingly skeptical benefactors (Scholten et al., 2010). Humanitarian organizations are therefore under greater scrutiny to monitor the impact of aid and the arrangement of their entire operations; they have to prove to donors, who are pledging millions in aid and goods, that they are really reaching the ones in need (Wassenhove V., 2006).

Supply Chain Performance refers to seeking operational excellence to deliver leading customer experience and requirement (Simchi-Levi et al., 2003). In this, two points are of paramount importance; the degree to which the vowed goal is met- effectiveness and efficiencies that can get us the sought performance. As an effort to formulate strategic and efficient use of scarce resources that are mainly obtained from donors, to effectively manage the logistics- the most important and expensive element of any disaster relief and to set sound human supply chain strategy, it is important to identify the factors affecting supply chain performance of non-governmental organization in a case of World Vision Ethiopia. This study focuses on World vision international humanitarian supply chain management of DFAP and JEOP programs. The supply chain of the 2 programs involves the transaction from purchase order or call forward of the food, shipment of the food from source country (USA) to the delivery of the food to end users (FDPs) in the Woredas. The programs are handling and managing a total of 65,000 Metric tons (650,000 quintals) of wheat, Sorghum, YSP, Vegetable Oil commodities that distribute to targeted beneficiaries per Year. The management of this huge quantities of commodities needs highly informed, well-coordinated and integrated, supply chain management of warehouses, planning, coordination, transportations and collaboration with partners and staffs at all level.

In addition to data collected through the review of the documented materials from the department supply chain, direct observation was conducted to gather data from the relevant work unit such as warehouse, procurement, logistics, Finance and Food Aid Program of the organization. It was noted that lack of sound and proactive planning is a problematic to respond to uniquely unforeseen demand from the customers, interrupted inter and intra organization communication,

lack of well-mannered coordination and integration to work against common goal, transporters unavailability to reach the and save the lives of distant victims and infrastructure related issues were assessed to have effect on the supply chain performance of the organization.

It is quite unimportant to question the obvious! The realization of the goal of donor funded projects in NGO heavily depends on the formulation of sound supply chain management practice. The matter of interest that needs to be addressed is as to which specific factors greatly affect the supply chain performance. Though some studies (Henry Quesada.et.al 2012) shows and point out different factors affecting SCP of manufacturing and industrial sector as stated before, in this research paper the main focus will be what are factors that affect supply chain performance in non-governmental organization particularly the selected organization, World Vision Ethiopia. To address this question, the study focused on the effect of HSC Planning, Communication, Coordination, transportation and infrastructure factors. The researcher was convinced that the weakness noticed on selected and observed areas of the supply chain department and other support departments were believed to have effects on the performance of the entire supply chain management.

According to Torre et al (2011) the humanitarian supply-chain management (HSCM) involves managing the different interrelated factors important for the effectiveness of the humanitarian operation system such as goods and materials, information, manpower, political authorities, available infrastructure & etc. to reduce the impact of a disaster for the people who are affected. In the same document they underlined the fact that the HSCM and the commercial supply-chain management are different in their motives and the realms at which they operate. While the driving force behind commercial supply chain management is basically profit maximization, efficiency & business long term growth that of HSCM is mainly reducing human suffering & rehabilitation of disaster affecting people in timely manner. As a result, disaster relief operations requires the activities in many dimensions, such as, rescue efforts, health and medical assistance, food, shelter and long-term relief activities in coordinated & effective manner. The success of any relief activity depends heavily on the effectiveness of the logistics operations of the supply delivery. However, despite the fact that the logistics operation is the heart of the entire relief activities, it was not until recent times the importance of the logistics was identified (Torre et al, 2011).

### **1.3 Basic Research Questions**

The basic research questions of this study are:

- What are the effects of planning on the organization's supply chain performance?
- What are the effects of inter-intra organization communication on the organization's humanitarian supply chain performance?
- What are the impacts of coordination with staffs and partners and other NGOs on the humanitarian supply chain performance of the organization?
- What are the effects of infrastructure factors on the supply chain performance of WVE?
- What are the effects transportation facilities related factors on the humanitarian supply chain performances of the organization?

### **1.4. Objectives of the Study**

#### **1.4.1 General Objective**

The general and main objective of this research is to identify the factors that affect the existing Humanitarian Supply Chain performance of humanitarian sector, making World Vision Ethiopia as a case study.

#### **1.4.2 Specific Objectives**

The specific objective of the study is:

- to investigate the effect of the organization's supply chain planning on its humanitarian supply chain performance;
- to assess the impact effects inter-intra organization communication on the organization's humanitarian supply chain performance
- to investigate the effect of coordination with staffs, partners and other NGOs on the organization's humanitarian supply chain performance;
- to elaborate effects of infrastructure factors on the organization's humanitarian supply chain performance;



- to assess the effects of transportation facilities related factors on the humanitarian supply chain performances of the organization;

### **1.5. Significance of the Study**

This research is aimed at assessing the factors that affect the humanitarian supply chain performance in non-governmental Organization with taking World Vision Ethiopia as a case study. The outcome of the study will be helpful to humanitarian organizations that have been currently implementing development and emergency food aid programs in Ethiopia and other organizations that are implementing humanitarian relief operations in the country by providing information on those factors that affect supply chain performance of the selected organization based on the result of this study.

The research is also expected to be used as a reference for future researchers who will be interested to study the topic and hoped to contribute its part in filling the knowledge gaps.

Moreover, in Ethiopia the study of humanitarian supply chain management has not been sufficiently conducted, so the result of this study will help to better understanding of the process of HSCM practices in development and emergency food aid assistance programs.

### **1.6 Scope of the Study**

Supply chain management has a wide scope and includes a lot of theories about how to set up the chain yet, this study did not go through details regarding everything include in the term supply chain management. This study was confined only to assessing the factors that affect humanitarian supply chain performance of World vision Ethiopia. This was mainly attributed to HSC planning, Communication, Coordination, Transportation and Infrastructure because of wide scope of the organization operational and geographical coverage.

### **1.7 Limitation of the Study**

This study was not completely free from constraints. Because of shortage of time and resources, the study did not cover all issues related to assessing factors affecting Humanitarian Supply Chain performance.

### **1.8 Organization of the Paper**

Generally, the paper was organized into five chapters. The first chapter presents background followed by statement of the problem, objective of the study and research question, significance

of the study, scope of the study and limitation of the study. The second chapter deals with literature review which shows a review of related topics for the research and conceptual framework of the study with operational definition. The third chapter is a research methodology which includes research design, source population, study population, sample design, data collection instrument and administration, data management, data processing procedures and ethical consideration. The fourth chapter handles data analysis, result and discussion. The fifth chapter wind ups the paper by summarizing the major findings giving conclusion, recommendation, by listing limitation of the study and by giving suggestions for further study

## CHAPTER TWO

### 2. RELATED LITERATURE REVIEW

#### 2.1. Introduction

This chapter briefly introduced and provided a systematic literature review on the works of various scholars in the area of SCM and SC performance in humanitarian organization. It includes definition and concepts such as, humanitarian supply chain management, humanitarian supply chain performance, humanitarian supply chain versus commercial supply chain, HSC sourcing, Internal and external coordination, flow of aid materials, funds, people and information, access and last mile distribution; empirical review related to the topic of the study and conceptual framework.

Based on the literature reviewed, this thesis sought to compose and evaluate those research questions and identifies measurement variables which are used for answering those research questions in designed to assess humanitarian supply chain performance of World vision Ethiopia.

#### 2.2. Humanitarian Supply Chain Management

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

Humanitarian supply chain involves components such as procurement, transportation, warehousing, inventory management, tracing and tracking, bidding and reserve bidding, reporting and accountability to address emergency needs (Mbohwa, 2006). It involves flow of relief from the donor to the beneficiaries. There is need to coordinate and manage disaster supply chain to ensure that humanitarian organizations gain from the benefits of having a supply chain system in place. The humanitarian supply chain would ensure that even in times of emergency, the humanitarian organizations receive value for money in procurement of goods and services. Humanitarian organizations that have an effective SCM system in place benefit from

transparency of all phases in the procurement process are fair and accurately documented. This contributes to the establishment of sound and reliable business relations with suppliers; accountability to donors who may require certain rules to be followed when using the money, they have provided. This ensures that expenses incurred are accepted by the donor and no funds are disallowed; efficiency and cost effectiveness meeting the six rights of supply; right price, right time, right quantity, right quality, delivery to the right places and from the right source/supplier. This has an impact on the operations of the organization and on the beneficiary. When disaster strikes, relief organizations respond by delivering aid to those in need, quickly and effectively. Their supply chains must be both fast and agile, responding to sudden disasters. A disaster response operation involves trade-off of speed, cost and accuracy with regard to the type of goods that are delivered and the quantities (Mbohwa, 2006).

Humanitarian operation is divided into two; development and emergency. The NGOs operate in development sector or emergency sector. Some however, operate in both sectors by having a department that deals in development and one that deals in emergency. The development sector includes activities that take place over a long period of time (longer than one year) while emergency sector deal with short term activities mainly during disasters.

Humanitarian Supply Chain Management is referred to as the process of effective and cost-efficient plans, implementations and controls for aid flows (i.e., materials, goods, services, financial resources, information, etc.) from the point of origin to the point of consumption with the intention of meeting the aid recipients' requirements (Thomas and Kopczak, 2005 ; Day et al., 2012; etc.).

On the other hand, Thomas and Kopczak, (2005) defined humanitarian logistics as “the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from point of origin to point of consumption for the purpose of meeting the end beneficiary’s requirements” and alleviating the suffering of vulnerable people. Except for its focus on the end beneficiary, this definition is largely comparable to any definition of business logistics.

According to Thomas and Kopczak, (2005) there is evidence that a growing number of natural and man-made disasters happen all around the world, affecting hundreds of millions of people every year. In spite of this fact, only in these years starting from 2005 has supply chain management for humanitarian aid and disaster relief been a topic of interest for researchers.

Consequently, the academic literature in this field is comparatively new and still sparing, indicating a requirement for more academic studies in this field.

### **2.3. Humanitarian Supply versus Commercial Supply Chain**

The ultimate goal of any supply chain is to deliver the right supplies in the right quantities to the right locations at the right time. Supply chains comprise all activities and processes associated with the flow and transformation of goods from the raw material stage through the end user (Shepherd and Gunter, 2006).

Similar to a commercial supply chain, supplies flow through the relief chain via a series of long haul and short haul shipments. Supplies flowing through the relief chain primarily consist of pre-positioned stocks in warehouses, supplies procured from the suppliers, and in-kind donations. Supplies are shipped from various worldwide locations to a primary warehouse, which is usually located near a sea or airport. Next, supplies are shipped to a secondary hub (a large, permanent warehouse typically located in a larger city). At this secondary hub, supplies are stored, sorted and transferred to tertiary hubs (local distribution centers). Finally, local distribution centers deliver relief supplies to beneficiaries. Supplies acquired from local sources may also be stored at secondary and tertiary warehouses, or directly distributed to the beneficiaries.

Scholars have clearly pointed out, that in spite of similarities, there are dissimilarities between commercial supply chain and HSC network. The business supply chain network is driven with an objective to maximize supply chain surplus; on the other hand, the HSC network is driven with an objective to reduce the potential loss of human and infrastructure (pre-disaster) and provide maximum relief and ensure quick recovery during the post-disaster phase (Holguin-Veras et al., 2012). The commercial supply chain aims to generate maximum supply chain surplus without compromising service level (Pettit and Beresford 2006), whereas HSC is driven by non-profit objectives. The aims of the HSC are to provide maximum relief to the affected victims in terms of medical aid, food, shelter and drinking water.

### **2.4. Humanitarian supply chain performance**

According to Poister (2003) explains the importance of performance measurement of humanitarian nonprofit sector. “Effective performance measurement systems can help nonprofit managers make better decisions, improve performance, and provide accountability. Moreover,

when they are designed and implemented effectively, performance measures provide feedback on agency performance, and motivate managers and employees to work harder and smarter to improve performance. They can also help allocate resources more effectively, evaluate the efficacy of alternative approaches, and gain greater control over operations, even while allowing increased flexibility at the operating level”. In addition “effective performance means undertaking work in ways that are consistent with humanitarian principles, mobilizing and deploying sufficient financial, material and human resources in ways that are relevant, well-managed, accountable, impartial, durable and ensure good quality”(Bolsche, 2013)

Donors increasingly demand accountability, transparency and value for money in return for their sponsorship of humanitarian aid agencies (Scholten et al., 2010). They have great interest in knowing how successful an organization is in accomplishing its goals with the resources they have provided. According to a (2009) Oxfam report aid should be relevant, of good quality, well managed and should be accountable with mechanisms to challenge failure and abuse. It should also build durable solutions and be sufficiently resourced. This emphasizes why mechanisms for measuring performance of humanitarian organizations are of great importance. Though, NGO’s may have multiple stakeholders whose priorities differ therefore making it difficult to define humanitarian organizational performance (Pavicic et al., 2014).

Humanitarian supply chain performance is measured in four aspects delivery, reliability, flexibility and responsiveness (Jane.K et al., 2013). In humanitarian actions, delays in delivery or relief can cost lives. Therefore, efficiency and reliability in supply chain is a key success factor, because it ensures the smooth flow of goods and services. To save lives and alleviate suffering, the response to international emergencies must be timely, effective, appropriate, and well organized.

#### **2.4.1. HSC Performance measures and measurements**

Humanitarian supply chain performance will be measured in terms of time of delivery, quality of delivered materials, reduction in loss of lives, reducing stock-out of necessary medicines, equipment and other necessary items, best use of donated items. Thomas, A. (2003).

Performance measurement is critical to NGO accountability (Beamon, 2004). Lindenberg and Bryant (2001, p. 209) state: “As resources become tighter, NGOs face new pressures for greater accountability for program impact and quality. Today, contributors, donor agencies, scholars,

and relief and development practitioners are all asking: do NGOs practice what they preach? How do we know? How effective are their programs and projects?” The increased frequency and scale of disasters, scarce resources, funding competition, and the need for accountability require more efficient, effective and transparent relief operations. Since logistics is central to relief operations and the most expensive part of any relief operation (Van Wassenhove, 2006), measuring the performance of relief chains has become vital for all organizations involved in disaster management.

Given the stakes and size of the relief industry (the largest relief organizations engage in billions of dollars’ worth of relief and development activities per year), the study of humanitarian relief chains is an important domain for supply chain management that has received little attention. Moreover, despite its significance, performance measures and measurement systems have not been widely developed and systematically implemented in the relief chain. Various factors make performance measurement a challenging task for NGOs. Particularly due to the difficulties associated with measuring program outcomes and impacts in humanitarian relief, NGOs tend to measure performance focusing on inputs rather than outputs. This is common in the nonprofit sector (O’Neill and Young, 1988).

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

## **2.5 Infrastructure Situational Factors**

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

## **2.6 Transport**

Transportation makes it possible for assistance to reach those in need (Jane.K et al., 2013). Transportation in a disaster or humanitarian emergency can run the gamut. It can involve global sourcing, drop shipment, military transport, commercial transport, non-commercial transport,

third-party logistics firms, freight forwarders, charter aircraft, or even local transportation such as mules and donkeys. Goods are often brought into a country at an entry point and then moved to collection sites run by relief organizations. In relief work, both in disasters and complex humanitarian emergencies, damaged infrastructure, inaccessible infrastructure, and the lack of infrastructure needed for large-scale assistance lead to bottlenecks, delays, and congestion at entry points to the disaster area.

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

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

## **2.7 Internal/External Coordination**

Further, the coordination within an NGO and outside with the other stakeholders is deemed pivotal for the success of humanitarian aid operations. On the sourcing end, the coordination between an NGO and its donors can be demanding due to the importance of donations to an NGO's operations as well as the heterogeneity of goals from different groups of donors. At the same time, within a humanitarian supply chain, the coordination between an NGO and other players (e.g., other NGOs, governments, etc.) is complicated due to the unique characteristics of this system. For instance, when a major disaster happens, usually there are thousands of disaster relief organizations participating in the relief activities. This would make the coordination far too complex. For instance, the number of NGOs operating in Haiti after the 2010 earthquake was estimated to be between 3,000 and 10,000; the OCHA directory of registered NGOs and their



key contacts is 82 pages long (Tatham and Pettit, 2010). In addition, the coordination within humanitarian supply chain is extended to other fields such as governments, militaries, other NGOs, etc... All these facts have made the coordination very challenging for any NGO that participated during the earthquake. It is worth mentioning that trust and information are two key success factors for the coordination within this system. Both factors have gained academic researchers' attention and there exist two streams of literatures focusing on trust (Tatham and Kovacs, 2010) or/and information (van der Laan, 2009).

## **2.8 Communication and Information**

Regardless of the type of uncertainty affecting the humanitarian supply chain, information management can help to reduce the complexity brought about by uncertainty. That is what several initiatives driven by the humanitarian agencies attempt to do through designing a common language, increasing visibility, and promoting collaboration. Disaster relief operations are carried out by humanitarian agencies who, unlike private companies, do not share the same explicit profit incentives to collaborate and exchange information. Information management can help increase visibility and foster transparency in the humanitarian supply chain. Overall, agencies investing in information management can help facilitate the response by creating greater visibility of the needs and more accountability among the different actors involved.

In the typical commercial supply chain framework, three types of flows occur (i.e., materials or goods/services, information, and finance). This is also the case within humanitarian supply chain. In Mentzer et al.'s (2001) framework, the information flow is bi-directional while the financial flows occur from the customer to the upstream suppliers, and the goods flow from upstream down to customers. In this study, the aid elements (e.g., goods/services and funds) are constructed as flowing out to affected areas whereas information and people are bi-directional. The component of "sourcing" which purposely emphasize generates the unidirectional input flows for the humanitarian supply chain system. Similar to commercial supply chains, bi-directional information flow is necessary for humanitarian supply chains. It is worth mentioning that "people" is one of the crucial aid flow elements in NGOs' humanitarian operations management. When a disaster takes place, the NGOs' field staff near the affected region would always involve in the aid activities; also, sometimes NGOs' personnel from other areas (including head office) as well as volunteers are sent to the affected area; while on the other hand, some people in the affected area would be shipped out from the affected region. Most of

the volunteers (or other relief activity participants) will step away from the affected region sooner or later.

## **2.9 Access and Last Mile Distribution**

Distribution management is another essential part for humanitarian aid management. Distributions take place through the entire system and distribution management features aspects ranging from demand management to logistics. However, the affected area becomes the focus of the whole system as soon as a disaster strikes.

An NGO involved in the aid activities must forecast the demand from the disaster region; it then needs to expeditiously decide the quantity of resources needed (aid materials, funds, and people) and how to quickly make delivery. To augment the efficiency and effectiveness of distribution, the NGO is supposed to coordinate with the related stakeholders, including third party logistics providers (3PLs), suppliers, governments, militaries, volunteers, donors, aid recipients, other NGOs, among others. The humanitarian aid delivery, especially the last mile distribution, during emergent disaster period has been deemed far more challenging compared to the delivery in commercial supply chains due to factors such as the unreliability of the transportation system in the disaster zone (beamon and Balcik, 2008).

## **2.10. Empirical Review**

Delivery of humanitarian services to beneficiaries is one of the most critical operations of HO-LSCM which known as last mile delivery [Balcik et al. 2008]. The focus of last mile delivery is the fleet system used to transport the goods, material and people [Apte2009]. For HOs, fleet management is the second largest overhead cost, being 15% of the total humanitarian relief logistics cost [Falasca,Zobel 2011, Martinez, Stapleton, Van Wassenhove 2011]. Plans and policies on sourcing and allocation of vehicles by HOs can be suddenly rendered irrelevant on real grounds: the occurrence of natural disasters usually cannot be predicted. This is the nature of such disasters, and local, social, political, safety and security scenarios for the relief mission demands different types of vehicles: heavy duty equipment, 4WD vehicles, or light duty vehicles. In one case study, most of the vehicles were not usefully deployed according to the demands of that HO's mission because95% of the vehicles were light duty, and not useable [Eftekhari, Van Wassenhove 2016].

In HO supply chain operations, the “Plug and Play” concept, whereby processes and actions can be immediately instituted in an emergency situation, particularly temporary supply chain management (TSC) processes, is only possible through a well-coordinated, efficient and effective flow of information [Merminod et al., 2014]. During the humanitarian response, prioritization of needs is the most important factor for assessment of required resources, implementation of immediate solutions and to decide on the necessary shift from the effectiveness management to efficiency management [Merminod et al., 2014, Tomasini, VanWassenhove, Van Wassenhove 2009]. Thus, humanitarian organizations need to prioritize these demands and to implement an immediate solutions as per available resources [Tomasini, Van Wassenhove, 2009].

In recent years, some scholars have called for a different community, which has recently become known as humanitarian logistics and supply chain management (Van Wassenhove, 2006; Dubey, R., & Gunasekaran, A. 2015). Contributions from the humanitarian supply chain community are increasing as they attempt to delineate humanitarian logistics and supply chain from the established field of commercial supply chains.

Scholars have clearly pointed out, that in spite of similarities, there are dissimilarities between commercial supply chain and HSC network. The business supply chain network is driven with an objective to maximize supply chain surplus; on the other hand, the HSC network is driven with an objective to reduce the potential loss of human and infrastructure (pre-disaster) and provide maximum relief and ensure quick recovery during the post-disaster phase (Holguin-Veras et al., 2012). The commercial supply chain aims to generate maximum supply chain surplus without compromising service level (Pettit and Beresford 2006), whereas HSC is driven by non-profit objectives. The aims of the HSC are to provide maximum relief to the affected victims in terms of medical aid, food, shelter and drinking water.

The researcher has thus tried to differentiate HSC from the commercial supply chain as follows:

- HSC is guided by non-profit objectives, whereas the commercial supply chain is guided by a profit objective (Bhattacharya, Hasija, and Van Wassenhove 2014).
- The humanitarian logistics involved in relief chains is primarily reactive, guided by the ad hoc design; however, for a successful operation, it requires extensive advance planning, which has three main foci: preparedness, response and collaboration (Balcik et

- al. 2010); (Tomasini and Van Wassenhove 2009; Bhattacharya, Hasija, and Van Wassenhove 2014). The logistics involved in commercial supply chains, in contrast, vary between proactive and reactive, guided by four factors: quality, cost, time and risk.
- One major difference between the two types of chains is the demand pattern. For many commercial supply chains, the external demand for products is comparatively stable and predictable. Often, for the commercial chain, the demands seen from warehouses occur from established locations in relatively regular intervals. However, the demands in the relief chain are emergency items, equipment, and personnel. More importantly, those demands occur in irregular amounts and at irregular intervals and occur suddenly, such that the locations are often completely unknown until the demand occurs (Thomas and Kopczak, 2005; Van Wassenhove, 2006).

On the other hand, performance measurements for the humanitarian sector have been developed where most frameworks (de Leeuw, 2010; Schulz and Heigh, 2009; Moe et al., 2007) are based on the balance score card introduced by Kaplan& Norton (1992). However, Davidson (2006) saw the balance score card unfit for the humanitarian sector due to the rigidity of the framework and the complexity of the humanitarian context.

Even though there is a limited body of existing knowledge in the area, a recent exception is the research conducted by Davidson (2006) ; Whitten et al. (2012); and Dubey et al (2015) proposing a performance measurement framework of relief logistics. Accordingly, Davidson (2006) develops a performance measurement framework for relief logistics for the International Federation of Red Cross and Red Crescent Societies and describes an application of the framework to actual relief operations. The proposed framework relies upon four performance metrics, namely appeal coverage, donation-to-delivery time, financial efficiency, and assessment accuracy. Whitten et al. (2012); and Dubey et al (2015) extended and further empirically investigated Triple A supply chain performance framework (Agility, Adaptability and Alignment,) proposed by Lee (2004) for measuring humanitarian supply chain performance. However, the concept of agility, adaptability and alignment remains in its infancy (Whitten et al. 2012) and requires further investigation – and, from a sustainable humanitarian supply chain perspective, it is an area that requires urgent attention.

According to Torre et al (2011) the humanitarian supply-chain management (HSCM) involves managing the different interrelated factors important for the effectiveness of the humanitarian operation system such as goods and materials, information, manpower, political authorities,

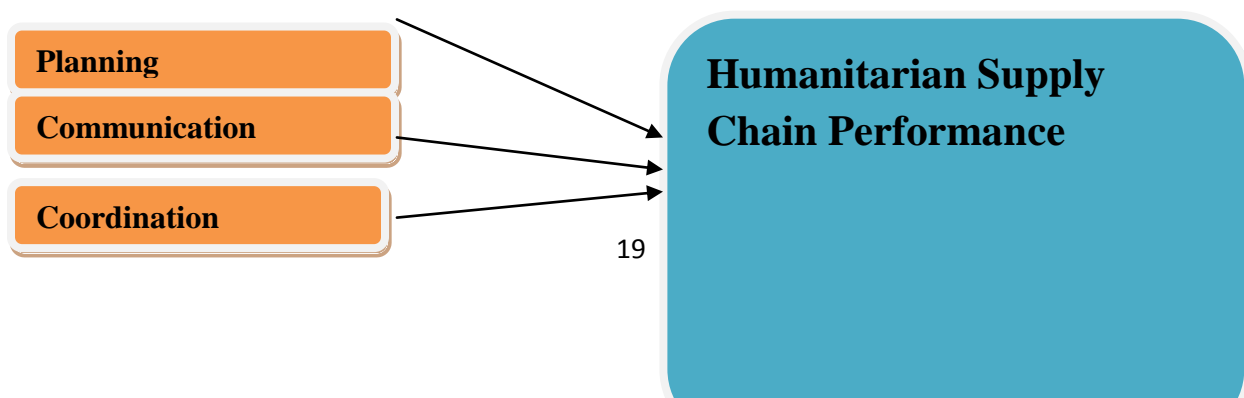
available infrastructure & etc. to reduce the impact of a disaster for the people who are affected. In the same document they underlined the fact that the HSCM and the commercial supply-chain management are different in their motives and the realms at which they operate. While the driving force behind commercial supply chain management is basically profit maximization, efficiency & business long term growth that of HSCM is mainly reducing human suffering & rehabilitation of disaster affecting people in timely manner. As a result, disaster relief operations requires the activities in many dimensions, such as, rescue efforts, health and medical assistance, food, shelter and long-term relief activities in coordinated & effective manner. The success of any relief activity depends heavily on the effectiveness of the logistics operations of the supply delivery. However, despite the fact that the logistics operation is the heart of the entire relief activities, it was not until recent times the importance of the logistics was identified (Torre et al, 2011).

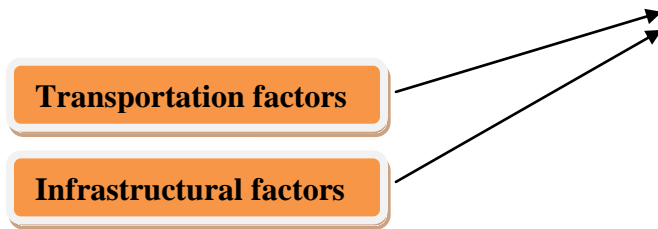
## 2.10 Conceptual Framework

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

The independent variables were investigated with a view to finding their effect on supply chain performance in humanitarian response of World Vision Ethiopia. As an international Humanitarian organization, World Vision is operating in an environment where different stakeholders, processes and flows exist to assist it to get to its ultimate goal.

In order to understand the end-to-end supply chain, it is believed by the study to take a step in mapping the Supply chain frame work of the organization so it will be better to illustrate the network structure and as built working processes. The conceptual framework is a combined modification of the conceptual frameworks developed by prior studies (Yu, D., Yalcin, M. G., Ozpolat, K., & Hales D. N., 2015). Based on this the study developed conceptual models to indicate the interconnection between dependent and independent variables.





INDEPENDENT VARIABLES

DEPENDENT VARIABLES

Figure 1 Conceptual framework (Adapted from Yu, D., Yalcin, M.G., Ozpolat, K., & Hales D. N., (2015),

Good research frameworks help people make logical sense of the relationships of the variables and factors that are relevant or important within the scope of a research arena. Over the past decades, a number of scholars (e.g., Bowersox, 1996; Chen and Paulraj, 2004; Lambert et al., 1998; Mentzer et al., 2001; etc.) have proposed frameworks for HSCM, each focusing on some aspects of supply chains. In the following, we briefly discuss several existing HSCM frameworks and explain our criteria of selecting framework for groundwork as our framework development. For instance, Lambert et al. (1998) proposed a three-part framework for HSCM which integrates business processes, potential structures of supply chain and key components for supply chain management with limited flow characteristics.

## **CHAPTER THREE**

### **3. RESEARCH METHODOLOGY**

In this chapter, the research design, methodology, sample and sampling technique, target population, sample size, unit of analysis, participants, research instruments, source of data, data collection methods, development of the instrument, data analysis tools, validity and reliability were discussed.

#### **3.1. Description of the Study Area**

World Vision began its ministry in Ethiopia in the early 1970s and opened a national office in Addis Ababa in 1975. The organization launched emergency response programs during the 1984 famine, followed by a period of rehabilitation (1986-87) and a self-review that came up with the concept of Area Development Programs (ADPs) as a model. World Vision's work in Ethiopia contributes to the well-being of vulnerable children in partnership with the church, civil society and the government. Initiatives include education, food security, health, HIV and AIDS, water, sanitation, and hygiene, as well as sponsorship management. Currently, WVE has been providing around 4,110 metric tons of emergency food supplies for 242,481 beneficiaries in SNNP and Oromia regional states, monthly bases.

#### **3.2. Research Approach**

The study was undertaken using quantitative research approaches. The study established that quantitative research deals with quantifying and analyzing variables in order to get results. It involves the utilization and analysis of numerical data using specific statistical techniques to answer questions like who, how much, what, where, when, how many, and how. It also describes the methods of explaining an issue or phenomenon through gathering data in numerical form. The study further reveals quantitative methods categorized into; survey research, correlational research, experimental research and causal-comparative research. This was due to the fact that study focuses on the data to be collected through questionnaires to give condensed pictures of the data by using SPSS. Accordingly, the collected data was presented in to two parts, in the first part the study described the relationship between the dependent and independent variables using frequency. And in the second part the study triangulates the interdependence between the

dependent and independent variables using explanatory research approaches with the help of correlation analysis.

### **3.3. Research Design**

The study adopted both descriptive and explanatory research design. Accordingly, in descriptive method the study focused on the determination of the frequency with which an event occurs and how variables are related in a particular context. And in explanatory approach, the study concern was determining the impact and cause and effect relationships among variables. Hence, this research was carried out with descriptive and explanatory research design in order to give an adequate description of the variables and reveal the extent to which the identified factors affect humanitarian supply chain performance of World vision Ethiopia.

### **3.4. Data Sources and instruments of data collection**

In order to assess the factors that affect the humanitarian supply chain performance in WVE, both primary and secondary sources were used. The sources for the primary data were employees of World vision international Ethiopia that are working in the supply chain program of the organization. To collect the primary data, structured questionnaires as instrument of data collection were used. The instrument was organized into two major parts: the standard questions related to factor affecting supply chain performance of the organization developed from related researches, articles and journals. In addition, the researcher also developed questions based on the context and problem area of the organization. Secondary data were collected from different sources, such as, articles, journals, document of the organization and books used as sources of secondary data sources.

The Likert-type scale method was used from the range of responses: strongly disagree, disagree, Neutral, Agree, and strongly agree, with a numeric value of 1-5, respectively. The usage of this particular scaling method ensured that the research study illustrated the ability to assess the responses and measure the responses quantifiably. So that a pattern or trend may be produced in order to answer the research questions. As Neuman (2003) explained, it is a process of asking many people the same questions and examining their answers research questions.

### **3.5. Sampling Design**

#### **3.5.1. Target Population**



The target population of the study included employees who work at the different departments of world vision international Ethiopia along with the line of humanitarian supply chains. Population of the study is a group of individuals taken from the general population who share a common characteristic. However, the study only considered some of the target population based on relevance of their department of engagement. According to Hair et al. (2010), target population is said to be a specified group of people or object for which questions can be asked or observed made to develop required data structures and information. Therefore, in this study, the target populations were employees of WVE, particularly those staffs working in the department of humanitarian supply chain line. This is because, the study selected those area respondents for they were believed to have adequate knowledge regarding the supply chain processes of the organization as it is related their area of work. The total populations of individual which were targeted to be sampled were 100 in numbers which was limited to the staff under the selected function.

### **3.5.2. Sampling Technique of the Study**

The study employed both purposive and stratified sampling techniques. The rationale behind employing these techniques was that the study preferred to include respondents from various departments such as Warehouse, Procurement, Finance, Logistics and Food Aid Program.

### **3.5.3 Sample Size**

Sample size is referred to the appropriate number of respondents selected for this study. The population of this study is employees of WVE currently working in the lines of humanitarian supply chain department. Therefore, the sample was randomly selected out of 100 total populations based on sampling technique of Belcourt and Saks (2000). The formula is large enough to allow for precision and confidence in general ability of the research. Accordingly, a simple formula to calculate sample size:

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

Hence, to calculate the sample size at 95% confidence level and 5% margin error;

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

$$n = \frac{100}{1 + 100(0.05)^2}$$

$$n = \frac{100}{1.25} = 80 \text{ Where;}$$

n = sample size required (corrected sample size)

e = level of precision (tolerable error)

N= the study population.

Table 3. 1 Total number of target population (Employees currently working in Humanitarian Supply Chain of WVE)

Organization	Department	Target Population/Number of staffs in the department	Sample size Drawn (80%)
WVE	Procurement	30	24
	Warehouse	24	19
	Logistics	20	16
	Finance	16	13
	Food Aid Program	10	8
	<b>Total</b>	<b>100</b>	<b>80</b>

As shown in table 3.1 above, the sample size represents 80% of the total target population having the sample size of 80 respondents.

### 3.6. Methods of Data Analysis

The gathered through questionnaire had to be first edited for their completeness, categorized, registered. Following this, the data was analyzed using descriptive and inferential statistical analysis techniques. With regards to the descriptive analysis, the study analyzed using mean and standard deviation. On the other hand, inferential statistics techniques, specifically correlation and regression analyses were applied to verify the direction of relationships between the

dependent variable and the independent variables. Statistical Package for Social Science (SPSS) software was used in the entire analysis part of the study.

### **3.7. Model Specification**

#### **3.7.1. Multiple regression models**

The effect of independent variables over dependent variable in the study was explained using the following multiple regression model or equation. It was used to predict the value of certain variable based on the other variable. This study used cross sectional data. The intended impact on supply chain performance by factors of planning, communication, coordination, transportation and infrastructural factors was specified using the following model:

$$Y = \alpha + \beta_1x_1 + \beta_2x_2 + \dots + \beta_kx_k + e$$

Where; x is independent variables (Factors), Y is dependent variable (Supply chain performance),  $\alpha$  is constant value and  $\beta$  is coefficient of independent variable to be estimated.

$$Y (\text{SCP}) = \alpha + \beta_1\text{pla} + \beta_2\text{comm} + \beta_3\text{coord} + \beta_4\text{trans} + \beta_5\text{infra} + e$$

Where: -

SCP=Supply chain performance

Pla = planning

Comm= communication

Coo=co-ordination

Trans = transportation,

Infra= Infrastructure,

e = model error term

### **3.8. Validity and Reliability**

#### **3.8.1. Validity**

This study addressed the content validity through the review of literature and adapting instruments used in previous research. Prior to the actual study, a pilot survey was conducted to determine the validity of the data collection instrument which enables to bring out the weaknesses if any of the questionnaire and the survey techniques (Kothari, 2004). Therefore, before administering the questionnaire, 12, i. e 15% copies of questionnaire were distributed selected WVE staffs as pilot scale for its validity and reliability check.

In order to ensure the validity of the views of the respondents using the obtained response to the questionnaire, consult relevant documents, databases and intranet were visited. In addition,

information from secondary data was also used along with responses of survey questioner which were double-checked and triangulated to ensure validity of data.

There are many different types of validity and different types of reliability. Hence, there is several ways in which they can be addressed (Cohen et. al., 2005).

Validity is the degree to which a measure accurately represents what it is supposed to. It is concerned with how well the concept is defined by the measure(s). Therefore, this study tried to addresses validity through the review of literature and adapting instruments used in previous research and the questionnaire was inspected by experienced experts.

The purpose of validity testing is to know how far the instruments measured correctly and accurately. Data analysis will never provide good results unless the data are of good quality. A measure is valid if it actually measures the concept we are attempting to measure. It is reliable if it consistently produces the same result. Aadne Aasland (2008). One of the tools that measure validity is correlation.

**Correlation** is a measure of how well two variables predict each other. Correlation can either take the form of the Pearson Product-Moment Correlation, which assumes interval data, or Spearman Rank-Order Correlation, which assumes only ordinal data. (Lars E., 1990). The Pearson's correlation coefficient ranges from -1to +1. The former indicates a perfect negative relationship while the later indicates perfect positive relationship.

In this work, Pearson's Product Moment Correlation Coefficient was utilized to test validity with the following decision making criteria:

- ♣ The item of a questionnaire is valid if r-statistic is higher than critical value at degree of freedom 95% ( $\alpha =0.05$ ) and otherwise rejected. (i.e. if calculated value>critical value (from Pearson's table) at 95% degree of freedom or  $\alpha$  of0.05), then accept it as "VALID" and if not, then it is invalid.
- ♣ Or if the Sig. (2-tailed) value < 0.05, then the item is valid and if Sig. > 0.05alpha, the item is invalid. (Note that the Sig. (2-tailed) value also known as the p-value, is in most valid circumstances take the "0.000" value)

### 3.7.2. Reliability of the Instrument

In order to assess the internal consistency, reliability between different items of the data, Cronbach's alpha which runs between 0 and 1. If a multiple item construct measure is administered to respondents, the extent to which respondents rate those items in a similar manner is the reflection of internal consistency. Hence, a multiple-item measurement scale internal consistency method is used to the study. Cronbach's alpha coefficient greater than 0.9 implies excellent, greater than 0.8 is good, greater than 0.7 is acceptable, greater than 0.6 is questionable, greater than 0.5 is poor, and less than 0.5 is unacceptable" (George and Mallery, 2003)

The reliability and the value of Cronbach's alpha reliability test showed that there was good internal consistency with a coefficient of higher than the agreed limit of 0.8. The internal consistency or reliability of the instruments that were administered to the participants have the displayed the following result.

Table 3. 2 Reliability Statistics (Cronbach's Alpha)

No	VARIABLES	No. of Items	Cronbach's Alpha	Internal Consistency
1	HSC PLANNING	5	0.901	Excellent
2	HSC COMMUNICATION	7	0.903	Excellent
3	HSC COORDINATION	6	0.935	Excellent
4	TRANSPOTERS' AVAILABILITY	8	0.896	Good
5	ISSUE RELATED TO INFRASTRUCTURE	3	0.915	Excellent
6	HSC PERFORMANCE	3	.886	Good
<b>TOTAL</b>		<b>38</b>	<b>0.9216</b>	<b>Excellent</b>

**Source: Own Survey, 2020**

Therefore, as shown in table 3.2 above, the reliability of the whole items is 0.921 which means the whole items were reliable and consistent.

### 3.9. Ethical Consideration

The source of data for the study was questionnaire and the respondents were assured that the information provided by them is confidential and used exclusively for academic purpose. In

addition, respondents were informed not to include any identity detail and personal reference in the questionnaire. This minimized the biasedness of the response collected from the respondents. In addition, the different research studies, articles and text books used as a reference in the study are exhaustively cited

## **CHAPTER FOUR**

### **RESULTS AND DISCUSSION**

#### **4.1 Introduction**

This section of the paper presents the analysis of the study findings on the factors affecting the supply chain performance of non-government organization: a case of World Vision Ethiopia. The findings were analyzed and presented in the form of frequency tables, mean and standard deviation, correlation and regression equation.

The analysis and interpretation of data was guided by the research objectives from which a discussion of findings has been made. A total of 80 questionnaires were distributed to the sampled respondents, out of which 76 (95%), the level of response regarded to be adequate at any rate, were properly filled and returned. A response rate of 95% is above the required threshold, as stated by Cooper and Schindler (2011), a study response of 65% and above is significant in facilitating the analysis of a study.

Department wise, 2 of the questionnaires, 1 each questionnaire distributed to the procurement, warehouse and logistics department respectively were not returned. The study further sought to determine the general characteristics of the respondents who participated in the study. The findings are presented in this section. The demographic information was sought in order to assist the researcher in determining whether the respondents of the study were a representative sample of the target population for generalization purposes.

#### **4.2 The Demographic Profile of Respondents**

The researcher is interested to know the demographic profiles of the respondents that were included in the study so as to know how representative they were.

Table 4. 1 Demographic Profile of the Respondents

Respondents' Profile		Frequency	Percent	Cumulative Percent
Gender	Male	58	76.3	76.3
	Female	18	23.7	100
	<b>Total</b>	<b>76</b>	<b>100</b>	
Age in Years	20-30	10	13.2	13.2
	31-40	54	71.1	84.3
	Above 40	12	15.7	100.0
	<b>Total</b>	<b>76</b>	<b>100</b>	
Academic Qualification	College Diploma	7	9.2	9.2
	First Degree	47	61.9	71.1
	Second Degree	22	28.9	100.0
	<b>Total</b>	<b>76</b>	<b>100</b>	
Years served in the Organization	Below 2 Years	2	2.6	2.6
	2-5 Years	13	17.1	19.7
	6- 10 Years	38	50.0	69.7
	Over 10 Years	23	30.3	100.0
	<b>Total</b>	<b>76</b>	<b>100.0</b>	
Department/Work unit	Procurement	22	29.0	29.0
	Warehouse	18	23.7	52.7
	Logistics	15	19.7	72.4
	Finance	13	17.1	89.5
	Food Aid Program	8	10.5	100.0
	<b>Total</b>	<b>76</b>	<b>100</b>	

Experience in Humanitarian Sector/Relief Chain	Below 2 Years	2	2.6	2.6
	2-5 Years	13	17.1	19.7
	6- 10 Years	33	43.4	63.1
	Over 10 Years	28	36.9	100.0
	<b>Total</b>	<b>76</b>	<b>100.0</b>	

**Source:** Own Survey, 2020

Table 4.1 above reveals the gender composition of respondents where more than 76.3% constituted by male respondents. This figure is in line with the facts that the majority of the employees in WVE are male.

Due to the fact that age and educational level are supposed to be the predictors of the ability to understand well the issues that were the subject of the study, the respondents were thus requested to fill up their age and educational qualifications. To this end, as indicated in the table 4.1 above, majority of the respondents' age (84.2%) lies within the range of 20 to 40 years. This indicates that the highest percentage of the respondents' age (13.2%) and (71.1%) is within the age of young and early adult respectively. The same source indicates that the other age category of the respondents is above 40 years, which accounts for 15.8%.

In relation to the educational level of the respondents, the table above indicates that there were a total of 47(61.9%) respondents whose education qualification was university degree. There were 22(28.9%) respondents who got their master's degree while the rest 7 (9.1%) that were college diploma holders. The researcher was, therefore, satisfied that the respondents were knowledgeable enough to provide relevant and reliable information that would be appropriate to answer the questions raised under the study.

In terms of years served in the organization, 23 (30.3%) of the respondents have worked in the organization for more than 10 years. Whereas, 38 (50%) of the respondents served in WVE for 6-10 years, 15 (19.7%) of the participants have worked in the organization for less than 5 years. More years of experience provides us with a respondent pool that has been familiar with how humanitarian supply chain line functions. This information suggests that most of the respondents were well experienced and can provide vital information on any of the operations of the organization.



With regard to the department of their engagement, 55 (72.3%) of the respondents were from the department supply chain (procurement, warehouse and logistics department), 8 (10.6%) of the respondents were from Food Aid Program department and the rest 13 (17.1%) were from Finance department. From this information, one could easily understand that majority of the respondents had a direct functional relationship with supply chain line and were able to provide relevant information.

According same table, in relation to experience in humanitarian sector/ relief chain, 28 (36.8%) of the respondents have engaged in humanitarian sector/ relief chain for over ten years. Whereas, 33 (43.5%) of the respondents have had experience of 6 to 10 years in the area of humanitarian sector/ relief chain, the rest 15 (19.7%) of the employees administered for the questionnaire have been working in the humanitarian sector for less than 5 years. This implies that the respondents are undoubtedly familiar with humanitarian supply chain practices and humanitarian/relief activities.

#### **4.3 Factors Affecting Supply Chain Performance of World Vision Ethiopia**

In this section, the respondent's perspectives on humanitarian supply chain performance in the eyes of those factors claimed to have impacts on HSC performance. The respondents were provided with questionnaires on some variables that would help them look at the supply chain management practices affecting supply chain performance of the organization. Furthermore, the respondents were directed to rate their opinions on the Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5) on how they perceived the application of the variables in the management of supply chain in WV Ethiopia.

In this study, based on the respondent's response, a statistical technique; one sample t-test was used to test the significance level of their perception. In this test, the level of agreement is said to have a significant difference, if p value is less than 0.05 (the conventional statistical significant level of error) and t-value greater than 2.

According to Angelo Niel A. Victorino (2018), the calculated composite mean value that ranges from 1 to 1.80 implies respondents' perception of strong Disagreement, whereas the ranges from 1.81 to 2.6 represents perception of Disagreement, range from 2.61 to 3.4, perception of Neutrality, scale from 3.41 to 4.2 and from 4.21 to 5.00 represent respondents' perceptions of agreement and strong agreement respectively.

Setting the average level of agreement to each question as a moderate or 3 (hypothesized test value), the interpretation of the above table is further explained on the below statements to have the general idea of the respondents

The variables were HSC Planning, Communication, coordination, transportation related factors and infrastructure factors.

### 4.3.1 Humanitarian Supply Chain Planning

Planning is vital to an effective humanitarian supply chain practices. The plan must be based, first of all, on a good working knowledge of the geographical, social, political and physical characteristics of the area where the operations are to take place. Such a plan must not only be well thought out in advance, so that it can run smoothly—it must, above all, be clearly understood and accepted by all stakeholders in any future relief operation.

Planning is the strategic portion of SCM and companies need a strategy for managing all the resources that go toward meeting customer demand for their product or service. A large part of SCM planning is developing a set of metrics to monitor the supply chain so that it is efficient, costs less and delivers high quality and value to customers or end users. Sourcing involves choosing suppliers to deliver goods and services needed to create a product. Therefore, supply chain managers develop a set of pricing, delivery and payment processes with suppliers and create metrics for monitoring and improving the relationships. The SCM managers can put together processes for managing their goods and services inventory, including receiving and verifying shipments, transferring them to the manufacturing facilities and authorizing supplier payments

The plan must provide clear picture of the task to be carried out, the integration of all the activities, the correct sequences of the activities. Besides, responsibility to perform the task should be assigned, resource must be allocated, as to when, where and to acquire the resource must be known, the role of coordination must be defined in a logical system and how alternative actions will be implemented if the system is somehow disrupted should be put on table.

Table 4. 2 HSCP Effect of Planning Variables

		Level of Agreement	Test Value = 3
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S. No	Planning Constructs	SD	D	Neu tral	A	SA	N	Mean	Std. Deviati on	T	df	Sig. (2- tailed)
1	The supply chain activities are arranged on time frame to be performed	0	0	23	46	7	76	3.789	0.596	11.55	75	.000
2	The distribution conducted on schedule in route plan	0	0	12	59	5	76	3.908	0.467	16.95	75	.000
3	Re-supply forecast request is conducted based on consumption trend	0	0	14	58	4	76	4.000	0.566	16.05	75	.000
4	The organization uses planning as performance monitoring tool	0	0	12	52	12	76	3.987	0.503	15.41	75	.000
5	Follow up of activities conducted as measured by plan	0	0	10	57	9	76	3.911	0.276	17.10	75	.000

**Source:** Own Survey, 2020

Table 4.2 shows that with regard to the first statement of the arrangement of supply chain activities performed in time frame, its effect on supply chain performance was reacted with the average level of agreement is  $M=3.789$ . This level of agreement, (for  $t=11.550 > 2$ ,  $P=0.000 < 0.05$ ) is significantly above the proposed level of agreement that arrangement of supply chain activities on time frame to be performed in the organization have effect on its Supply chain performance.

From same table, it can be understood that the respondents believe the distribution of the required materials to the needy ones as scheduled with mean level of agreement ( $M=3.908$ , with its respective  $t$ -value=  $16.946 > 2$  and  $p$ -value= $0.000 < 0.05$ ). This implies that distribution of commodities as per plan has impact on the humanitarian supply chain performance of the organization as the mean score of agreement is significantly above the proposed value of midpoint, which is 3. In the organization, according third statement, conducting re-supply forecast based on consumption trend was responded at with mean level of agreement ( $M=3.868$ ,  $t$ - value = $16.051 > 2$  and  $p$ - value =  $0.000 < 0.05$ ). Thus, conducting re-supply forecast to meet unforeseen demand inherent in relief operation is an important factor for the success of humanitarian supply chain performance. The organization is also believed to apply planning as performance monitoring tool with respondents agreeing with ( $M= 4.00$  and associated  $t$ -value =  $15.411 > 2$  and  $p$ -value=  $0.000 < 0.05$ ). The level of agreement on this regard is significantly greater than the proposed level of agreement. Follow up of activities conducted as measured by plan is the final dimension of HSC Planning. This construct is supported by mean score level of agreement ( $M=3.987$ ,  $t$ - value = $17.099$  which is greater than 2 and  $p$ -value =  $0.000 < 0.05$ ).

### 4.3.2 Communication

The Disaster Management Training Program (DMTP, 1993), identified transportation and communication infrastructure as one of the barriers to effective delivery of aid. Communication was also mentioned as one of the challenges facing humanitarian organizations. Long & Wood (1995) explained that organizational language and terminology may hamper the aid process.

Table 4. 3 HSCP Effect of Communication Variables

Communication Constructs	Level of Agreement					Test Value = 3				
	SD	D	Neutral	A	SA	N	Mean	Std. Dev	df	Sig. (2-tailed)
Communication between the supply chain staffs (such as head office, primary distribution point and operational Woreda)	0	0	17	46	13	76	3.947	0.630	75	0.000
Timely and accurate information exchange between the organization and key 3rd party logistics /transporters and other partners	0	0	15	54	7	76	3.895	0.531	75	0.000
Communication between supply chain of the programs with other departments (such as finance and Food Aid Program )	0	1	18	54	3	76	3.776	0.532	75	0.000
Frequent information communication interruption in WVE that affects the supply chain function	0	0	16	50	10	76	3.921	0.583	75	0.000
Exchange of information takes place frequently, informally and/or in a timely manner.	0	0	19	53	4	76	3.803	0.517	75	0.000
The ICT implementation improves the ability of the supply chain to rapidly adjust its capacity in response to customer demand	0	0	19	48	9	76	3.868	0.596	75	0.000
Adoption of ICT contributes to the cost minimization of the total supply chain expense	0	0	20	49	7	76	3.829	0.575	75	0.000

Source: Survey, 2020

Table 4.3 indicates how communication affects supply chain performance of the organization. The results show a strong tendency towards agreement on the establishment effective communication between the supply chain staffs such as head office, primary distribution point and operational staffs at Woreda level for the good performance of HSC of the organization. Effectively set communication at each supply chain hierarchy is essential tool to improve supply chain performance of the organization having a mean of 3.947 and standard deviation of .630. The associated t-value and p-value with this level of agreement are  $t= 13.10 >2$  and  $p\text{-value} =0.000 < 0.05$  respectively. These statistical results indicate that the respondent employees' attitude towards this statement significantly differ from the hypothesized mean value. Next comes is the assessment of the effect of timely and accurate information exchange/communication between the organization and key 3rd party logistics /transporters and other partners on the performance of supply chain of the organization. The reveals a considerable level of agreement against this dimension of the HSC communication variable displaying a mean of 3.895 and standard deviation of 0.531. This level of agreement is significantly above the proposed mean. Thirdly, the respondents showed considerably strong tendency of agreement towards importance of good communication between supply chain of the programs with other departments such as finance and Food Aid Program with mean of M of 3.776, Standard deviation of 0.532, t-value of 12.73 which is by far greater than 2 and p-value of  $0.000 < 0.05$ . This statistical result indicates that good communication between supply chain and other work units unquestionably important. The result shown in same table reveals that frequent information communication interruption greatly affects the supply chain function of the organization as it is supported with  $M=3.921$  level of agreement and respective  $SD= 0.583$ ,  $t\text{-value} = 13.76 >2$  and  $p\text{-value} =0.000 < 0.05$ . On the fourth dimension of communication variable to affect HSC performance, the essence of frequent, formal, informal and timely exchange of information was approved with strong tendency towards its essentiality having a mean of  $M = 3.803$ ,  $SD= 0.517$ ,  $t\text{-value} = 13.53 > 2$  and  $p\text{-value} = 0.000 < 0.05$ . The respondents' attitude towards the adoption of ICT system to enhance the responsiveness of the SC to the unpredictable customer demand and SC cost management efficiency was rated with  $M= 3.868$ ,  $SD= 0.596$ ,  $t\text{-value}= 12.69 >2$ ,  $p\text{-value} =0.000 < 0.05$  and  $M=3.829$ ,  $SD=0.575$ ,  $t\text{-value} = 12.57 > 2$  and  $p\text{-value} = 0.00 < 0.05$  respectively. These statistical results indicate that the adoption of ICT system enhances the operational excellence of HSC performance of WVE and is regarded as one of the main factors that affect the supply chain performance of the organization.

### 4.3.3 Coordination

Stephenson (2005) identified collaboration as a challenge for humanitarian organizations. According to him, relief actors operate in an environment that does not necessarily encourage coordination. Coordination and management of disaster supply chains is therefore increasingly needed and must be put in place in the humanitarian supply chains. Likewise, Long (1997) notes that “most people from development agencies have backgrounds in public policy or third world development and professional logisticians are rare”. The unpredictable nature of disasters makes it difficult to retain well trained employees and those who have been trained are often volunteers who can only work for short periods before they must return to their “real world” jobs. Organizations may experience as high as 80 percent annual turnover in field logistics personnel (Thomas, 2003) further compounding personnel issues. This results in a constant influx of untrained personnel, inexperienced in the particulars of logistics within the organization and relief as a whole.

Table 4. 4 HSCP Effect of Coordination

Coordination Constructs	Level of Agreement					Test Value = 3					
	SD	D	Neu tral	A	SA	N	Mean	Std. Dev	t	df	Sig. (2- tailed)
Coordination between supply chain of the programs with other departments (such as finance and Food Aid Program)	0	0	20	40	16	76	3.95	.691	11.96	75	.000
The organization inform the 3rd party logistics/transporters and partners/beneficiaries in advance for any changing needs	0	0	24	47	5	76	3.75	.569	11.50	75	.000
The organization integrates the supply chain network (e.g. decide to keep warehouse and fleet management)	0	0	20	48	8	76	3.84	.590	12.44	75	.000
The organization has transparency of supply chain process (the way activities are conducted visible for other	0	0	26	44	6	76	3.74	.597	10.76	75	.000
WVE maintains trustworthy relationship with stakeholders like government, militaries, other NGOs	0	0	22	45	9	76	3.83	.619	11.67	75	.000

There is good coordination and understanding between WVE and its donors for its successful operations	0	0	17	53	6	76	3.86	.534	13.96	75	.000
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**Source:** Own Survey, 2020

Table 4. 4 above shows the opinion of employee respondents on coordination as a factor that affects humanitarian supply chain performance. To this end, the opinion of the respondents against coordination between supply chain department and other work units was rated with the mean level of agreement  $M=3.95$ ,  $SD= 0.691$ ,  $t\text{-value} = 11.96 >2$  and  $p\text{-value}= 0.000 < 0.05$ . This implies that the mean level of agreement towards this statement is significantly different from the proposed mean. The respondents were also requested to give their ratings if proactively informing 3<sup>rd</sup> party logistics/transporters and partners/beneficiaries would affect the humanitarian supply chain performance of their organization. Accordingly, they displayed a strong tendency towards this variable with a mean score of ( $M =3.75$ ,  $SD = 0.569$ ,  $t\text{-value} = 11.45 >2$  and  $p\text{-value} =0.000 < 0.05$ ). Based on this result, the difference between the calculated and the hypothesized mean is statistically significant; proactively informing 3<sup>rd</sup> party logistics/transporters and partners/beneficiaries would affect the humanitarian supply chain performance of their organization. The respondents were also required to express their opinion if integrating supply chain network (keeping them informed to enhance informed decision making process) as a coordination dimension might have effect on the supply chain performance of their organization. Strong tendency of agreement towards this proposition was witnessed with a mean score of ( $M=3.84$ ,  $SD = 0.590$ ,  $t\text{-value} = 12.44 >2$  and  $p\text{-value} =.000 < 0.05$ ). This scale of perception is remarkably greater than the proposed mean value and the difference is supported with the associated statistical results. The participants' stance on the fourth statement, which is the formulation of transparent supply chain process was admitted with strong agreement level of ( $M=3.74$ ,  $SD= 0.597$ ,  $t\text{-value}= 10.76 >2$  and  $p\text{-value}= 0.000 <0.05$ ). Respondents' perception on maintenance of trustworthy relationship with stakeholders such as government (local or national, militaries and other NGOs) as a coordination variable affecting supply chain performance was evaluated, and found to be supported with a strong tendency of agreement level of (Mean =3.83,  $SD=0.619$ ,  $t\text{-value} = 11.67 >2$  and  $p\text{-value} = 0.000, < 0.05$ ). Likewise, the opinion of the respondents toward the establishment of good coordination and understanding between the organization and its sponsors was assessed. The result is that it is one of the major factors that

are assumed to affect the humanitarian supply chain performance in such a way that the level of agreement is (mean= 3.86, SD=0.534, t-value = 13.96 >2 and p-value= 0.000 < 0.05).

#### 4.3.4 Transportation Factors

The Disaster Management Training Programs (DMTP, 1993), identified transportation and communication infrastructure as one of the barriers to effective delivery of aid. Disaster may degrade the infrastructure of the area to the point where delivery of aid is severely hampered. In addition, disasters occur in areas where transportation infrastructure is in poor condition and cannot handle the huge number of refugees, military vehicles and relief shipments that come in time of disaster. The solution provided for this challenge was that the obstacle would need to be dealt with on a case by case basis due the unpredictable effects of disasters and the vulnerability of the infrastructure.

Table 4. 5 HSCP Effect of Transportation Factors

Transportation Factors Constructs	Level of Agreement					Test Value = 3					
	SD	D	Neu tral	A	S A	N	Mean	Std. Devi ation	t	df	Sig. (2- tailed )
Sufficient transporters available at Woreda level to transport commodities from operational Woreda to end users distribution points	0	0	13	53	10	76	3.96	.552	15.16	75	.000
3rd party logistics/transporters delivered the commodity from primary to secondary warehouses (Woreda warehouse) without loses	0	0	18	50	8	76	3.87	.574	13.20	75	.000
The organization conducts market surveys to find potential 3rd party logistics for the commodity transportation purpose	0	0	17	54	5	76	3.84	.518	14.18	75	.000
There is effective mechanism adopted that confirms safe arrival of all the shipped goods both in terms of quality and quantity	0	0	16	56	4	76	3.84	.491	14.94	75	.000
The transport unit sends the goods with complete and correct transportation and dispatching documents.	0	0	26	42	8	76	3.76	.630	10.57	75	.000
The transport unit controls the transporters for the delivery of the goods to project offices without delay.	0	0	19	50	7	76	3.84	.567	12.95	75	.000
Transport service providers are capable enough to respond for the organization urgent transport need in short notice	0	0	17	57	2	76	3.80	.462	15.13	75	.000



Computerized Tracking services is used in operation	0	0	29	43	4	76	3.67	.575	10.18	75	.000
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Source: Own Survey, 2020

Table 4.5 above exhibits mean score values of the predictor variables or factors transportation. It is observed that availability of sufficient transporters to move commodities from operational Woreda to end users has a mean score value of 3.96, SD = 0.552, t-value = 15.160 > 2 and p-value = 0.000 > 0.05. The mean score value of this transportation factor lies within the high level range of agreement and is significantly different from the proposed mean value. The other transportation factor variable that was subjected to assessment was if the delivery made by 3<sup>rd</sup> party logistics/transporters from primary warehouse to secondary warehouse is effected without loss. The mean value of agreement obtained is (M=3.87, SD = 0.574, t-value = 13.196 >2 and p-value = 0.000 < 0.05). This score lies within the range of an agreement level that quality of the delivery made by 3<sup>rd</sup> party transporters impacts the performance of supply chain. The other transportation factor over which the attitude of the respondents evaluated was if undertaking market survey to recruit potential 3<sup>rd</sup> party logistics for commodity transportation has impact on supply chain performance. The mean score of this level of agreement towards this proposition is reflected by (Mean value = 3.84, SD = 0.518, t-value = 14.179 > 2 and p-value = 0.000 < 0.05). The mean score is significantly different from the midpoint hypothesized value. The other transportation factor variable that attracted the attention of the respondents and supported with high level of agreement is the adoption of effective and efficient mechanisms that ensures the arrival of commodities both in terms of quality and quantity. The mean score of agreement on this statement is (M= 3.84, SD = 0.491, t-value =14.942 > 2 and p-value = 0.000< 0.05). The respondents were also required to forward their view on the effect of control mechanisms on the performance and every activities of the transporters to deliver commodities without any delay. Strong agreement was recorded towards this variable that adoption of control mechanism is essential to ensure that the delivery of the commodities the without any dalliance so that the lives of those in need would be saved. The mean score against this statement is (M=3.80, SD = .462, t-value = 15.131> 2 and p-value = 0.000 < 0.05). This statistical result is significantly different and greater than the proposed midpoint mean.

#### 4.3.5 Infrastructure Factors

Another major problem faced by logistics managers in humanitarian organizations is that the donor has significant influence over where and how aid is distributed while the victim is a third

party with little voice in the matter (Long & Donald, 1995). Since disaster relief efforts are characterized by considerable uncertainty and complexity that needs to be properly managed in order to address and implement better responses, some researchers have come up with disaster management techniques aimed at reducing or eliminating the challengers. Disaster management is a key factor that drives successful execution of relief efforts and it begins with strategic process design (Tomasini & Wassenhove, 2009).

Table 4. 6 HSCP Effect of Infrastructure Factors

Infrastructure Factors Constructs	Level of Agreement					Test Value = 3					
	SD	D	Neu tral	A	SA	N	Mea n	Std. Dev	t	df	Sig. (2- taile d)
Infrastructure problems like unavailability of all-weather road negatively affects the transportation of commodities from primary distribution points to secondary warehouses and Woreda to end users distribution centers	0	0	18	35	23	76	4.07	.736	12.26	75	.000
Lack of adequate information communication Technology networking infrastructure affects the efficiency of the organization supply chain service	0	0	28	44	4	76	3.68	.571	10.45	75	.000
Unavailability of warehouses at the project office areas and near beneficiary locations affect the supply chain performance of WVE	0	3	16	52	5	76	3.78	.624	10.85	75	.000

**Source:** Own Survey, 2020

Table 4.6 above shows the impact of the infrastructure problems like unavailability of all-weather road affects the transportation of commodities from primary distribution points to secondary warehouses and Woreda to end users. The criticality of this issue is supported with a strong tendency of agreement level of Mean score (M = 4.07, SD = 0.736, t-value = 12.617 >2,

and p-value = 0.000 < 0.05). This level of clearly shows that unavailability of infrastructure such as lack all-weather road poses a great threat on the performance of the supply chain of the organization. The other issue related to infrastructure is concerned with the assessment of the impact of lack of adequate Information Communication Technology networking infrastructure on the efficiency of the organization supply chain service. On this regard, the respondents reacted with a strong scale of agreement having a mean score of (M =3.68, SD = 0.571, t-value =10.453 >2 and p-value = 0.000 < 0.05). Finally, it was observed that unavailability of warehouses at the project office areas and near beneficiary locations affect the supply chain performance of the organization. The respondents showed strong tendency of agreement towards this infrastructural variable with a mean score of (M=3.78, SD= .624, t-value =10.874 > 2 and p-value = 0.000 < 0.05).

#### 4.3.6 Summary of the Means

In terms of factors affecting supply chain performance in WV Ethiopia, the findings show that Planning practice, Communication, Infrastructure related factors, Transportation Factors and Coordination affect supply chain performance with a significant sample mean of 3.91, 3.86, 3.85, 3.84 and 3.83 level of agreement respectively.

Table 4.7 below puts all the means of the identified independent variable as well as of the dependent variable al together. It has already been pointed out in the previous discussions that all of the dimensions of the independent variables are falling within the agreement level.

One-Sample Test				Test Value = 3					
Statement	N	Mean	Std. Deviation	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
								Lower	Upper
PLANNING	76	3.91	0.28	28.76	75	.000	0.91	0.85	0.97
COMMUNICATION	76	3.86	0.29	26.04	75	.000	0.86	0.79	0.92
COORDINATION	76	3.83	0.30	23.77	75	.000	0.83	0.76	0.90
TRANSPORTATION FACTORS	76	3.84	0.26	28.49	75	.000	0.84	0.78	0.90

INFRASTRUCTURE FACTORS	76	3.85	0.30	24.34	75	.000	0.85	0.78	0.92
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**Table 4. 7 Table for Dependent and independent variable one sample t-test result**

**Source:** Own Survey, 2020

Table 4.7 above indicates the respondents’ opinion on all the independent variables identified to have effect on the humanitarian supply chain performance of WVE. According to the table, all the corresponding level of agreement towards the predictors are statistically significant and significantly different from or above the hypothesized moderate level of agreement.

#### **4.4 Inferential Statistics for factors affecting HSC Performance of WVE**

##### **4.4.1 Correlation Analysis**

In this section, the researcher conducted correlation analysis in the light of each research objectives and research questions. The researcher used Karl Pearson’s coefficient of correlation (or simple correlation) analysis as it is the most widely used method of measuring the degree of relationship between two or more variables. The relationship between humanitarian supply chain specific factors and HSC performance of the organizations was investigated using Pearson’s coefficient of correlation analysis. This provided correlation coefficients which indicated the strength and direction of relationship. The employed p-value also indicated the probability of the significance of this relationship.

Values of Pearson’s correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive sense; whereas a correlation coefficient of -1 indicates that two variables are perfectly related in a negative sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables. A low correlation coefficient; 0.1 - 0.29 suggests that the relationship between two items is weak or non-existent. If r is between 0.3 and 0.49 the relationship is moderate. A high correlation coefficient i.e.  $p > 0.5$  indicates a strong relationship between variables. The direction of the dependent variable’s change depends on the sign of the coefficient. If the coefficient is a positive number, then the dependent variable will move in the same direction as the independent variable; if the coefficient is negative, then the dependent variable will move in the opposite direction of the independent variable. Hence in this study both the direction and the level of relationship between the dimensions of the organization supply chain management practice and

organizational performance are conducted using the Spearman's rho correlation coefficient. The table below presents the result of the correlation analysis made using bivariate correlation.

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

Table 4. 8 Correlation Matrix

		PLANNING	COMMUNICATION	COORDINATION	TRANSPORTATION FACTORS	INFRASTRUCTURE FACTORS	HSC PERFORMANCE
PLANNING	Pearson Correlation	1	.716**	.539**	.817**	.570**	.844**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	76	76	76	76	76	76
COMMUNICATION	Pearson Correlation	.716**	1	.435**	.787**	.698**	.805**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	76	76	76	76	76	76
COORDINATION	Pearson Correlation	.539**	.435**	1	.520**	.453**	.632**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	76	76	76	76	76	76
TRANSPORTATION FACTORS	Pearson Correlation	.817**	.787**	.520**	1	.660**	.857**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	76	76	76	76	76	76
INFRASTRUCTURE FACTORS	Pearson Correlation	.570**	.698**	.453**	.660**	1	.748**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	76	76	76	76	76	76

HSC PERFORMANCE	Pearson Correlation	.844**	.805**	.632**	.857**	.748**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	76	76	76	76	76	76

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

**Source:** Own Survey, 2020

As indicated in the correlation matrix table, the correlation coefficient between HSC Performance and HSC Planning ( $r= 0.844$ ), it can be said that there is strong and positive relationship between Humanitarian Supply Chain Performance and HSC Planning; the significance of this relationship is tested at 95% confidence level that the calculated (2-tailed) P-value is less than alpha ( $p = 0.000 < 0.05$ ). There also observed strong positive relationship of ( $r= 0.805$ ) between communication and supply chain performance. This relationship is statistically significant with a significance level (2-tailed) P-value less than alpha ( $p<0.05$ ) at 95% at confidence level. The correlation coefficient between Coordination and supply chain performance was found to be  $r=.632$  This positive relationship is statistically significant with significance as (2-tailed) P-value is less than alpha ( $p<0.05$ ) at 95% confidence level. Similarly, the linear relationship between Transportation Factors and Humanitarian Supply chain performance is found to be remarkably the strongest positive linear relationship with  $r=.857$  and significance (2-tailed) P-value is less than alpha ( $p<0.05$ ) at 95% confidence level. The calculated correlation coefficient between infrastructure variables and humanitarian supply chain performance has displayed a positive relationship as indicated by  $r= .748$ , which is statistically significant at 95% confidence level with  $p\text{-value} =0.000 < 0.05$ .

#### **4.5 Analysis of the Factors Affecting Humanitarian Supply Chain Performance in WVE**

In order to determine and figure out the extent to which the explanatory variables explain the variation in the explained variable, multiple regression analysis was carried out using the statistical software SPSS 20.

#### **4.5.1 Multiple Linear Regression Analysis**

Multiple linear regression, the extension of simple linear regression analysis and the next step up after correlation, helps us know the numerical association between two or more independent variables and a single continuous dependent variable. Multiple linear regression is employed when one wants to predict the value of one variable based on the already known values of other variables. The variable of interest subjected to prediction is known as dependent variable (or sometimes, the outcome variable) which is Humanitarian supply chain performance in this case. The variable we are using to predict the other variable's value is called the independent variable (or sometimes, the predictor variables) which in this study are HSC Planning, Communication, Coordination, Transportation factors and Infrastructure factors.

The prediction of the dependent variable based on the values of the independent variables is reinforced by the values of multiple correlation coefficients (R), Coefficient of determination (R square) were examined. The coefficient of determination (R square) is the measure of the variation in dependent variable due to the independent variable incorporated in the model. The independent variables have accounted for 87.4% (adjusted R square of 86.5% with estimated standard deviation 0.096) of the variance in the criterion variable (Humanitarian Supply Chain Performance). This statistical result shows that 87.4% of the variation in the humanitarian supply chain performance was explained by HSC Planning, communication, coordination, Transportation Factors and Infrastructure related factors. The remaining 13.6% of the variance is, however, attributed to other variables not captured by the model. Hence, the result depicts that further research is needed to reach the factors that affect the humanitarian supply chain performance of WVE. F-statistic, the regression mean square divided by the residual mean square that explains whether the results of the regression model could have occurred by chance, has a value of 96.749 and significant at 0.000. Large F value and a small significance level indicate that the results probably are not due to random chance. Nevertheless, it is possible to say that the regression model adopted in this study could have not occurred by chance and is considered significant.

#### **4.5.2 Model Summary**

Whereas the independent variables investigated were found to have explained 87.4% of the humanitarian Supply Chain Performance of WVE, 13.6% of variation this dependent variable was affected by other excluded variable variables that were not studied.

Table 4. 9 Model Summary and ANOVA for Multiple Linear Regression

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.935 <sup>a</sup>	.874	.865	.09642	2.011

a. Predictors: (Constant), HSC Planning, HSC Communication, HSC Coordination, Transportation Factors and Infrastructure related Factors

b. Dependent Variable: Humanitarian Supply Chain Performance

**4.5.3 ANOVA Results**

As an effort to test the fitness of the model in estimating the effects of the independent variables on the HSC performance of WVE, two-way ANOVA was carried out. The associated statistics (F) and P-value were, F= 96.749 and p-value=0.000 respectively. These values indicate the significance of the model developed to predict the effect of the independent variable on the humanitarian supply chain performance of the organization.

**ANOVA<sup>a</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	4.497	5	.899	96.749	.000 <sup>b</sup>
Residual	.651	70	.009		
Total	5.148	75			

a. Dependent Variable: Humanitarian Supply Chain Performance

b. Predictors: (Constant), HSC Planning, HSC Communication, HSC Coordination, Transportation Factors and Infrastructure Related Factors

**4.5.4 Coefficients**

The coefficients, (both standardized and unstandardized) shall be used to indicate the contribution of each individual independent variable on the dependent variable. Beyond that, the magnitude and sign of these coefficients are also used to test the developed hypothesis.

**Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients	Standardized	T	Sig.	Collinearity Statistics
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		Coefficients						
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.203	.183		-1.111	.270		
	HSC Planning	.302	.074	.318	4.105	.000	.301	3.321
	HSC Communication	.152	.069	.167	2.186	.032	.311	3.215
	HSC Coordination	.145	.045	.167	3.224	.002	.670	1.492
	Transportations Factors	.239	.090	.233	2.665	.010	.235	4.251
	Infrastructure Factors	.191	.054	.221	3.551	.001	.466	2.144

a. Dependent Variable: Humanitarian Supply Chain Performance.

From the coefficient table above, below multiple regression function was developed

$$1. \text{ HSCP} = -0.203 + 0.302 \text{ PLAN} + 0.239 \text{ TRNS} + 0.191 \text{ INFRAS} + 0.152 \text{ COMM} + 0.145 \text{ COORD} \dots\dots\dots (1) \text{ Where,}$$

**HSCP:** Humanitarian Supply Chain Performance

**PLAN:** Planning

**COORD:** Coordination

**COMM:** Communication

**TRANS:** Transportation Factors

**INFRAS:** Infrastructure Factors

From the above multiple regression equation, the identified independent variables; planning, communication, coordination, transportation and infrastructure factors are the predictors of the humanitarian supply chain performance of the world vision of Ethiopia as defined by the unstandardized Beta coefficient. The variable HSC Planning with a coefficient of ( $\beta = 0.302$ ) shows that letting other variables in the equation remain constant, a one-unit increase in the quality of HSC Planning would lead to 30.2% increase in the humanitarian supply chain performance of WVE. The finding is in line with the views of (Keeney, 2004 and Tekeli Yesil, 2006) that good planning makes it possible to increase organization's efficiency and effectiveness of an aid operation.

Similarly, the variable transportation factor with a coefficient ( $\beta = 0.239$ ) was found to be the second factor affecting the humanitarian supply chain performance of the organization. The result indicates that holding other variables in the equation constant, a one-unit improvement in

transporters' availability, efficiency and management leads to 23.9% in the improvement of the humanitarian supply chain performance of the organization.

Thirdly, infrastructure related factors, the other important independent variable affecting the humanitarian supply chain performance of WVE. With this was the calculated the unstandardized Beta coefficient of ( $\beta= 0.191$ ) that implies keeping other variable constant, a one-unit betterment in the quality of infrastructure would get us 19.1% increase in the performance of the humanitarian supply chain line of the organization. The result is consistent with the views of Rodman (2004) that degraded infrastructure impedes the efficiency of humanitarian supply chain performance. In addition, as to The Disaster Management Training Programme (DMTP, 1993), disasters occur in areas where transportation infrastructure is in poor condition and cannot handle the huge number of refugees, military vehicles and relief shipments that come in time of disaster. The solution provided for this challenge was that the obstacle would need to be dealt with on a case by case basis due the unpredictable effects of disasters and the vulnerability of the infrastructure.

Finally, HSC Communication and Coordination were identified to be the important independent variables affecting the humanitarian supply chain performance displaying similar unstandardized Beta coefficient of ( $\beta= 0.152$ ) which was to mean that holding all the variables in the model constant, a unit improvement in communication practices and coordination efforts leads to 14.5% increment in the humanitarian supply chain performance of the organization. The result is in line with the findings of The Disaster Management Training Program (DMTP, 1993), that communication infrastructure as one of the barriers to effective delivery of aid.

#### **4.6 Diagnostic Test**

How good or bad our estimation technique in this study in terms of fitting the sampled data and testing hypothesis tests regarding if the coefficient estimates are correctly made, a diagnostic test was conducted by employing SPSS software package.

##### **4.6.1 Goodness of fit**

In investing the effect of those factors affecting humanitarian supply chain performance in WVE, the researcher included five explanatory variables, namely humanitarian supply chain planning, communication, coordination, transportation factors ad infrastructure related factors) and dependent variable (humanitarian supply chain performance). The functional relationship

between variables in this study is, therefore, humanitarian supply chain performance is a function of planning, communication, coordination, transportation factors and infrastructure related factors.

In order to know how well the model containing these five explanatory variables actually explain the variations in the dependent variable, it is necessary to test it through goodness of fit statistic.

Table 4. 10 Testing the model through ANOVA (Goodness of fit statistics)

**ANOVA<sup>a</sup>**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	4.497	5	.899	96.749	.000 <sup>b</sup>
Residual	.652	70	.009		
Total	5.148				

**Source:** Own Survey, 2020

- a. Dependent Variable: Humanitarian Supply Chain Performance
- b. Predictors : ( Constant), Planning, Communication, Coordination, Transportation Factors and Infrastructures Factors.

The above table summarizes the information about the variation of the dependent variable explained by the model used for this study, and the residual that indicates the variation of the dependent variable that are not captured by the model. Mean square, shown on the 4<sup>th</sup> column of the table, is the sum of square divided by the degrees of freedom. F-statistic, on the other hand, is the regression mean square divided by the residual mean square.

Therefore, by comparing the significance value of F-statistic from the table with the P-value at 5% significance level, we may reject or fail to reject the null hypothesis of the fitness of the model.

The significance value of F- statistic or regression model in general, from the table shows 0.000. Thus, the statistical significance of the regression model that is used for the study is less than 0.05. (i.e.  $P < 0.000$ ), and therefore, we reject the null hypothesis “there is no relationship

between explained and explanatory variables” indicating that, over all, the model used for the study is significantly good enough in explaining the variation on the dependent variable.

Similarly, the goodness of fit of the model can be measured by the square of the correlation coefficient also called  $R^2$ . According to Brook (2008), the most common goodness of fit statistic is  $R^2$ . He states that  $R^2$  is the square of the correlation between the value of the dependent variable and the corresponding fitted values from the model. This square of the correlation coefficient ( $R^2$ ) is always lies between 0 and 1. If this correlation is high (close to one), the model fits the data well, while if the correlation is low (close to zero), the model is not providing a good fit to the data.

Table 4. 11 Goodness of fit through R square

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
4	.935 <sup>a</sup>	0.874	0.865	0.964

**Source:** Own Survey, 2020

c. Dependent Variable: Humanitarian Supply Chain Performance

d. Predictors :( Constant), Planning, Communication, Coordination, Transportation Factors and Infrastructure Factors

$R^2$  represents the amount of variance in the outcome explained by the model, Model sum of squares (SSM), relative to how much variation there was to explain in the first place, Total Sum of Squares (SST). Therefore, as a percentage, it represents the percentage of the variation in the outcome that can be explained by the model. Both  $R^2$  and adjusted  $R^2$  measure the fitness of the model. They measure the proportion of the variation in dependent variable explained by the model. But since adjusted  $R^2$  is the modification for the limitation of  $R^2$ , the value of the adjusted  $R^2$  is considered to measure the fitness of the model.

Thus, as it is shown on table 4.11, the value of  $R^2$  is 0.874, indicating that the independent variables in the model explain 87.4% of the variations in the dependent variable. Thus, we can conclude that the model of the study is providing a fairly good fit to the data.

#### 4.6.2 Multicollinearity Test

Multicollinearity exists when there is a strong correlation between two or more predictors in a regression model. Perfect collinearity exists when at least one predictor is a perfect linear combination of the others (the simplest example being two predictors that are perfectly correlated – they have a correlation coefficient of 1. If there is perfect collinearity between predictors it becomes impossible to obtain unique estimates of the regression coefficients because there are an infinite number of combinations of coefficients that would work equally well. Put simply, if we have two predictors that are perfectly correlated, but rarely in reality, then the values of coefficients for each variable are interchangeable. Low levels of collinearity pose little threat to the models generated by SPSS.

There are various collinearity diagnostics, one of which is the variance inflation factor (VIF). The VIF indicates whether a predictor has a strong linear relationship with the other predictor(s). Although there are no hard and fast rules about what value of the VIF should cause concern, Myers (1990) suggests that a value of 10 is a good value at which to worry. If the average VIF is greater than 1, then Multicollinearity may be biasing the regression model (Bowerman & O’Connell, 1990). Related to the VIF is the tolerance statistic, which is its reciprocal (1/VIF). As such, values below 0.1 indicate serious problems although Menard (1995) suggests that values below 0.2 are worthy of concern.

Table 4. 12 Multicollinearity Test Table

Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
5 (Constant)	-.203	.183		-1.111	.270		
Transportation Factors	.239	.090	.233	2.665	.010	.235	4.251
Planning	.302	.074	.318	4.105	.000	.301	3.321
infrastructure Factors	.191	.054	.221	3.551	.001	.466	2.144
Coordination	.145	.045	.167	3.224	.002	.670	1.492
Communication	.152	.069	.167	2.186	.032	.311	3.215

*Source:* Own Survey, 2020

The Multicollinearity test table (table:4.12) summarizes the unstandardized and standardized coefficient, t-statistic and statistics for collinearity for all of four explanatory variables. The t-statistic helps us to determine the relative importance of each variable in the model. Among the statistics for collinearity, tolerance is the one which is used to determine how much the independent variables are linearly related to one another.

In this study, however, there is no variable with the value of tolerance less than 0.10 and no variables whose VIF values are greater than 10. This means that there is no evidence for the presence of multi-collinearity in the study.

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of key findings, conclusion drawn from the findings highlighted and recommendation made based on the findings. The conclusion and recommendations drawn towards addressing the specific research objectives of identifying the factors affecting the Humanitarian Supply Chain Performance of World Vision Ethiopia. Throughout the study, Humanitarian Supply Chain Performance of WVE was deeply analyzed

from the perspectives of the variables of HSC Planning, Communication, Coordination, Transportation and Infrastructure factors.

## **5.2 Summary of the findings**

The study was undertaken to find out factors affecting supply chain performance of World Vision Ethiopia-a non-governmental organization that primarily engages in humanitarian relief operations. The study was basically initiated in pursuit of addressing five basic objectives: knowing the effects of HSC Planning supply chain and how it affects the later, studying the effects of communication on HSCP and how communication affects HSCP of the organization, examining the impact of coordination on supply chain performance and the way coordination influences HSCP of WVE, assessing the influence of transporters' availability, efficiency and management on SC performance and investigating the effects of infrastructure factors on the humanitarian supply chain performance of the organization under consideration.

The study adopted both descriptive and explanatory research design. In descriptive method, the study focused on the determination of the frequency with which an event occurs and how variables are related in a particular context. And in explanatory approach, the concern of the study was determining the cause and effect relationships among variables. To this end, this research was carried out with descriptive and explanatory research design in order to give an adequate description of the variables and reveal the extent to which the identified factors affect humanitarian supply chain performance of World vision Ethiopia.

Humanitarian Supply Chain Planning was given the highest rank as a factor affecting the HSC Performance of the organization by getting the highest tendency of agreement level towards its overall dimension. The finding shows 84% of the respondents reacted with strong level of agreement on HSC Planning practices that it poses greatest influence on the organization's supply chain performance with a mean value (mean 3.91). This indicates the type of planning strategy adopted can inflict a very positive or a very adverse impact particularly on the supply chain performance, and on the overall performance of the organization as a general.

The finding is in line with the views of (Keeney, 2004 and Tekeli Yesil, 2006) that good planning makes it possible to increase organization's efficiency and effectiveness of an aid operation.

As the overall objective of planning is to Properly respond to the humanitarian needs in case of disasters is considered to be mitigation and satisfying the initial and vital needs of the survivors,

the activities need to be arranged in time frame and on schedule using the least amount of the resources to reduce the terrible effects of the disaster.

Second comes is transporters' availability, efficiency and management that was put on the second place as a factor affecting the HSC Performance of the organization by getting the second highest tendency of agreement level towards its overall dimension. The finding shows that 85.5% of the respondents reacted with strong level of agreement towards this variable of having greatest influence on the organization's supply chain performance with a mean value (mean 3.86). This indicates the availability and mode of transportation, and its efficiency defines our responses to the emergency humanitarian assistance need to reach its destination as intended. When designing an emergency supply transport strategy, it is not enough to consider only sufficient availability of the transporters but efficient mechanisms are required to be established to confirm the safe arrival of the commodities to the beneficiaries, Alternative means, methods, and routes should be considered as a matter of course. The challenge does not lie in eventually getting the supplies to their destination, regardless of when they may be needed—but in making sure that they arrive safely and on time.

The study indicates the third factor that was found to affect the humanitarian supply chain performance is infrastructure factor as majority (86.8%) of the respondents reacted with 3.85 level of agreement that poor infrastructure affects delivery of goods and supplies at the required time and place.

Finally, the result revealed by the study indicates that communication and coordination were tipped to have effects on the efficient functioning of the humanitarian supply chain performance of the organization. Both were responded with fairly strong level of agreement (3.86 and 3.83) respectively. Communication impediments or misunderstanding could cost lives. Coordinating logistics during relief efforts is often a daunting task that can result in the loss of life and resources if not done quickly and effectively. In fact, there is not a unique recognized model of supply chain management which designed and appropriated by managers with in the humanitarian sector for humanitarian logistics and relief supply chain efforts for populations affected by disasters

Coordination and communication among the organizations taking part in the natural disasters responses because of various goals and objectives including; Management of transportation, Supply chain techniques for humanitarian logistics, Education and training, Resource



management, Partnership with military, Logistics Information System (LIS), Assessment of damage, Act according to the local & regional, Decisive command and control, and Competition for uncertainty.

All too often, local organizations involved in emergency response do not have the resources to respond effectively to a disaster. It is therefore important to determine what resources an organization has (or is lacking), and what is required for relief operations to be carried out effectively. If logistical planning and preparations have taken place before the event, this will make it easier to determine which resources are available—and which are lacking and must be procured elsewhere.

### **5.3 Conclusion**

The effect and the extent of the effect of the factors identified to have impact on the humanitarian supply chain performance in this study was evaluated based on two scenarios; mean score method and Multiple linear regression method.

Based mean score method of interpretation of the data collected from the employee respondents, the study came up with result that planning affects humanitarian supply chain performance at greater level. Adoption of sound and proper planning strategies brings a striking role and has become an important enabler to improve organizations supply chain performance. Hence, planning needs to be designed carefully, as it can inflict a very positive or a very adverse impact on the overall performance of the organization. The study also established that communication practices (effective communication between the supply chain staffs (such as head office, primary distribution point and operational Woredas, timely and accurate information exchange between the organization and key 3rd party logistics /transporters and other partners, frequent information communication interruption, ICT implementation to improve the ability of the supply chain to rapidly adjust its capacity in response to unforeseen customer demand) improves supply chain performance . Thirdly, the infrastructure factors (unavailability of all-weather road to transport commodities from primary distribution points to secondary warehouses and Woreda to beneficiaries, lack of adequate information communication Technology networking infrastructure and unavailability of warehouses at the project office areas and near beneficiary locations) examined in the study were found to have negative impact on the organizations supply chain performance. On contrary, transportation factors assessed from the perspectives of transporters' availability, efficiency and management (availability of sufficient transporters to move aid commodities from operational Woreda to beneficiaries' distribution center, delivery

made by 3rd party logistics/transporters without any discrepancies, undertaking market surveys to find potential 3rd party logistics for the commodity transportation, and establishment of effective mechanism to confirm safe arrival of all the shipped goods both in terms of quality and quantity) were discovered to positively affect and enhance the humanitarian supply chain performance. Finally, the coordination practices examined in the study were also noticed to have positive impact on the organization's supply chain performance.

Based on the multiple linear regression analysis, too, followed by transportation factors, HSC Planning was found out to have the greatest positive effect on the humanitarian supply chain performance of the organization. Similarly, while coordination and communication practices positively and equally influence HSCP, infrastructure factors were identified to have the greatest negative impact on the humanitarian supply chain performance of the organization.

#### **5.4 Recommendation**

Based on the findings of the study, the following recommendations are proposed: supply chain performance have led to increase in costs to the organization due to inefficiency and that more focus needs to improve supply chain performance and the management of the organization remains committed to offer appropriate support for supply chain department. Proper planning is pivotal in enhancing the efficiency of any organization. Therefore, during planning process, a due attention should be paid strategic and operational factors as well as tangible and intangible factors which may enhance the performance of the organization. For a supply chain performance to achieve its maximum level of effectiveness and efficiency, holistic and participatory planning should be designed, effective communication should be used in making employees understand the need for SCM, establishing a coordination system with other players of the scene and enabling the system for sharing of imposed issues and problems, and coping strategies in the context of humanitarian aids logistics is considered. The organization needs to work in collaboration with external players and stakeholders so as to get the infrastructure facilities developed.

#### **5.5 Area of Further Study**

It would also be interesting to expand this study to other non-government organization in the country plus business and government organizations. In addition, there is need to study additional factors in an organization that influence supply chain performance. Generally, there is a need for similar studies to be conducted in other NGOs in the country to facilitate a better understanding and perception about the factors affecting supply chain performance.

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## APPENDIX

### QUESTIONNAIRE

#### JIMMA UNIVERSITY

#### COLLEGE OF BUSINESS AND ECONOMICS

**Dear respondents,**

I'm a graduate student at Jimma University College of business and economics in the Department of Management. Currently, I'm conducting a research entitled '**Factors Affecting Humanitarian Supply Chain Performance in Non –Governmental Organizations: A case of World vision Ethiopia**' as a partial fulfillment of the requirements for the Degree of Master in Business Administration, Jimma University, College of business and economics.

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

Sincerely yours,

BayisaTerefe

**Please Note:**

1. No need of writing your name.
2. Indicate your answer with a check mark (√) on the appropriate block/cell for all questions.
3. If you need further explanation please contact me and discuss the matter freely at  
(Telephone No. 0911031191, E-mail [Bayisa\\_Terefe@wvi.org](mailto:Bayisa_Terefe@wvi.org) OR bayisa69@gmail.com)

**Section I: General Information**

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

1.1 Sex

- 1) Female  2) Male

1.2 Age

- 1) Under 20 Years Old  3) 31-40 Years Old

- 2) 20-30 Years Old  4) Over 40 Years Old

1.1 Educational Qualification:..

- |   |  |
|---|--|
| 1) Below college Diploma <input type="checkbox"/> | 3) First Degree <input type="checkbox"/>             |
| 2) College Diploma <input type="checkbox"/>       | 4) second degree (MSc & MA) <input type="checkbox"/> |
| 5) PhD & above <input type="checkbox"/>           |  |

1.4 Years stayed at the organization:

- 1) Under 2 Years  3) 6-10 Years

- 2) 2-5 Years  4) Over 10 Years

1.5 Your department/work unit:

- 1) Procurement  2) Finance  3) Warehouse   
4) Logistics  5) Food Aid Programming

1.6 How long have you been working in humanitarian sector/relief chain operation?

- 1) Under 2 Years  3) 6-10 Years

- 2) 2-5 Years  4) Over 10 Years

**Section II: Main Questionnaire**

Please indicate your choice by putting the tick mark (√) on the appropriate cell. **Where, 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.**



Please indicate the degree to which you agree with the following statements regarding World vision Ethiopia position pertaining to Supply Chain management practices of development and emergency food aid programs.

<b>A. Planning</b>		Score				
		1	2	3	4	5
1	The supply chain activities are arranged on time frame to be performed.					
2	The distribution conducted on schedule in route plan					
3	Based on the consumption, re-supply had been forecasted to be requested					
4	The organization uses planning as performance monitoring tool.					
5	Follow up of activities conducted as measured by plan					
<b>B. Communication</b>						
6	Good communication and coordination between the supply chain staffs (such as head office, primary distribution point and operational Woredas)					
7	Information exchange between the organization and key 3rd party logistics /transporters and other partners timely and in accurate manner					
8	Good communication between supply chain of the programs with other departments (such as finance and logistics)					
9	There is no frequent information communication interruption in WVE that affects the supply chain function					
10	Exchange of information takes place frequently, informally and/or in a timely manner.					
11	The ICT implementation improves the ability of the supply chain to rapidly adjust its capacity in response to customer demand.					
12	Adoption of ICT contributes to the cost minimization of the total supply chain expense					
<b>C. Coordination</b>						
13	Good coordination between supply chain of the programs with other departments (such as finance and logistics)					
14	The organization inform the 3rd party logistics/transporters and partners/beneficiaries in advance for any changing needs					

15	The organization integrates the supply chain network (e.g. decide to keep warehouse and fleet management)					
16	The organization has transparency of supply chain process (the way activities are conducted visible for other)					
17	WVE maintains trustworthy relationship with stakeholders like government, militaries, other NGOs					
18	There is good coordination and understanding between WVE and its donors for its successful operations					
<b>D. Transporters' availability, efficiency and management</b>						
19	Sufficient transporters available at Woreda level to transport commodities from operational Woreda to end users distribution points					
20	3rd party logistics/transporters delivered the commodity from primary to secondary warehouses (Woreda warehouse) without loses					
21	The organization conducts market surveys and find potential 3rd party logistics for the commodity transportation					
22	There is effective mechanism adopted that confirms safe arrival of all the shipped goods both in terms of quality and quantity.					
23	The transport unit sends the goods with complete and correct transportation and dispatching documents.					
24	The transport unit controls the transporters for the delivery of the goods to project offices without delay					
25	Transport service providers are capable enough to respond for the organization urgent transport need in short notice					
26	Computerized Tracking services is used in operation					
<b>E. Infrastructure Related Issues</b>						
27	Infrastructure problems like unavailability of all-weather road negatively affects the transportation of commodities from primary distribution points to secondary warehouses and Woreda to end users distribution centers					
28	Lack of adequate information communication Technology networking infrastructure affects the efficiency of the organization supply chain service					
29	Unavailability of warehouses at the project office areas and near beneficiary					

	locations affect the supply chain performance of WVE					
<b>F. Humanitarian Supply Chain Performance with intended/targeted beneficiaries</b>						
30	The organization delivered quality of foods to drought affected beneficiaries on time to save lives					
31	The organization achieved in reducing casualties and impact of the disaster/drought on human lives					
32	The organization has accountable towards beneficiaries and donors					
33	The organization has controlled the quality of the commodities at primary distribution points, at operational Woredas and end users distribution points					
34	Beneficiaries are much satisfied with the achievements of the time efficiency of the organization commodity/food distribution					

6. Please indicate the degree to which your organization successfully, performs or not the organization mission regarding supply chain operation system.

35	Regarding, the supply chain planning, communication and coordination the organization performs well.					
36	The organization performs well in reducing challenges of transport availability and infrastructural problem's.					
37	The organization perform well in delivering products, for target beneficiaries					

*Thank You!*

## APPENDIX

## DEMOGRAPHIC PROFILE OF THE RESPONDENTS

Respondents' Profile		Frequency	Percent	Cumulative Percent
Gender	Male	58	76.3	76.3
	Female	18	23.7	100
	<b>Total</b>	<b>76</b>	<b>100</b>	
Age in Years	20-30	10	13.2	13.2
	31-40	54	71.1	84.2
	Above 40	12	15.8	100.0
	<b>Total</b>	<b>76</b>	<b>100</b>	
Academic Qualification	College Diploma	7	9.2	9.2
	First Degree	47	61.9	71.1
	Second Degree	22	28.9	100.0
	<b>Total</b>	<b>76</b>	<b>100</b>	
Years served in the Organization	Below 2 Years	2	2.6	2.6
	2-5 Years	13	17.1	19.7
	6- 10 Years	38	50.0	69.7
	Over 10 Years	23	30.3	100.0
	<b>Total</b>	<b>76</b>	<b>100.0</b>	
Department/Work unit	Procurement	22	29.0	29.0
	Warehouse	18	23.7	52.7
	Logistics	15	19.7	72.4
	Finance	13	17.1	89.5
	Food Aid Program	8	10.5	100.0
	<b>Total</b>	<b>76</b>	<b>100</b>	
Experience in Humanitarian Sector/Relief Chain	Below 2 Years	2	2.6	2.6
	2-5 Years	13	17.1	19.7
	6- 10 Years	33	43.4	63.2
	Over 10 Years	28	36.8	100.0
	<b>Total</b>	<b>76</b>	<b>100.0</b>	

## CORRELATIONS

Correlations							
		PLANNING	COMMUNICAT TION	COORDINATI ON	TRANSPORTATIO N FACTORS	INFRASTRUC TURE FACTORS	HSC PERFORM ANCE
PLANNING	Pearson Correlation	1	.716**	.539**	.817**	.570**	.844**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	76	76	76	76	76	76
COMMUNICAT ION	Pearson Correlation	.716**	1	.435**	.787**	.698**	.805**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	76	76	76	76	76	76
COORDINATIO N	Pearson Correlation	.539**	.435**	1	.520**	.453**	.632**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	76	76	76	76	76	76
TRANSPORTAT ION FACTORS	Pearson Correlation	.817**	.787**	.520**	1	.660**	.857**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	76	76	76	76	76	76
INFRASTRUCT URE FACTORS	Pearson Correlation	.570**	.698**	.453**	.660**	1	.748**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	76	76	76	76	76	76
HSC PERFORMANC E	Pearson Correlation	.844**	.805**	.632**	.857**	.748**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	76	76	76	76	76	76
**. Correlation is significant at the 0.01 level (2-tailed).							

## COEFFICIENTS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.203	.183				
	HSC Planning	.302	.074	.318	4.105	.000	3.321
	HSC Communication	.152	.069	.167	2.186	.032	3.215
	Average score of HSC Coordination	.145	.045	.167	3.224	.002	1.492
	Transportation Factors	.239	.090	.233	2.665	.010	4.251
	Infrastructure Factors	.191	.054	.221	3.551	.001	2.144

a. Dependent Variable: Average score Humanitarian Supply Chain Performance