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**ASSESSMENT OF PRACTICES AND FACTORS AFFECTING DOWNSTREAM
HUMANITARIAN SUPPLY CHAIN MANAGEMENT PERFORMANCE: THE
CASE OF WORLD FOOD PROGRAM ETHIOPIA**

By

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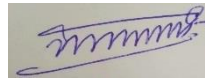
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Abstract

Downstream humanitarian supply chain management is one of the major functions in the supply chain management practice since it covers almost half of the operation performed in the humanitarian supply chain management. The main objective of this study was to examine the performance of downstream humanitarian supply chain management of World Food Program using the factors taken from the world bank logistic performance index these are customs practice, infrastructure, logistic quality and tracing and tracking with respect to the cost of logistics, responsiveness, agility, asset management, and reliability. The study also assesses the downstream humanitarian supply chain management practice of the World Food Program Ethiopia concerning transport management, inventory management, procurement practice, and warehouse management. The research design employed was descriptive and explanatory research type besides the researcher were used a quantitative research approach in conducting the study. The population of the study was employees of the World Food Program Ethiopia. Data was collected using email and analyzed using statistical package for social science. Descriptive analysis namely percentage, mean and standard deviation; and inferential analysis namely Pearson correlation and multiple linear regression were employed. The study indicated that transport management practice is a strongly agreed practice in WFP Ethiopia. The study also revealed that the performance measure questions reliability, responsiveness, and agility in the World Food Program Ethiopian were an agreed practice in the organization however cost and asset management were neutral. The study also showed there was a negative and significant relationship between customs practices and downstream humanitarian supply chain management performance of the World Food Program Ethiopia however, infrastructure & tracing and tracking were not significant to the performance of the World Food Program Ethiopia. The independent variables of customs practices and tracing & tracking had predicting power on the downstream humanitarian supply chain management performance of the World Food Program Ethiopia but infrastructure and logistic quality did not affect the organizational performance of the World Food Program Ethiopia.

Key words: Downstream humanitarian supply chain management practice, downstream humanitarian supply chain performance, factors affecting downstream humanitarian supply chain performance.

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Lists of Acronyms

DMTP- Disaster Management Training Program

DSHSCMP- Downstream Humanitarian Supply Chain Management Performance

FDP- Food Delivery Point

HO- Humanitarian Organization

ITF- International Transport Forum

IT- Information Technology

LPI- Logistics Performance Index

MT- Metric Ton

RBV-Resource Based View

RKC- Revised Kyoto Convention

SCOR- Supply Chain Operation Reference

SPSS-Statistical Package for Social Sciences

TPL-Third Party logistic

USAID- United States Agency for International Development

UNHRD- United Nation Humanitarian Response

UNHCR- United Nation Higher Commissioner for Refugee

UN- United Nation

WB- Word Bank

WFP- World Food Program

CHAPTER ONE

1. INTRODUCTION

This chapter contains the background of the study, statement of the problem, research questions, research objectives both general and specific objectives, significant of the study, the scope of the study, the definition of terms and organization of the study under the thesis topic Assessment of Practices and Factors Affecting the Downstream Humanitarian Supply Chain Management Performance the case of World Food Program Ethiopia.

1.1. Background of the Study

Ethiopia is a country with a population size of about 105 million that requires humanitarian assistance every year. As per the USAID fact sheet (2019), 8.9 million estimated population require humanitarian assistance.

The country hosts the second-largest refugee population in Africa, sheltering 905,831 refugees and asylum seekers as of 31 Aug 2018 as per UNHCR fact sheets published in August 2018 accordingly, makes the country demand a higher amount of humanitarian aids from the international, Local and Non-government organization every year.

To provide such huge humanitarian aid to countries like Ethiopia, highly integrated humanitarian supply chain management is vital and has a paramount effect on its efficiency and cost-effectiveness thereby improve performance. With this regard the researcher believes, efficient performance of the downstream humanitarian supply chain is a key component to be accessed to mitigate the challenges of humanitarian aid service.

Even though there are a handful of studies concerning humanitarian supply chain management, there are only a few studies done showing how the downstream humanitarian chain management affected and accordingly, its performance hindered.

Challenges and opportunities that are faced by World Food Program's Ethiopian in its downstream humanitarian supply chain management are assessed by the researcher to maximize the humanitarian aid operation and to meet the organization's broadly stated objective "Fighting Hunger Worldwide.

WFP Ethiopia operated its downstream operation with two corridors (ports): Djibouti & Berbera and with 8 logistics hub around the country with 247,000 MT storage capacity. WFP Ethiopia delivered some 290,000 MT food to beneficiaries around the country and

handles some 115,000 MT of food every month; In Somali Region, WFP reaches some 1160 final delivery points (FDPs) with 29,000 MT of food per round for Relief operations.(Unpublished UN WFP Filed monitor Training Document 2019).

These huge humanitarian operation faces a lot of challenges since humanitarian aid operation requires the integration of different parties for its success. Effective and efficient downstream humanitarian operations require to be agile it is also needs to be reliable while delivering the service it should also be responsiveness by making its cost reasonable, and manage its asset properly. Due to this reason cost, reliability, responsiveness, agility and asset management are considered an important element to bring better performance while coordinating parties involved in the downstream humanitarian operation.

1.2. Statement of the Problem

Based on a preliminary interview made with the WFP Ethiopia experts with the trusted area, the researcher found Downstream Humanitarian Supply Chain Management that needs intervention and research studies

These are.

Customs operation and customs clearance process at both Djibouti and Berbera Port. This includes the complexity of the port operation and the capacity of the port i.e berth efficiency, technical problems, bagging machine efficiency, long process of getting a pass at the port, and congestion of the ports.

Infrastructure is also another factor raised by the expertise such as road and IT related facilities, which has a direct impact on the performance of the downstream humanitarian supply chain management. Poor road infrastructure mainly affects the quality of transport service and also infrastructure related to technology mainly affects information technology capability of the organization that are under the downstream humanitarian supply chain. Hence, it affects the smooth flow of downstream humanitarian supply chain management. For instance, road seasonality in Ethiopia which is caused by poor road quality forced the operation of downstream humanitarian supply chain of the WFP Ethiopia to deploy heavy machinery and even to go for airdrop operation which is by far costly when compared to that of road operation in the downstream.

They also point out that security issues are also the other important factor that needs to be seen in the research because it is directly related to the concept of timeliness. It is obvious

that without timely delivered humanitarian aids it won't be possible to acquire the target of the humanitarian aid operation. So instability in the country which is the conflict between ethnic groups brings both social and economic glitches and then hinders the smooth flow of downstream humanitarian supply chain management and then affects performance.

The other important point that has been seen under this study as per the preliminary interview made with the experts was the logistic quality of logistics service providers engaged with downstream humanitarian supply chain management. There are different actors that are engaged with WFP Ethiopian downstream humanitarian supply chain management. There are times whereby the downstream humanitarian supply chain activity severally harmed due to internal conflict. Such as conflict among parties involved in the downstream humanitarian operation that would cause enormous operational delays in the lead time of the given supply chain operation. This might cause unexpected cost to be incurred in the overall operation and hinder performance.

The expertise also raised an issue of tracing and tracking which is mainly about the ability to track and trace consignments in the downstream humanitarian supply chain management. Most transports involved in the delivery of humanitarian aids do not have electronic devices on the truck that enable them to see their movement in real-time. This affects the overall supply chain decision-making activity. Hence, the absence of electronic devices that has harmed the downstream humanitarian supply chain management of the organization is going to be verified by the researcher.

Accordingly, based on the preliminary pilot interview made, the major factors which require in-depth research intervention were Customs Operation, Infrastructure, Logistics Quality, Tracing and Tracking, Timelines and International Shipment. This finding found to be consistent with World Bank's Logistic Performance Index indicators.

1.3. Research Question

The study covers the following specific research questions:

- How downstream humanitarian supply chain management is being practiced at WFP Ethiopia?
- What is the performance of downstream humanitarian supply chain management of the WFP Ethiopia?

- What are the factors affecting the performance of downstream humanitarian supply chain management of the World Food Program Ethiopia?

1.4. Research Objective

The study would like to address the following general and specific objectives:

1.4.1. General Objective

The overall objective of the study is to assess the practices and factors affecting the performance of downstream humanitarian supply chain management at the World Food Program.

1.4.2. Specific Objectives

The specific objectives of the study are:

- To assess the downstream humanitarian supply chain management practices of the World Food Program Ethiopia.
- To examine the performance of the downstream humanitarian supply chain management at the World Food Program Ethiopia.
- To assess factors affecting the performance of downstream humanitarian supply chain management in the case of the World Food Program Ethiopia.

1.5. Significant of the study

The study provides insight and will be used as a stepping-stone to other individual researchers who would like to carry out research works, not only on the specific subject but also in the areas of supply chain management. The findings will also apply to other similar organizations in Ethiopia that are engaged with the humanitarian operation. As for as its contribution to academics and theory, the study will provide the basis for a better understanding of the constitutive framework of factors for efficiency in humanitarian supply chain management, and hence, contributes to the cumulative learning and knowledge building process in the area of humanitarian supply chain management. The finding will provide humanitarian organizations in Ethiopia to have a yardstick to perform and make the required humanitarian impact in the domain of supply chain.

The study is significant to the WFP, as it enables them to identify the bottlenecks of the downstream humanitarian supply chain management and take corrective action as soon as possible to attain their ultimate goal in humanitarian operation.

Furthermore, the study will be an input to policymakers, to see the gaps related to infrastructures and policy issues to alleviate problems which are hindrances to the downstream humanitarian supply chain management.

1.6. Scope of the study

The research study particularly focuses on the practices, and factors affecting the performance of downstream humanitarian supply chain management of WFP Ethiopia. The research looked at factors affecting the performance of downstream humanitarian supply chain management as per the World Bank's standard of logistics performance index such as customs efficiency and customs clearance process at the ports, infrastructure the quality of trade and transport-related infrastructure, logistics quality which is competence and quality of logistics service and tracking and tracing.

Among the six factors, the International shipment did not include due to its focus which means it focuses on the upstream supply chain management and also the fifth factor that was timelines excluded because it measures the reliability of performance than being a factor. In doing so, the research considers supply chain professional who is directly involved in downstream humanitarian supply chain operation at the country office Addis Ababa, and 8 sub-offices these are Dire Dawa, Nazareth, Gambella, Gode, Jijiga, Kebridehar, Kombolcha, Mekele because most of the humanitarian supply chain management confined there.

1.7. Definition of Terms

Logistics: Lambert *et al.* (1998) define it as “Logistics is that part of the Supply chain process which plans different activities involved in the logistics operation and implements, and controls the result whether it gets efficient, effective or not when it passes through the flow and storage of goods, services, and related information from the place of origin to endpoint while from the point of origin to the point of consumption in meeting customers need

Supply chain efficiency: According to Beamon (1994) supply chain efficiency is the measurement of how well the resources expended are utilized. Supply chain efficiency is how well the resources in the supply chain are utilized.

Disaster: is a serious disruption of the functioning of a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community to cope using its resources. (WHO, 2019)

Customers: The primary customers of humanitarian organizations are the beneficiaries (those individuals that receive aid). However, donors are also increasingly being considered as customers in the humanitarian context as aid agencies provide them with the service of delivering aid to aid recipients Beamon and Balcik (2008). However, in this study customer implies beneficiaries.

Operational Definition:

Factors Affecting Downstream Humanitarian Supply Chain Performance: External factors that affect the performance of Downstream Humanitarian Supply Chain Management.

1.8. Organization of the Study

The study has five chapters. Chapter one discusses, the research problem, a brief overview of the research topic, research questions, research aim and objectives, and significance of the study is given. In chapter two the past literature related to downstream humanitarian supply chain management is covered, besides, the literature related to the role of logistics and supply chain management aids reviewed. In chapter three the research methods which are employed to complete this research study are thoroughly discussed, which include, research method, research approach, research sample and sample size, data collection instrument, reliability of the data collection instrument data analysis method, and ethical issues. In chapter four the result of the data analysis is presented, interpreted, and discussed while comparing it with the past literature. In chapter five, summary, conclusion, and recommendation are going to be presented.

CHAPTER TWO

2. RELATED LITERATURE REVIEW

This chapter briefly introduces and provides a brief review made by various researchers in the specific place of studies concerning practice, and factors affecting performance of downstream humanitarian supply chain management in the humanitarian organizations. It includes definition and concepts such as theoretical frameworks, humanitarian logistics and supply chain management, downstream humanitarian logistics operation from the organization perspective, empirical review related to the topic, and also conceptual frame seen in this chapter.

2.1. Theoretical Framework of the Study

This study is based on the Resource-Based Theory as discussed here below.

2.1.1. Resource-Based Theory

Based on resource-based view (RBV) organizations may achieve a desired competitive advantage through the bundling of strategic resources which are valuable, rare, inimitable, and non-substitutable Barney, (1991) while the RBV suggests that this is dependent on specific conditions. Visibility is one of the desired capabilities in the humanitarian supply chain leveraged to reduce the risk of poor coordination due to asymmetric information (Fawcett and Fawcett, 2013; Wang *et al.* 2017).

According to Eisenhardt and Martin (2000), Resource-based theory holds that the firm can be considered as a bundle of resources that are heterogeneously distributed across in this case, humanitarian organizations with enduring differences between them. This theory further suggests that a company must shelter an efficient package and flow of the right type of resources available from its working or places to stay important and pile up its performance (Rungtusanatham *et al.*, 2003). The theory elaborates as resources refer to physical such as tangible assets that include plants, equipment; as well as intangible assets such as knowledge, expertise, and other organizational assets existed in the organization. In line with this, competitive advantage can result from having shared ownership of or access to, unique or expensive assets like transport, innovations, and barriers to resources. It is these resources that can enable humanitarian organizations to influence competitiveness in humanitarian operations through the combination of such resources and

capabilities in a way that forms the core competencies of each humanitarian organization to be advantageous within a competitive market place.

According to Zacharia, Sanders, and Nix (2011), Resource-Based Theory is critical to many firms due to its competency in logistics and that it can be immense in its cost when trying to invest in it. Since sustainable competitive advantage in humanitarian organizations can have over a period and whose realization is pegged on the practicability of taking advantage of the resources that a company must achieve efficiency and effectiveness by utilizing even the resources it does not own.

Humanitarian organizations have therefore relied on outsourcing to gain access to other firm's valuable resources in the competitive market. With the growing need for such resources, humanitarian organizations searching and providing such services become reciprocally adapted towards one another and more value-dependent. The theory thus suggests that coordination enables firms to be accessible to complementary resources and create much more competitive resource bundles, providing them with a competitive advantage (Zacharia, Sanders & Nix, 2011).

2.2. Theoretical Literature Review

2.2.1. Downstream Humanitarian Supply Chain Management and Logistics

Nonprofit organizations and the organizations managed by donor funding implement a humanitarian supply chain for addressing the humanitarian issues of people at risk or disastrous location. The basic aim of the humanitarian supply chain is to transport the required supplies with adequate quantities to the disastrous situations at the right time when they are needed. The humanitarian supply chain is managed by the storage and flow of supplies and supporting materials maintain the cost-effectiveness, from point of origin up to the point where humanitarian supplies are needed (Oloruntoba & Gray, 2006). It is defined as the process of supplying humanitarian supplies and information with cost-effectiveness, from the point of storage where the supplies are stored to the point of consumption where they are needed, with proper planning and control within the given financial limitation. (Thomas, 2003). Humanitarian supply chain management includes a wide variety of functional activities, this kind of supply chain needs more efficient preparation to plan the aid for the people in disastrous location, with properly planned

procurement to transport the supplies on the location where they are desperately needed. In this process warehouse is also essential to track and trace the goods, in the case of international logistics custom clearance of goods is also necessary to transport supplies from one country to another (Thomas &Kopczak, 2005). In other words, logistics for the humanitarian institution is nothing but helping vulnerable people around us through the utilization of all our available resources and workforce with accurate information and skillful implementation processes.

The humanitarian emergency is all about accessing the displaced individuals and is greatly dependent on supply chain activities, an effective and agile supply chain is very essential in this regard. A supply chain consists of various activities, such as activities include transportation of goods, bidding and reserve bidding, procurement of supplies, management of the inventory in the warehouse, tracing and tracking of humanitarian supplies and last but not the least overall accountability and reporting to the concerned to report emergency requirement (Mbohwa, 2006). It also includes that deprived and needful population be the beneficiaries and take benefits from the fund of donation. The disaster supply chain needs to be managed and coordinated in such a way that the humanitarian organization achieves its goals through the processing of the supply chain system. The humanitarian supply chain assures that at the time of crisis, the organization of humanitarian obtains the true value for money regarding the procurement of supplies and services (Yadav & Barve, 2016).

Humanitarian supply chains need to be more efficient, agile, and well prepared to manage and aid the needful, humanitarian organizations facing many challenges in fulfillment of their responsibilities. They could face massive demand uncertainty due to lack of information because the need for supply could be changed extensively and so workers in a humanitarian organization always face the unknown (L'Hermitteet *al.*, 2016). De Leeuw and Mok (2016) suggested that the accessibility of supplies to aid these kinds is situation requires warehouse on a strategic location, to make sure the availability and to respond rapidly. In a broader perspective using intermodal transportation results in continuous replenishment with the decreased delivery cost.

2.2.2. Measuring Performance of Downstream Humanitarian Supply Chain Management.

The ultimate goal of humanitarian logistics is to provide support to disaster victims in the form of food, shelter, clothing, medicines, water, etc. Like their commercial counterparts, humanitarian logistics also need to have a performance measurement scheme to judge if the operations are failures or successes. According to Gunasekarana, (2004), performance measurement and metrics are crucial for organizations in setting up objectives and future directions. Performance measures are objective and quantitative indicators of various aspects of the performance.

According to Neely, Gregory, and Platts, (1995), performance is defined and measured as the process of computing the usefulness and proficiency of action in a given organization. Effectiveness is related to what extent the level of customers' needs are covered while efficiency measures how economically these needs have been covered (Schulz & Heigh, 2009). Effective performance measurement systems would assist relief chain practitioners in their decisions, help improve the effectiveness and efficiency of relief operations and demonstrate the performance of the relief chain, thereby increasing the transparency and accountability of disaster response. Metrics that are most important in an organization should be used to develop an appropriate organizational performance measurement system (Gunasekarana, 2004).

To measure performances of an organization different models can be applied. Out of them a popularly accepted performance measurement model developed and endorsed by the supply chain council as a cross-industry standard for supply chain management called the Supply Chain Operations Reference (SCOR) model can be mentioned (Thilakarathna, Dharmawardana, and Rupasinghe, 2015).

2.3. Empirical Literature Review

2.3.1. Downstream Humanitarian Supply Chain Management from WFP Perspective

WFP logistics in Ethiopia manages the downstream supply chain starting with the receipt of food at Djibouti port and or Barbara Port and finishing with the delivery and handover to the government counterparts at predefined points except for the Somali region. Thereafter WFP maintains a monitoring role while the delivery and distribution are carried

out by the government. WFP is responsible for the whole supply chain and delivers to beneficiaries around more than 300 final delivery points (FDP). Besides, upon arrival of the vessel in Djibouti, WFP Addis Ababa requests the contracted road transporters to make trucks available as stipulated in the contracts i.e. primary transporters those working from the port of arrival up to intended destination or WFP Hub or government warehouse. The role of secondary transport delivers the food from the predefined hubs to different delivery points (FDPs). (Unpublished UN WFP Logistics Operation Manual, 2009).

2.3.2. Challenges in Downstream Humanitarian Supply Chain Management.

According to the research carried out by Nyamu (2012) about the impact of supply chain management challenges facing humanitarian organizations in Kenya have two objectives: to establish the challenges facing humanitarian supply chain management in Kenya and to define the cause and effect of supply chain challenges on the performance of humanitarian organizations in that has been conducted in Kenya. The study adopted a descriptive survey research design where a sample of 40 humanitarian organizations was conducted. Factor analysis was also conducted to establish the main challenges facing humanitarian supply chain management in Kenya. The findings of the study indicated that the main challenges facing humanitarian SCM were lack of recognition of the role of supply chain management in humanitarian operations, delay in humanitarian operations due to domestic barriers, demand uncertainty, challenges in accessing affected population due to inadequate transport modes, high costs inhibiting accessibility of the affected areas and inability to anticipate disaster. The effect of supply chain challenges on the performance of humanitarian organizations was a delay in the delivery of the right products, poor information integration, and uncertainty demand among others. However, the study did not look at possible solutions to the challenges faced by humanitarian organizations.

According to Mohamed (2012), research conducted to establish supply chain management practices being implemented by humanitarian organizations in Kenya and their impact on performance. The study pointed out the main challenges humanitarian organizations encounter in Kenya which included customs and habits in the relief area, lack of financial resources, inability to anticipate disaster, bulky materials to be transported, demand, and supply uncertainty. The study, however, did not prove an in-depth description of the

possible solutions to overcome the supply chain challenges faced by humanitarian organizations.

The Disaster Management Training Program (DMTP, 1993), identified transportation and communication infrastructure as one of the barriers to the effective delivery of aid. Disaster may degrade the infrastructure of the area and halt humanitarian operations all in all. Besides, disasters occur in areas where transportation infrastructure is in poor situations and would not hold the huge number of refugees, vehicles of the various party involved in the aid operation, and various shipments that come in during a disaster. The solution provided for this challenge was that parties involved in the disaster operation to operate case by case because of the unpredictable effect of disaster and the vulnerability of the infrastructure in this particular case. Communication was also been mentioned as one of the challenges facing humanitarian organizations.

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 are therefore important and must be implemented in areas of humanitarian supply chain practices. The coordination problem causes humanitarian organizations not to perform effectively during emergency response and made worse the relationship between organizations to share the information which is vital to resolve the disaster situation and this will ultimately lead to duplicated and wasted resources valuable for the operation (PAHO, 2000).

Christopher & Tatham (2011) identified challenges facing humanitarian supply chain as coordination of operations of a large number of unrelated organizations 20 varying of materials and services from disaster to disaster; human resources availability, which is often made up of volunteers with little to no training, the scope of the individual disaster, which is always different, differences in the operating environment and the respective politics, which may require compromise.

2.3.3. Downstream Humanitarian Supply Chain practices.

Different research has been made concerning supply chain practice in the area of transport management, inventory management, procurement practice, and warehouse management. However, the researcher did not find specific research made on downstream humanitarian

supply chain practices. Hence, the researcher would like to observe the WFP Ethiopians downstream humanitarian supply chain management practice.

2.3.3.1. Transport Management

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.

According to Thomas, (2003). Management of the distribution function has to be an important part of the management system. Moreover, the activities of each function have to be closely linked with the other activities to avoid delays in the logistics flow. Physically and conceptual link between function make the function to be compatible. For instance, one can make the distribution process to be healthier and establish various distribution menses comprised of redundant routes and delivery methods for supplies (Coyle and others, 2003:107-109). Likewise, the distribution mechanism has to be built-in to allow for balancing between transportation costs and service level. (Coyle and others, 2003:340)

Transport costs have significant impacts on the structure of economic activities as well as on international trade. Empirical evidence underlines that raising transport costs by 10 percent reduces trade volumes by more than 20%. In a competitive environment where transportation is a service that can be bided on, transport costs are influenced by the respective rates of transport companies, the portion of the transport costs charged to users. Matiws Ensermu, (2006).

2.3.3.2. Inventory Management

According to Merminod *et al*, (2014) the most effective and efficient way of response to any disaster is made possible by careful pre-positioning of inventory and wise allocation of resources.

To gain the maximum benefit out of the inventory prepositioning, a group of a humanitarian organization must develop shared centralized areas called Depots “United Nations Humanitarian Response (UNHRD)” for pre-positioning of contingent inventory to reply to disasters caused worldwide. The depots have been established at six different locations: worldwide Dubai, United Arab Emirates, in the Arab countries, in Europe Brindisi, Italy; and Las Palmas, Spain South America Panama City, Panama; in Asia Kuala Lumpur, Malaysia; in Africa Accra, Ghana. The UNHRD partners found in these areas claim that the strategy of centralized depots enables them to respond to any disaster anywhere in the world within 24 to 48 hours so does the inventory preposition in their inventory management practice. (Dufour, Laporte, Paquette and Rancourt 2018).

2.3.3.3. Procurement Practices

Procurement in Humanitarian Organization is the gaining and obtaining activity of services and or goods and it also includes leasing during and after a disaster happens that enables the delivery of aid to vulnerable communities. In the humanitarian organization, supply-chain management and logistic operations took 65% of the procurement budget. A system of transparent and accountable management is, therefore, an important activity to be made. These including requisition and, identification of needs, announcement, and evaluation of tenders, delivery of supplies, purchase orders inspection of supplies, and payment to vendors, etc. (Falasca, Zobel 2011).

Transparency and accountability in humanitarian organization logistic and supply chain management procurement activities be ensured through standardization of process while closely applying information technology to it. (Falasca, Zobel 2011).

Therefore, a standardized procurement process framework especially to bid announcements has to be developed, bid construction, and bid evaluation phases also carefully managed. The bid announcement phase is considered challenging and hence needs careful development of criteria for factors like deliveries, timing, and bid evaluation. Subject to an unstable environment there are unusual situations whereby suppliers can take decisions to construct their bids in keeping with the required place of deliveries whereby disasters happened in timeframes and other essential requirements (Trestail, Paul, Maloni 2009, Ertemet *et al.* 2010).

2.3.3.4. Warehouse Management

Warehousing management becomes very important because it contributes to cost improvement in the logistics system (Liviuet *al.*, 2009). Good warehouse management contributes to better cost management and quality both in terms of service given to customers and the quality of the resulting product. (Ackah and Eric, 2016; Speh, 2009). One of the best practices in a good management warehouse is performance measurement which can be used to improve warehouse to be more effective and efficient. Performance measurement is useful for the manager to carry out some improvement action base on periodic review.

Warehousing also plays an important role in the supply chain. Despite all of the integration initiatives, supply chains will never be so well coordinated that warehousing can be eliminated. Frazelle (2002) states that warehouses are important for a supply chain because they provide storage for raw materials, components, work-in-process, and finished goods; operate as distribution and order fulfillment centers, and perform localized and value-added warehousing.

2.3.4. Downstream Humanitarian Supply Chain Management Performance.

According to, Thilakarathna, Dharmawardana, and Rupasinghe, (2015) there are five performance attributes that should be considered in assessing the performance of a logistics function in place. These performance attributes are delivery reliability, responsiveness, flexibility, cost, and asset management efficiency. The first three (delivery reliability, flexibility, and responsiveness) attributes are those facing towards customers while the next two (cost and asset management efficiency) are those facing towards the organization. Delivery reliability is about the performance of the logistics function in delivering the right product to the right beneficiary at the right time and right quantity. Responsiveness on the other hand emphasizes the speed at which the logistics function provides products to the beneficiaries. Flexibility is about the ability in responding to changing demands in terms of both variety and volume. Cost stands for the costs associated with running the logistics function while asset management efficiency is about efficiency in managing assets to satisfy beneficiaries' demand.

Hence, the researcher would like to focus only on cost, responsiveness, agility, and asset management.

2.3.4.1. Cost of logistics

The study result on analysis of third-party logistics performance and service provision 2011 suggests that excellence in operations is more important than wide-ranging service provision.

Furthermore, the cost has always been a vital element in evaluating the logistics performance of a given industry (Andersson *et al.*, 1989; Banomyong & Supatn, 2011). Logistics management impacts not only the profit and loss account of the business but also the balance sheet. Logistics is also increasingly being recognized as having a significant impact upon economic value-added and hence shareholder value. Decisions on logistics strategies made based upon a thorough understanding of the impact they will have on the financial performance of the business (Christopher *et al* 2004).

2.3.4.2. Responsiveness

According to the research done in Korea, all flexibility related variables, namely ability to adjust order quantities and order specifications, distribution system flexibility, and ability to react to market fluctuation were considered relatively high in importance but low in satisfaction. Evaluating factors affecting logistics customer service performance for car manufacturing companies in Korea through the structural equation model found the relationships between customer service factor across the other factors (flexibility, IT system, inventory, and responsiveness factors) and relationships among the others (Youlet *al* 2006).

Many firms have been evaluated performance, primarily based on cost and efficiency (Skinner, 1971). Besides the financial measures, we now have the non-financial measures which include time, quality, and flexibility. Time element has strategic importance in business and hence time has to be used as a strategic metric in performance measurement (Stack *et al*, 1990) (Ira Haavisto, (2014).

2.3.4.3. Agility

The humanitarian sector is highly experienced in agility management by applying various methods for emergency planning and pre-positioning of inventory whenever needed. There

are also techniques recommended for humanitarian organization logistics and supply chain management in order agility to be strong so that communication with its partners about the current situation, selection of the quick responder nearest suppliers, postponement of supplies, buffer stock, and creation of third party logistics relationship and formation of emergency response team (Christopher, 2005). Being agile in the provision of humanitarian services is a challenging duty since there are many uncertainties, complexities, and the unknown humanitarian demand for humanitarian activity on time, yet it is almost an overbearing activity in humanitarian organization logistic and supply chain management, especially in disaster operation response which usually arise suddenly and in great proportion (Cozzolino *et al.*, 2012). The capability of an agile response can be assessed by recognizing the agility matrix that is based on an agile framework (Charles *et al.*, 2010). On the other hand, business organizations can also measure their agility on the bases of customer sensitization, processes mixing, network integration, and virtual integration (van Hoek, Harrison, Christopher, 2001, Merminod *et al.* 2014).

According to, Ehsan Moeiny, Javad Mokhlesi, (2011) the agility of a supply chain returns to its ability to respond to new changes rapidly. To make a supply chain the visibility of the velocity of the supply chain must be taken into consideration.

He further explains the concept of velocity to describe agility as velocity is dependent on the distance and time. To increase the velocity of the chain it's crucial to reduce the time. Time reduction can be addressed by following three main approaches.

At first, re-engineering some processes by simplifying them and increasing the parallel processes rather than series. Then, reduction of lead-time must be gained through selecting the proper source of supply and suppliers that are capable of responding to change in volume and type of requirements and by synchronizing the planes using the shared information.

2.3.4.4. Asset Management

In the relief chain, stock can accumulate in many places. Collection sites can act as transshipment points, warehouses, and as places to prepare and pack goods. They can be located in impacted areas or near ports, border crossings, or airports. Stock Asset Management is the process of organizing warehouses at certain points and organizing the supplies held in those warehouses, for delivery. Warehouses and transshipment points

should be located strategically to use the available infrastructure guaranteeing safety conditions for the assets and people. Usually, during the response phase, warehouses are prepared. There were only two main storage points in Haiti immediately following the earthquake. These were located on the grounds of the presidential palace and next to the airport. Once the aid arrived at these points, it proved extremely difficult to transport it further to the population in need. At this stage, notification of the receipt of the goods should be sent, records of inbound supplies should be maintained, and supplies must be secured to prevent theft and spoilage. Loads should be inspected to ensure that they correspond to the shipping papers and that they are not contaminated. If goods are contaminated, reverse logistics come into play. The goods must be returned, given to livestock, or destroyed. (Ehsan Moeiny, Javad Mokhlesi, 2011).

2.3.5. Factors Affecting Downstream Humanitarian Supply Chain Management Performance.

The World Bank's Logistics Performance Index (LPI), also known as the "Connecting to Compete" report, provides the most comprehensive international comparison tool to measure the trade and transport facilitation friendliness of countries.

Understanding the components of trade and logistics performance can help countries improve their freight transport efficiency and identify their areas of weakness and strength in comparison to competitors. The "Connecting to Compete" report has been published in 2007, 2010, 2012, 2014, 2016 & 2018.

The LPI has two main parts: the International LPI, where up to 166 countries are benchmarked against each other, and the Domestic LPI, which provides an insight on a set of logistics conditions within each country.

The International LPI looks at six dimensions that capture the most important aspects of countries trade logistics performance, where each dimension is rated on a 5-point scale (Arvis, *et al.*, 2014):

Among the six dimensions that are used for the measure of logistics performance index set by the World Bank, four of them has been used for the research purpose and assess their respective effect on the downstream humanitarian logistics performance of WFP.

(A) Customs practice, (B) Infrastructure; especially transport-related infrastructure. (C) Logistics Quality; which is about competence in the area of logistics services. (D) Tracking and Tracing; ability to track and trace consignments.

2.3.5.1. Customs; efficiency of the customs clearance process.

According to the study made on drivers of logistics a case study of Turkey 2015, the customs practice dealt with components about logistics performance index that measures the efficiency and effectiveness of customs like dispatch procedures concerning speed, simplicity, and predictability. Better results in customs performance are tied to the general trade environment. Customs performance covers risk management, prime use of a resource such as information and communications technology, well-managed partnership with the different sectors especially with the private sector including programs to improve compliance, increased cooperation with others by harmonizing trade policies and reduce administrative complexities.

Clearance means the accomplishment of the Customs formalities necessary to allow goods to enter home use, to be exported, or to be placed under another customs procedure as per Revised Kyoto Convention (RKC). The key measures proposed aim to expedite the clearance and release of goods at the borders. These measures include, inter alia, pre-arrival clearance, a separate release from clearance, authorized trader schemes, risk management, and post-clearance audit. Customs modernization through automation and ICT use is a useful step in implementing such procedures (UNCTAD, 2008).

According to Bates *et.al* (2007), the purpose of an effective and efficient importation and the port-clearing process is to ensure that imported supplies are cleared from land, sea, airport, with the least possible delay after their arrival the study indicates as port delays would have brought costly consequences, such as- reduced shelf life or, for other very temperature-sensitive items, loss of effectiveness, deterioration of the product, damage to product cartons and packaging or damage to outer identification, increase the chance of theft, Storage fee (demurrage), which can result in high costs.

To understand customs procedures on an operative level, a brief introduction to some elements is necessary. As the international supply chain might be long and complex, different kinds of information are needed as consignments move along the supply chain. In general, the movement of consignments in the chain entails various contracts between

sellers, buyers, and carriers. For example, a bill of lading is a document that enables a consignor to assign goods to the carrier, who will only be able to deliver these goods in agreed condition to the consignee, who possesses the bill of lading (Hesketh, 2010).

Another type of document is the manifest, which is based upon the bill of lading or any other document that approves receipt and condition. The manifest contains a list of all cargo loaded on a vehicle, and this type of document is the most relevant for customs administrations. Documents related to the shipment of goods can travel along with the actual goods, but also ahead of or behind the goods in the supply chain. In other words, as Van Baalen, Zuidwijk and Van Nunen (2009) suggest, there are three different kinds of flows in the supply chain: physical, information, and financial flows. Since the objective of customs is to provide security in the supply chain, customs deals with all three flows. (Hesketh, 2010)

Globally, in low-income and lower-middle-income countries, customs efficiency is one of the two hindering components of the LPI in 2014, especially even after countries have made the fastest development in this dimension (Arvis, *et al.*, 2014).

H1: Customs clearance practice has a significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

HO: Customs clearance practice has no significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

2.3.5.2. Infrastructure; quality of trade and transport-related infrastructure.

Infrastructure quality of trade and transport-related infrastructure is the second dimension in the LPI. A low overall logistics performance index results from poor scores for infrastructure. Poor transport infrastructure considered one of the main reasons for separating countries from one another and thus hinder their participation in global activities. For instance, the average landlocked country has transport costs 50% higher than the counterpart country with the coastal economy. Conversely, improving the infrastructure of the landlocked countries to the top reduces this difficulty or demerit of the effect of infrastructure by 12%; and improving the infrastructure of the transit economy by a further 7% (Limao&Venables, 2001).

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 well-developed road infrastructure, for example, facilitates 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 facilitates, for example, the delivery of relief aid.

The infrastructure dimension of the logistic performance index contains both telecommunications and physical infrastructure. However, perceived differences in the quality of infrastructure are strongly linked to the quality of the road facilities, which are the modes of freight transport. According to Celebi *et al.*, (2014) there is a strong relation between which is also positive at the country's logistics performance index score and the quality of their transport-related infrastructure, particularly the road quality (Celebi, *et al.*, 2014).

The government plays a major part in keeping transport infrastructure in good condition since road infrastructure is the responsibility of the governments. Superior transport infrastructure also enhances and adds value to a greater extent by supporting intermodal transport systems, including access roads and terminals and seaport channels (OECD/ITF 2015).

H2: Infrastructure (Quality of trade & transport-related infrastructure) has a significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management Performance.

HO2: Infrastructure (Quality of trade & transport-related infrastructure) has no significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

2.3.5.3. Logistics Quality; competence and quality of logistics services.

This dimension masseur and look at the competence and quality of logistics services provided by parties within the logistics system. Achieving the best logistics performance in this dimension requires continuous improvement in responsiveness, reliability, and well-functioning support services. The devoted investments in logistics activities and the adoption of continuous monitoring and recognized quality this dimension are mainly done by the private sector. International trade in goods is facilitated by the quality of logistics services which plays an important role in this respect. (OECD/ITF 2015).

According to Berglund *et al.* (1999), third party logistics (TPL) defined as activities performed by a logistics service provider on behalf of a shipper which deals with at least management and execution of warehousing management and transportation services.

Other activities include information services, value-added activities, call centers, including invoicing and payment services. In this definition, management support is required in addition to the operational activities. Management support can range from simple inventory management to advanced consultancy about re-alignment of supply chain management.

Bagchi and Virum (1996, p. 193) distinguish between simple outsourcing of logistics activities and logistics alliances. According to their definition, a logistics alliance means:

A long-term formal or informal relationship between a shipper and a logistics provider to render all or a considerable number of logistics activities for the shipper. The shipper and the logistics provider see themselves as long-term partners in these arrangements. Although these alliances may start with a narrow range of activities, there is a potential for a much broader set of value-added services, including simple fabrication, assemblies, repackaging, and supply chain integration.

In contrast to the first definition, which emphasizes the performance of functional activities, the last definition stresses the duration of the relationship between the shipper and the logistics service provider, including the potentially wide range of logistics services in the arrangement. The logistics performance index further reveals that the quality of logistics performance in both emerging and developed economies (Arvis, *et al.*, 2014).

Analysis of the impacts of trade logistics in a given country's trade by income category indicates that trade flows are impacted by competence by similar magnitude regardless of the country's development level of development such as logistics services (third-party logistics).

Government actions can help the private sector to develop its logistics competencies. These include increasing managerial capacity, regulating business certification, and ensuring standardization of operations and by setting quality standards developed by professional organizations. Moreover, logistics competence requires new labor force skill sets and more highly educated employees to foster its effect.

An adequate workforce should be secured to meet future demanded labor needs in the logistics industry, decisive political determinations are also a determinant factor in the logistics industry (International Transport Forum, 2014).

H3: Logistics quality has a significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

HO3: Logistics quality) has no significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

2.3.5.4. Tracing & Tracking; ability to trace and track the consignment.

Tracing & Tracking; is about the ability to track and trace consignments; the development of ICT gives a convenient means of improving logistics performance index of tracking and traceability performance by enabling the gathering of information organization and distribution to be cost-efficient, at a global level. This includes information about trade regulations on products and services. Several companies use the internet as a major means of mechanism for planning with their partners.

However, most developing countries faced a problem concerning adequate traceability of shipments. This is partially due to a lack of using technology and regulate logistics procedures whenever demanded. Though it is clear that information sharing create benefit to the supply chain as a whole there are difficulties when it comes to how to apply it properly (OECD/ITF 2015).

There is a growing interest in the tracking of shipments and conveying the tracking information to customers. It is considered an important customer service component and it is often considered industry norms rather than a potential competitive advantage for logistics service providers (LSPs) (Day, 1991). Industries are investing a considerable amount of money to providing tracking services to their customers (Toyryla, 1999). With this tracking and tracing service providers' customers being able to locate shipments in-transit, hence they plan and monitor their operations.

In the case of handling goods by one company, contemporary tracking systems might be work well but tracking global supply chain networks, traditional tracking approaches do not suit. Multi-company supply networks are generally performed through making tracking information available via a Web page, resulting in manual interrogation for customers (Martinez-Sala *et al.*, 2009).

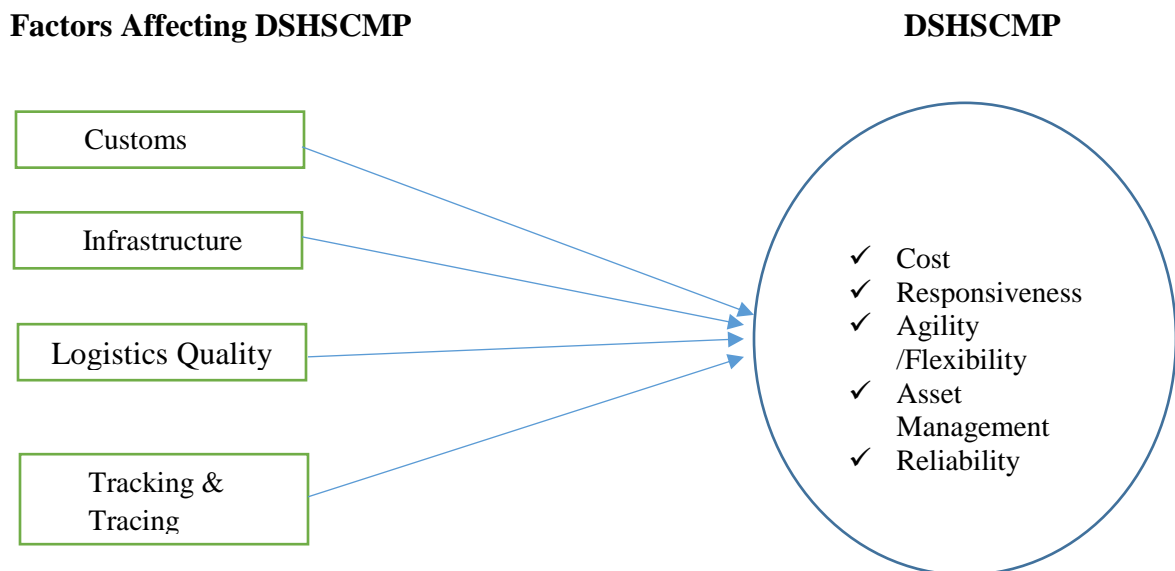
Tracking of the supply network often used to describe a product in the forward direction, whereas tracing is used to infer the product’s path and history from downstream to upstream of the supply chain (Dabbene *et al.*, 2014). Without proper coordination of logistics information, it would be difficult to achieve efficient tracking systems. By linking real-time information flow tracking systems would be able to detect and react to unexpected events. It supports also to resolve events before they cause significant problems or at least minimize the damage. The supply chain tracking enables companies to support managers in choosing activities, methods, and technologies to increase supply chain security without reducing its efficiency (Pero and Sudy, 2014).

H4: Tracking and Tracing (ability to track and trace consignment) has a significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

HO4: Tracking and Tracing (ability to track and trace consignment) has no significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.

2.4. Conceptual Framework of the study

Some factors affect the performance of humanitarian downstream supply chain management of the WFP Ethiopia that is involved in the downstream humanitarian operation. The researcher assumes the following as a conceptual framework of the research study.



NB: The variables considered to assess downstream humanitarian supply chain management practices are transport management, inventory management, procurement practice, and warehouse management.

Figure 1: Modified from (OECD/ITF (2015) and Thilakarathna, Dharmawardana, and Rupasinghe, (2015).

2.5. Literature Gap

The review of literature in the context of humanitarian logistics indicates that researchers have begun to lay out the foundation for a core body of knowledge. Prominent researchers in this field of the study state that academic research in humanitarian logistics and supply chain management is still in its infancy (Tatham *et al*, 2009). There is a growing body of research in humanitarian logistics. However, there is a need for calls for empirical research to be made on downstream humanitarian supply chain management because there is only a few research made on this topic.

Even though, much as been said in different literature review concerning humanitarian logistics there are few mentions about downstream humanitarian supply chain management, which is almost half the operation of the given supply chain. To narrow the gap different research has to be conducted so that complexity and challenges would be early identified and the ultimate goals of humanitarian organizations will be fulfilled.

Thus, this study contributes by exploring and empirically testing how the performance of the WFP Ethiopia downstream humanitarian supply chain management is affected by external factors that are out of the control of the organization.

CHAPTER THREE

3. METHODS OF THE STUDY

The purpose of this chapter is to describe the research methodology and techniques that were conducted in the study. In this chapter, the practical methods used to answer the research questions and fulfill the purpose of the research are presented.

3.1. Description of the Study Area

The study was intended to create an awareness and understanding of the relationship that exists between downstream humanitarian supply chain performance (dependent variable) and factors affecting downstream humanitarian supply chain management (independent variable), in the WFP Ethiopia.

The WFP Ethiopia is currently working at Dire Dawa, Nazareth, Gambella, Gode, Jijiga, Kebridehar, Kombolcha, Mekele, and Awassa. The head office is found in Addis Ababa. The study has covered main hubs where most of the humanitarian operations handled. These are country office (Addis Ababa), and 8 sub-offices Dire Dawa, Nazareth, Gambella, Gode, Jijiga, Kebridehar, Kombolcha, Mekele sub-office since an enormous amount of operation taking place in these particular offices.

3.2. Research Approach

To achieve the objective and provide a conclusive answer for the research questions outlined and to test the hypothesis, the study considers a mixed approach, qualitative and quantitative methods. Even though a mixed approach was applied for the data collection the researcher heavily depended on the quantitative approach. By doing so the researcher better-explained realities, and triangulate findings of the quantitative data.

3.3. Research Design

The researcher used descriptive and explanatory research designs. The Descriptive research design employed because it enables us to understand and systematically describe factors affecting downstream humanitarian supply chain management and downstream humanitarian supply chain management performance of WFP Ethiopia.

The explanatory research designs are concerned with determining the impact of cause and effect relationships among variables. Therefore, the research used descriptive and

explanatory research design to give an adequate depiction and indicated the association between the factors affecting downstream humanitarian supply chain management and downstream supply chain management performance of the WFP Ethiopia.

3.4. Population and Sample

The population is all individuals of interest to the researcher (Geoffrey, David & David, 2005).

As per the actual data obtained from WFP Ethiopia total employees under the supply chain department at the country office and all sub-offices are 154. To determine the sample population the following inclusion criteria applied: a) Respondent must have a work experience of one year and above, b) Respondent work description should be directly related to the downstream humanitarian relief operation. C) Respondent work station should be Addis Ababa (Head Office) and the following sub-offices Dire Dawa, Nazareth, Gambella, Gode, Jijiga, Kebridehar, Kombolcha, Mekeleand then the sample population becomes 95.

The researcher used these inclusion criteria to get quality data and to avoid confusion among the respondent while filling the questionnaires. Also, the research has been conducted under the scope outlined in chapter one of the study.

3.5. Data Source and Types

Both primary and secondary sources of data were used. Primary sources have been collected to realize its objective and to describe the relationship between the independent and dependent variables and to see employee's perception, the study will collect most of the data using a survey questionnaire. The data collected from employees of the WFP Ethiopia country office and some selected sub-offices and area offices. Secondary data also collected from different sources like the supply chain manual of the organization, reports, books, and published and unpublished documents to make the study comprehensive.

3.6. Data Collection Procedure

Information that has been used in the study were collected through a questionnaire. The questionnaire prepared to be self-explanatory, and it allowed categorizing factors of humanitarian performance to answer the research questions, based on different works of literature on supply chain functions. The questioner has three major parts. The first part is

about the questioner was about respondents' background information like gender, age, education, experiences in the WFP Ethiopia, and duty station. The second part contained a 5-point "Likert" scale with 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, and 5 = Strongly Agree. The questioner has three sub-sections the first section is about humanitarian downstream supply chain management practice at WFP Ethiopia. Under this section, there were four subsections with a total of 19 questions. The second section deals with factors affecting downstream humanitarian supply chain management performance. This section has five subsections with a total of 22 questions. Finally, the third section evaluates the humanitarian supply chain performance concerning cost, responsiveness, agility, asset management, and reliability to understand the perception of employees of WFP Ethiopia.

3.7 Data Analysis

After data collected through questionnaires, its completeness was verified, coded, and entered using SPSS. The data was subject to analysis using an application software packages named Statistical Package for Social Sciences (SPSS) version 20. Data analysis was performed using descriptive and inferential statistics. According to Boone and Boone (2012), Likert scale data are analyzed at the interval measurement scale. Likert scale items are created by calculating a composite score (sum or mean) from four or more type Likert-type items; therefore, the composite score for Likert scales should be analyzed at the interval measurement scale. Descriptive statistics recommended for interval scale items include the mean for central tendency and standard deviations for variability. Additional data analysis procedures appropriate for interval scale items would include the Pearson's r , ANOVA, and regression procedures.

3.7.1 Descriptive Statistical Analysis

Descriptive statistics were used to describe different characteristics. Frequencies and percentages were used to analyze general information about respondents, mean and standard deviation were used to describe aspects of downstream humanitarian supply chain management practices and factors affecting performance. The mean was preferred as it considers the precise score of each case thus it incorporates more information than the median which only states a score relative position. The standard deviation, on the other

hand, was used to measure variation. The results were presented using tables accompanied by explanations.

3.7.2 Inferential Statistical Analysis

In Inferential statistical analysis, correlation and multiple linear regression analysis were used to determine the relationship between the independent variable (factors affecting downstream humanitarian supply chain management) and dependent variable (downstream humanitarian supply chain management performance); and to test the effect of factors affecting downstream humanitarian supply chain management on downstream humanitarian supply chain performance respectively. The results were presented using tables.

Every table was accompanied by result interpretation.

3.7.2.1 Correlation Analysis

Correlation may be defined as the degree of the relationship existing between two or more variables (Koutsoyiannis, 1977). The correlation coefficient (r) is a measure of the degree of co-variability of the variables. The values that the correlation coefficient may assume vary from -1 to $+1$. When r is positive, there exists a positive correlation between the variables. $r = +1$ implies that there is a perfect positive correlation between variables. When r is negative, there exists a negative correlation between the variables. $r = -1$ implies that there is a perfect negative correlation between variables. When r is zero, then the variables are uncorrelated. The closer the value of r is to one, the greater is the degree of co-variability. On the other hand, the closer the value of r is to zero, the lesser is the degree of co-variability.

The quantity r , called the linear correlation coefficient, measures the strength and the direction of a linear relationship between two variables. The linear correlation coefficient is sometimes referred to as the Pearson product-moment correlation coefficient in honor of its developer Karl Pearson (Samuel and Okey, 2015).

As a statistical estimate, r is inevitably subject to some error and should be tested for its reliability by conducting some test of significance (Koutsoyiannis, 1977). While

computing a correlation, the level of significance shall be set at 95% with an alpha value of 0.05).

3.7.2.2 Multiple Regression Analysis

According to Gujarati (2004), the term regression was introduced by Francis Galton. Regression analysis is concerned with the study of the dependence of one variable, the dependent variable, on one or more other variables, the explanatory variables, to estimate and/or predict the (population) mean or average value of the former in terms of the known or fixed (in repeated sampling) values of the latter.

The multiple regression analysis was used to determine whether factors affecting downstream humanitarian supply chain management will influence the downstream humanitarian supply chain performance of WFP Ethiopia. The study takes the four determinant factors as independent variables and the DSHSCM performance as the dependent variable in the regression model. The study used the following multiple regression model to establish the statistical significance of the independent variables on the dependent variable.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon$$

Where; Y = DSHSCM performance

X1 = Customs practice

X2 = Infrastructure

X3 = Logistics quality

X4 = Tracing and tracking

In the model, β_0 = Constant, β_1 to β_4 = Regression coefficients represent the mean change in the dependent variable for one unit of change in the independent variable while holding other independent variables in the model constant and ϵ = Error term which captures the unexplained variation in the model.

3.8. Validity and Reliability of the study

3.8.1. The validity of research Instrument

Validity is the extent to which a test measures what it claims to measure (Lakshmi and Mohideen, 2013). A measure is valid if it measures what it is supposed to measure. According to Kindy et al. (2016), content validity is the extent to which the items in an

instrument covers the entire range of the significant aspects of the area being investigated. It is the degree to which the measurement device, in this case, the measuring questions in the questionnaire, provides sufficient coverage of the research investigative questions. To maintain the validity of the instruments, most of the questionnaires were adopted from previous researches. Some of the questionnaires were developed based on a careful review of the literature. Besides, pilot testing of questionnaires was conducted to obtain feedback from the experts on validity, and responses were collected and the questionnaire was adjusted subsequently.

3.8.2. Reliability of research instrument

In the main study phase, the researcher tries to brief for respondents to give serious attention while providing necessary information and completing the questionnaire presented; accordingly assure them their feedback will be kept secure. The reliability test has been checked whether the questionnaire consistently reflects what it means to measure or not.

According to Tavakolet *al.* (2011), Cronbach's Alpha value ranging from 0.70 to 0.95 is acceptable for the test of reliability. Cronbach's alpha has been applied to measure internal scale consistency using SPSS software.

Table 3.1 Cronbach's alpha reliability test

No.	Instrument dimension	Cronbach's Alpha	No. of items
1	Customs Practice	0.766	5
2	Infrastructure	0.832	5
3	Logistic Quality	0.729	4
4	Tracing Tracking	0.906	4
5	Transport Management	0.871	4
6	Inventory Management	0.896	5
7	Procurement Practice	0.830	5
8	Warehouse Management	0.855	5
9	Cost	0.781	4
10	Responsiveness	0.814	4

11	Agility /Flexibility	0.919	4
12	Asset Management	0.893	4
13	Reliability	0.749	3
	Overall	0.881	56

3.9. Ethical Consideration

To avoid hostile relations in the mind of respondent's it is important to notify basic information regarding the aim of the study and the researcher's status and role in the study. Such action will give the respondents confidence on the ground and the importance of the study. The researcher firmly believes and has been maintained the objectivity of the study in the process of data collection, analysis of the data, and report preparation stages. This has assisted him to keep the balance and avoid bias. The researcher did not disclose any personal information of the respondents and the same has been explained during the distribution of the questionnaire.

Besides, credit was given to the authors of documents that were referred and to the appropriate person and institution whenever deemed.

CHAPTER FOUR

4. RESULTS, DISCUSSION, AND INTERPRETATION

4.1. Introduction

This chapter presents the data analysis, research findings, and discussions to research objectives and research questions stated in the first chapter of the study.

4.2. Questioner response rate

The response rate is formally defined as the number of completed questionnaires divided by the number of eligible sample members (Frohlich, 2001). Response rates are generally considered to be the most widely compared statistic for judging the quality of surveys (Johnson and Owens, 2008). There is no specific response rate that guarantees an unbiased representation of the population. As a general rule of thumb, most reviewers look for a response rate \geq of 70% (Rubinfeld, 2004). The sample size of the study was 95 employees of the WFP Ethiopia who have direct access to the downstream humanitarian supply chain management. The study involved 8 sub-offices including the head office in Addis Ababa. Among the distributed questioners by electronics means 82 questioners returned to the researcher with a response rate of 86 percent. This response rate was representative to all populations, and conforms to Powell, 2003 stipulation that a response rate of 50% is adequate for further analysis and reporting of all data; a rate which is 60% and so is good while, 70% and over is considered excellent.

Table 4.1 Response rate

Response status	Frequency	Percentage
Filled and returned	82	86
Not returned	13	14
Total	95	100

4.3. General Demographic profile of WFP Ethiopia's Respondents.

Table 4.2 Demographic profile of the respondent

Dimensions	Variables	Frequency	Percent
Gender	Male	66	80.5
	Female	16	19.5
	Total	82	100
Age	20-30	3	3.7
	31-40	29	35.4
	41-50	44	53.7
	Above 10 years	6	7.3
Educational qualification	Diploma	4	4.9
	First Degree	45	54.9
	Masters and Above	33	40.2
Position in the organization	Logistics Assistant	21	25.6
	Procurement Officer	6	7.3
	Procurement Associate	7	8.5
	Coordinator	4	4.9
	Logistic Associate	15	18.3
	National Logistic Officer	13	15.9
	International Logistic Officer	4	4.9
	Warehouse Management Ass	5	6.1
	Stock Keeper	7	8.5
Work Experience	1-3 years	2	2.4
	4-5 years	7	8.5
	6-10 years	23	28
	above 10 years	50	61
Place of Assignment	Addis Ababa	34	41.5
	Dire Dawa	6	7.3
	Nazareth	18	22
	Gamebella	3	3.7
	Gode	2	2.4
	Jijiga	13	15.9
	Kebridehar	2	2.4
	Kombolcha	3	3.7
	Mekele	1	1.2

Source: the researcher 2020

4.3.1. Respondents Gender

The gender composition of the respondents showed that the majority, 66 (80.5%) are males and 16 (19.5%) are females.

4.3.2. Respondent's age

As per the findings, 3.7 % were between 20-30 years, the majority of respondents were between 40-50 years old (53.7%), 7.3% were above 50 years old. The findings also show 35.4% of the population was between 31-40 years these groups could handle the labor-intensive logistics management works owing to their productive age.

4.3.3. Respondent's Educational Qualification

Educational Qualification of respondents as indicated in table 4.2; 4.9 % of respondents hold a diploma, 54.9% of respondents of the WFP employees holds a first degree and the rest 40.2 % of respondents hold a second Degree and above this shows that there is no problem in the area of fundamental understanding and knowledge of the subject they are working with.

4.3.4. Respondents' position in the organization

The WFP Ethiopian response of employees for the question "position in the organization" the results presented as follows.

As shown from the table majority of the respondents which are 25.6 % are Logistics Assistant, Procurement Officer 7.3% Procurement Associate 8.5%, Coordinator 4.9%, Logistic Associate 18.3%, National Logistic Officer 15.9 %, International Logistics Officer 4.9% warehouse Management Associate 6.1% and Stock Keeper about 8.5% of the sample population.

4.3.5. Work Experience

The research wanted to find out the years of experience the respondents have in the logistics management functions at WFP Ethiopia. The responses were analyzed, and the results are shown in the table.

The study findings revealed that the majority of the respondents (61 %), had a work experience of above 10 years whereas 28.0% had a work experience of between 4 to 6

years. only 8.5% had below 4 to 5 years of work experience as indicated in table 4.2. The result implies that the majority of WFP employees had served for a substantial period which enables them to give credit information relating to the study.

4.3.6. Place of Assignment

As we can see from the table 41.5 % of the respondents are from Addis Ababa, 22 % from Nazareth, and 15.9% from Jijiga.

The study findings revealed that the majority of the respondents (41.5%), is working in the head-quarter whereas 22% is working at Nazareth this implies that most of the downstream humanitarian operations performed at these two places.

4.4. Descriptive analysis of Downstream Humanitarian supply chain practices of WFP Ethiopia.

The first objective of the study was to assess the downstream humanitarian supply chain management practices of the World Food Program in Ethiopia. The question mainly focuses on DSHSCM practices these include, Transport management practices, Inventory management, procurement practice, and warehouse management practices. Likert scale with a five-point indication applied with 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree was used to rate the downstream humanitarian supply chain management practice.

Analysis of the data was done using means and standard deviations. The means recorded were interpreted as follows: 1-1.49 = Strongly Disagree; 1.5-2.49 = Disagree; 2.5-3.49 = Neutral; 3.5-4.49 = Agree; 4.5-5.0 =Strongly Agree (Lady, 2016).

Table 4.3: Summary of the Downstream Humanitarian supply chain practices of WFP

Downstream Humanitarian supply chain practices	N	Mean	Std. Dev.
Inventory Management	82	4.1854	0.70117
Transport Management	82	4.5122	0.5269
Procurement Practice	82	4.1049	0.75111

Warehouse Management	82	4.3512	0.66634
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Source: Researcher 2020

4.4.1. Transport Management Practices

The study sought to assess the downstream humanitarian supply chain transport management practices of WFP Ethiopia.

Accordingly, the study findings are shown in table 4.4 below.

Table 4.4 Transport Management Practice

Transport Management	N	Mean	Std. Dev.
WFP Ethiopia delivers relief supplies to where they are required during emergencies.	82	4.6585	.47712
WFP Ethiopia collaboratively work with sufficient transport companies that provide transportation services for emergency works.	82	4.6585	.47712
There is a pre-qualified list of transport companies for WFP Ethiopia to choose from during emergencies.	82	4.6585	.57132
WFP Ethiopia uses various transport optimization models to deliver supplies with the least cost possible.	82	4.0732	.87179
Overall	82	4.5122	.52690

Source: Researcher 2020

As shown from the above table, a mean of (M=4.5122) and standard deviation of SD = (.52699) was recorded indicating that respondents strongly agree as transport management has been properly practiced in the organization. As revealed from the table, for the question WFP Ethiopia delivers relief supplies to where they are required during emergencies the result depicts a mean and standard deviation values of (M=4.6585, SD=0.47712) followed by a question WFP Ethiopia collaboratively work with sufficient transport companies that provide transportation services for emergency works having the same mean and standard deviation i.e. (M=4.6585, SD=0.47712) like the first one. The result for the third question of whether WFP has a pre-qualified list of transport companies to choose from during emergencies shows a slightly higher standard deviation and the same mean value of (M=4.5685, SD=0.57132). For the fourth question i.e WFP Ethiopia uses various transport optimization models to deliver supplies with the least cost possible result shows varied

results with a mean and standard deviation values when compared with the last three replays i.e (M=4.0732, SD 0.08179).

The analysis also showed that the standard deviation spread from 0.47712 to 0.87179 indicating how the respondents were varied in their opinion for these particular questions.

4.4.2. Inventory Management Practice

The study attempted to discover the downstream humanitarian inventory management practices in WFP Ethiopia. The results are shown in Table 4.5

Table 4.5 Inventory Management

Inventory Management	N	Mean	Std. Dev.
WFP Ethiopia categorize its Inventory Using ABC Analysis.	82	4.0000	.94281
WFP Ethiopia optimizes its Pick and Pack Process of inventory management.	82	3.8537	.90434
WFP Ethiopia established its Inventory Management KPIs.	82	4.8049	.39873
WFP Ethiopia use an Accurate Reorder Point Formula like EOQ (Economic Order Quantity) to manage its inventory.	82	4.1585	.96186
WFP Ethiopia carry safety stock Inventory.	82	4.1098	.83157
Overall	82	4.1854	.70117

As shown from the above table, a mean of (M=4.1854) and standard deviation of SD = (.70117) was recorded indicating that most of the respondents agreed with the inventory management practice of the questioner. As revealed from the table, the statement that WFP Ethiopia established its Inventory Management KPIs was the most valued result with mean of (M= 4.8049, SD= 0.39873) indicating which was strongly agreed practice next to WFP Ethiopia use an Accurate Reorder Point Formula like EOQ (Economic Order Quantity) to manage its inventory (M= 4.1585, SD= 0.96186). WFP Ethiopia carries safety stock Inventory. (M=4.1086, SD= 0.83157), WFP Ethiopia categorizes its Inventory Using ABC Analysis (M=4.0000, SD= 0.94281). The least rated statement was WFP Ethiopia optimizes its Pick and Pack Process of inventory management with mean of (M=3.8537, SD= .90434) showing the respondents agreed with the question raised under inventory management practice.

The analysis also showed that the standard deviation spread from 0.39873 to 0.96186 indicating how the respondents were varied in their opinion for these particular questions.

The findings from the above table agree with the study of Merminod (2014) who concluded that the most effective and most efficient reply to disaster situations is made possible by careful pre-positioning of inventory and optimum allocation of resources.

4.4.3. Procurement Practice

The study sought to establish the downstream humanitarian procurement practice in WFP Ethiopia. The results are shown in Table 4.6.

Table 4.6 Procurement Practice

Procurement Practice	N	Mean	Std. Dev.
WFP Ethiopia established a governing supply chain council for its procurement.	82	3.5244	1.36287
WFP Ethiopia Properly align and staff the supply chain organization.	82	4.2683	.94345
WFP Ethiopia make technology work for procurement purpose.	82	4.3049	.55974
WFP Ethiopia established alliances with key suppliers.	82	4.3659	.85364
WFP Ethiopia engaged in collaborative strategic sourcing.	82	4.0610	.97306
Overall	82	4.1049	.75111

Source, Researcher 2020

As shown from the above table, a mean of (M=4.1049) and standard deviation of SD = (.75111) was recorded indicating that most of the respondents agreed with the questioner concerning the procurement practice of WFP Ethiopia.

As revealed from the table, the statement that WFP Ethiopia established alliances with key suppliers was the most rated question with (M= 4.3659), and (SD= 0.85364) indicating it was an agreed practice followed by WFP Ethiopia make technology work for procurement purpose (M= 4.3049, SD= 0.55974). WFP Ethiopia Properly aligns and staff the supply chain organization. (M=4.2683, SD= 0.94345), WFP Ethiopia engaged in collaborative strategic sourcing (M=4.0610, SD= 0.97306). The least rated statement was WFP Ethiopia established a governing supply chain council for its procurement with mean of (M=3.5244, SD= 1.36287) showing the respondents agreed with the question raised under procurement practices the WFP Ethiopia perform.

The analysis also showed that the standard deviation spread from 0.55974 to 1.36287 indicating how the respondents were varied in their opinion for procurement practice-related questions.

The findings from the above table agree with the study of Falasca, Zobel (2011) transparency and accountability in humanitarian Organization logistic and supply chain management procurement operations can be safeguarded through IT and standardization of the whole procurement processes.

4.4.4. Warehouse Management

The study sought to establish the downstream humanitarian warehouse management practice in WFP Ethiopia and the result then depicted in the table below.

Table 4.7 Warehouse Management

Warehouse Management	N	Mean	Std. Dev.
WFP Ethiopia's warehouse use a quality inventory management software.	82	4.6585	.57132
WFP Ethiopia's warehouse use money-saving options like wave picking and cross docking /Transshipment/ E.g. from truck to truck.	82	4.3659	.96241
WFP Ethiopia's warehouse use movable and fixed tracking options.	82	4.0244	1.09967
WFP Ethiopia's warehouse reorganizes the floor plan whenever needed.	82	4.2927	.63805
WFP Ethiopia's warehouse uses Tracking and Tracing system	82	4.4146	.80048
Overall	82	4.3512	.66634

Source, Researcher 2020

Warehouse management practice has shown a mean overall value of (M= 4.3512) and standard deviation (SD= 0.66634).

As revealed from the table, the statement WFP Ethiopia's warehouse use a quality inventory management software was highly rated with mean of (M= 4.6585) and standard deviation (SD= 0.57132) indicating that it was strongly agreed with replay by the respondents followed by WFP Ethiopia's warehouse uses Tracking and Tracing system (M= 4.4146, SD= 0.80048).WFP Ethiopia's warehouse use money-saving options like wave picking and cross-docking /Transshipment/ E.g. from the truck to truck with (M= 4.3659, SD= 0.96241), WFP Ethiopia's warehouse reorganizes the floor plan whenever needed (M=4.2927, SD= 0.63805). The least rated statement was WFP Ethiopia's

warehouse use movable and fixed tracking options (M= 4.0244, SD= 1.09967) showing it was agreed by most respondents.

The analysis also showed that the standard deviation spread from 0.57132 to 1.09967 showing how the respondents were varied in their opinion for warehouse management practice related questions.

The findings from the above table agree with the literature review that has been briefed in chapter two of the research study.

4.5. Descriptive statistical on Downstream Humanitarian Supply Chain Management Performance of WFP Ethiopia.

The second objective of the study was to examine the performance of the downstream humanitarian supply chain management at WFP Ethiopia. The respondents were asked to indicate their perception of the downstream humanitarian supply chain performance concerning cost, responsiveness, agility /flexibility/, asset management, and reliability /quality/. A five-point Likert scale with 1 = Strongly Disagreed; 2 = Disagreed; 3 =Neutral; 4 = Agreed; 5 = Strongly Agreed was used to rate the state of downstream humanitarian supply chain management performance.

Analysis of the data was done using means and standard deviations. The means recorded were interpreted as follows: 1-1.49 = Strongly Disagreed; 1.5-2.49 = Disagreed; 2.5-3.49 = Neutral; 3.5-4.49 = Agreed; 4.5-5.0 =Strongly Agreed (Lady, 2016).

4.5.1. Cost

The study sought to establish the downstream humanitarian supply chain management concerning the cost in WFP Ethiopia and the result depicted in the table below.

Table 4.8 Cost

Cost	N	Mean	Std. Dev.
WFP Ethiopia is good at managing all the costs that arise from all its activities in supplying and distributing material to where needed.	82	3.5854	.96802
WFP recognizes cost management and optimization as important issues in its operations.	82	3.9512	.79973
Costs related to damaged supplies doesn't exist in WFP Ethiopia.	82	2.4634	.91887

WFP Ethiopia applies cost cutting measures to reduce total cost in its operations. 82 3.7073 .63805

Overall 82 3.4268 .65321

Source, Researcher 2020

4.5.2. Responsiveness

The study sought to establish the downstream humanitarian supply chain management concerning responsiveness in WFP Ethiopia and the result depicted in the table below.

Table 4.9 Responsiveness

Responsiveness	N	Mean	Std. Dev.
WFP Ethiopia has an accurate system model which calculates target stocking levels	82	4.3415	.72384
WFP Ethiopia avail the right product at the right time, which reduces costly service interruptions.	82	4.1707	.91361
WFP Ethiopia optimizes inventory investment within a responsive range.	82	4.1463	.72217
Due attention is given by WFP Ethiopia and there is proper follow-up of speeds of responding to the requests at any level.	82	3.8537	.84797
Overall	82	4.1280	.64579

Source, Researcher 2020

4.5.3. Agility /Flexibility/

The third factor of the performance section tries to identify the intention of the respondents concerning agility or flexibility in the downstream humanitarian supply chain management performance.

Table 4.10 Agility

Agility	N	Mean	Std. Dev.
WFP Ethiopia have the ability to respond to external influences quickly with flexibility and adaptability.	82	3.8537	.84797
To maintain agility WFP Ethiopia use contingency planning and preposition of inventory.	82	3.6585	.78912
WFP Ethiopia have the capacity to responding to the change in market situation.	82	4.1220	.99864
Re-engendering some process by simplifying them and increasing parallel process than serious one is common in WFP Ethiopia.	82	3.4024	.66406
Overall	82	3.7591	.74788

4.5.4. Asset Management

The fourth factor of the performance section tries to identify the intention of the respondents concerning asset management in the downstream humanitarian supply chain management performance and the statistical values will be discussed in the next section.

Table 4.11 Asset Management

Asset Management	N	Mean	Std. Dev.
The supplies are stored in WFP Ethiopia's warehouse at the right quantity at any time.	82	2.7073	.89564
WFP Ethiopia's cost of carrying supplies in the warehouse is very small.	82	2.5366	.86346
Most packaging/shipping materials used by WFP Ethiopia are reusable.	82	2.3537	.85161
There is no excess inventory in WFP Ethiopia.	82	2.6463	.79150
Overall	82	2.5610	.74075

Source, Researcher 2020

4.5.5. Reliability

The fifth factor presented in the questioner was about to assess the reliability performance of WFP in the downstream humanitarian supply chain management the replay is summarized and the interpretation presented in the next section.

Table 4.12 Reliability

Reliability	N	Mean	Std. Dev.
The WFP Ethiopia's downstream supply chain is able to deliver service on-time	82	4.5122	.50293
The WFP Ethiopia's downstream supply chain is able to stock the right number of parts.	82	4.2439	.53428
The WFP Ethiopia's downstream supply chain is able to deliver promised service levels without performance suffering due to part supply delays.	82	4.5122	.50293
Overall	82	4.4228	.41919

Source: Researcher 20202

4.6. Discussion and Interpretation of downstream humanitarian supply chain performance.

The downstream humanitarian supply chain management performance was assessed using five indicators namely cost, responsiveness, agility /flexibility/, asset management, and reliability. Based on the analyzed data reliability was found to be ranked first with a mean result of (M= 4.4228; SD 0.41919) followed by responsiveness with a mean and standard deviation (M= 4.1280; SD=0.64579). Agility was ranked third while cost and asset management were ranked fourth and fifth in the row with grand means and standard deviation of (M=3.4268; SD= 0.065321) and (M= 2.5610; SD= 0.74075) respectively. The grand mean for reliability is pretty much closer to 4.5 which tells that respondents agreed to the indicator. However, the grand mean for cost and asset management shows a result to neutral and hence respondents perceive that WFP Ethiopia delivers reliable downstream humanitarian performance and also require to work on cost and asset management for improvement. The following table shows the mean scores of the indicators for downstream humanitarian supply chain performance.

Source, Researcher 2020

Table4.13 Summary Downstream Humanitarian SC Performance

	Indicator	N	Mean	Std. Dev.
Downstream Humanitarian SC Performance	Cost	82	3.4268	.65321
	Responsiveness	82	4.1280	.64579
	Agility	82	3.7591	.74788
	Asset Management	82	2.5610	.74075
	Reliability	82	4.4228	.41919

4.7. Descriptive statistics on factors affecting downstream humanitarian SC Management performance of WFP Ethiopia.

The third objective of the study was to assess factors affecting the performance of downstream humanitarian supply chain management in the case of WFP Ethiopia. The respondents were asked to indicate their perception of factors that affects downstream humanitarian supply chain performance concerning customs practice, infrastructure,

logistic quality, and tracing and tracking. A five-point Likert scale with 1 = Strongly Disagreed; 2 = Disagreed; 3 =Neutral; 4 = Agreed; 5 = Strongly Agreed was used to rate the factors under study.

Table 4.14: Summary of factors affecting DSHSCM performance of WFP

Downstream Humanitarian supply chain practices	N	Mean	Std. Dev.
Customs practice	82	3.8780	.47636
Infrastructure	82	3.9805	.70666
Logistic quality	82	3.8293	.50442
Tracing and Tracking	82	3.2561	.76070

Source: Researcher 2020

4.7.1. Customs Practice

The study sought to assess customs practice as one of the factors affecting the downstream humanitarian supply chain management performance of WFP Ethiopia.

Accordingly, the study findings are shown in table 4.15 below.

Table 4.15 Customs Practice

Customs Practice	N	Mean	Std. Dev.
The customs practices in Ethiopia increased the cost of the WFP Ethiopia’s downstream humanitarian supply chain management performance.	82	3.9512	.58589
A delay in the customs operation decreased the responsiveness of the WFP Ethiopia’s downstream humanitarian supply chain management performance.	82	4.2927	.45779
The customs practices in Ethiopia decreased flexibility (agility) of the WFP Ethiopia’s downstream humanitarian supply chain management performance.	82	4.1951	.67475
The customs practices in Ethiopia decreased the asset management performance of the WFP Ethiopia’s downstream humanitarian supply chain management.	82	3.7073	.71125
The customs practices both at Djibouti and Berbera port decreases the reliability of the	82	3.2439	.82494

WFP Ethiopia's downstream humanitarian supply chain management performance.

Overall	82	3.8780	.47636
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Source: Researcher 2020

As shown from the above table, the result revealed a mean (M=3.8780) and standard deviation of (SD= 0.47636) indicating the WFP employees was agreed with the factors customs practice affects the organization performance. It is also revealed from the table, for the statement, a delay in the customs operation decreased the responsiveness of the WFP Ethiopia's downstream humanitarian supply chain management performance was the highly selected with a mean (M= 4.2927), and standard deviation (SD= 0.45779) indicating that it was agreed by the respondents followed by the question "The customs practices in Ethiopia decreased flexibility (agility) of the WFP Ethiopia's downstream humanitarian supply chain management performance" (M= 4.1951, SD= 0.67475). The customs practices in Ethiopia increased the cost of WFP Ethiopia's downstream humanitarian supply chain management performance with (M= 3.9512, SD= 0.58589). The customs practices in Ethiopia decreased the asset management performance of WFP Ethiopia's downstream humanitarian supply chain management (M=3.7073, SD= 0.71125). The least rated statement was the customs practices both at Djibouti and Berbera port decreases the reliability of the WFP Ethiopia's downstream humanitarian supply chain management performance (M=3.2439, SD= 0.82494) showing it was a neutral response by most respondents.

The analysis also showed that the standard deviation spread from 0.45779 to 0.82494 showing how the respondents were varied in their opinion for customs practice-related questions.

4.7.2. Infrastructure

The study sought to assess infrastructure as one of the factors affecting the downstream humanitarian supply chain management performance of WFP Ethiopia. Accordingly, the study findings are shown in table 4.16 below

Table 4.16 Infrastructure

Infrastructure	N	Mean	Std. Dev.
The current road infrastructure in Ethiopia increased the cost of the WFP Ethiopia's downstream humanitarian supply chain management performance.	82	4.0000	.44444
Lack of smooth road infrastructure decreases the responsiveness of the WFP Ethiopia's performance on downstream humanitarian supply chain management.	82	4.2195	.81687
The lack of full flagged port infrastructure both at Djibouti & Berbera port decreases the flexibility (Agility) of WFP Ethiopia's downstream humanitarian supply chain management performance.	82	3.9756	1.16508
Poor IT infrastructure in Ethiopia decreased the asset management practice of the WFP Ethiopia's on downstream humanitarian supply chain management.	82	3.6585	1.05666
Road seasonality /road infrastructure/ in Ethiopia decreased the reliability of service quality of WFP Ethiopia's performance on downstream humanitarian supply chain management.	82	4.0488	.91493
Overall	82	3.9805	.70666

Source, Researcher 2020

As shown from the above table, the result revealed a total mean (M= 3.9805) and standard deviation (SD= .70666) showing the respondents were agreed that infrastructure affects the organization's performance. It is also revealed from the table, from the statement “Lack of smooth road infrastructure decreases the responsiveness of the WFP Ethiopia's performance on downstream humanitarian supply chain management” was highly chosen with a mean (M= 4.2195) and standard deviation value, (SD= .81687) showing that it was agreed by the respondents followed by “Road seasonality /road infrastructure/ in Ethiopia decreased the reliability of service quality of WFP Ethiopia's performance on downstream humanitarian supply chain management” (M= 4.0488, SD= .91493). “The current road infrastructure in Ethiopia increased the cost of the WFP Ethiopia's downstream humanitarian supply chain management performance” (M= 4.0000, SD= .44444). “The lack of full flagged port infrastructure both at Djibouti & Berbera port decreases the flexibility (Agility) of WFP Ethiopia's downstream humanitarian supply chain management performance” (M=3.9756, SD= 1.16508). The least rated statement was

“Poor IT infrastructure in Ethiopia decreased the asset management practice of the WFP Ethiopia’s on downstream humanitarian supply chain management” (M=3.6585, SD= 1.05666) showing it was an agreed response by most respondents.

The analysis also showed that the standard deviation spread from .44444 to 1.16508 indicting how the respondents were varied in their opinion for these particular research questions under infrastructure-related questions.

4.7.3. Logistic Quality

The study sought to assess logistic quality as one of the factors affecting the downstream humanitarian supply chain management performance of WFP Ethiopia. Accordingly, the study findings are shown in table 4.17 below.

Table 4.17 Logistic Quality

Logistic Quality	N	Mean	Std. Dev.
WFP Ethiopia’s cost has increased due to the absence of well-organized third party logistic providers in the downstream humanitarian supply chain management.	82	3.8049	.67475
There are limited knowledge and resources in the market that decreases the logistic quality of WFP Ethiopia’s flexibility (Agility) in the downstream humanitarian supply chain management.	82	3.9024	.53541
The poor logistic quality in Ethiopia decreases the asset management performance of the WFP Ethiopia’s in the downstream humanitarian supply chain management.	82	3.7561	.76273
The lack of logistic quality in Ethiopia decreases the reliability of the WFP Ethiopia’s downstream humanitarian supply chain management performance.	82	3.8537	.72217
Overall	82	3.8293	.50442

Source, Researcher 2020

As shown from the above table, the result revealed an overall mean and standard deviation of (M=3.8293, SD= .50442) indicating the respondents were agreed with the current logistic quality the organization enjoys and its effect on performance. It is also revealed from the table, for the statement “There are limited knowledge and resources in the market that decreases the logistic quality of WFP Ethiopia’s flexibility (Agility) in the downstream humanitarian supply chain management” was highly selected response with a mean (M=

3.9024,) and standard deviation (SD= .53541) indicating that it was agreed by the respondents followed by “The lack of logistic quality in Ethiopia decreases the reliability of the WFP Ethiopia’s downstream humanitarian supply chain management performance.” (M= 3.8537, SD= .72217). “WFP Ethiopia’s cost has increased due to the absence of well-organized third party logistic providers in the downstream humanitarian supply chain management” with a mean and standard deviation (M= 3.8049, SD= .67475). The least rated statement was “The poor logistic quality in Ethiopia decreases the asset management performance of the WFP Ethiopia’s in the downstream humanitarian supply chain management” with a mean and standard deviation (M=3.7561, SD= .76273) showing it was an agreed response by most respondents.

The analysis also showed that the standard deviation spread from .53541 to .76273 indicating how the respondents were varied in their opinion for these particular research questions under logistic quality-related questions.

4.7.4. Tracing and Tracking

The study sought to assess tracing and tracking as one of the factors affecting the downstream humanitarian supply chain management performance of WFP Ethiopia.

Accordingly, the study findings are shown in table 4.18 below.

Table 4.18 Tracing & Tracking

Tracing and Tracking	N	Mean	Std. Dev.
WFP Ethiopia’s cost of operating the technology has increased to track & track it’s consignment on real time base in the downstream humanitarian supply chain management.	82	3.3659	.90965
Week tracing & tracing technologies has decreased the responsiveness of the WFP Ethiopia’s performance on downstream humanitarian supply chain management.	82	3.3659	.90965
Week tracing & tracing technologies has decreased flexibility (agility) of the WFP downstream humanitarian supply chain management performance.	82	3.0244	.95550

The tracing & tracking technologies in Ethiopia decreased the asset management performance of the WFP Ethiopia's in the downstream humanitarian supply chain management.	82	3.2683	.62950
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Overall	82	3.2561	.76070
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Source, Researcher 2020

The result from the above table shows that a total mean (M=3.2561) and standard deviation and (SD= .76070) showing the respondents were neutral with the current tracing tracking technology and its effect on performance. Accordingly, the table revealed for the statements “WFP Ethiopia’s cost of operating the technology has increased to track & track it’s consignment on a real-time base in the downstream humanitarian supply chain management” and “Week tracing & tracking technologies has decreased the responsiveness of the WFP Ethiopia’s performance on downstream humanitarian supply chain management was relatively the most chosen replay with mean of (M= 3.3659) and standard deviation (SD= .90965) indicating neutral replay by the respondents concerning the effect of tracing and tracking on the organization downstream humanitarian supply chain performance followed by “The tracing & tracking technologies in Ethiopia decreased the asset management performance of the WFP Ethiopia’s in the downstream humanitarian supply chain management” with a mean and standard deviation (M=3.2683, SD=.62950). The least rated statement which was “Week tracing & tracking technologies has decreased flexibility (agility) of WFP downstream humanitarian supply chain management performance.” provides a mean and standard deviation (M=3.0244, SD= .95550) showing it was a neutral response by most respondents.

The analysis also showed that the standard deviation spread from .62950 to .95550 indicting how the respondents were varied in their opinion for these particular research questions under tracing and tracking related questions.

4.8. Inferential and Descriptive Analysis of WFP Ethiopia.

As stated earlier, the third objective of the study was to examine the performance of the downstream humanitarian supply chain management at WFP Ethiopia. Hence, the following correlation and regression have been done and the results discussed hereunder.

4.8.1. Correlation Analysis

This study analyzed relationships by using the correlation analysis, which investigates the strength of relationships between the dependent and independent variables. The sign of the correlation coefficient generated from the report shows whether the correlation is positive or negative and the magnitude or scale of the correlation indicates the strength of the correlation.

Concerning Pearson correlation coefficients the analysis determines intending to obtain information about the relationships that exist between the dependent and independent variables and the result presented in Table 4.19

Table 4.19 Correlation

		Correlations				
		DSHSCM Performanc e	Customs practice	Infrastructur e	Logisti c Quality	Tracing Trackin g
DSH SCM Performance	Pearson Correlation	1				
	Sig. (2- tailed)					
	N	82				
Customs practice	Pearson Correlation	-.788**	1			
	Sig. (2- tailed)	.000				
	N	82	82			
Infrastructure	Pearson Correlation	.089	.128	1		
	Sig. (2- tailed)	.429	.253			
	N	82	82	82		
Logistic Quality	Pearson Correlation	-.227*	.406**	.718**	1	
	Sig. (2- tailed)	.041	.000	.000		
	N	82	82	82	82	
Tracing Tracking	Pearson Correlation	-.175	.523**	.400**	.493**	1
	Sig. (2- tailed)	.116	.000	.000	.000	
	N	82	82	82	82	82

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

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

Source, Researcher 2020

The results indicated that there is a negative strong significant correlation between customs practice and downstream humanitarian supply chain management performance ($r=-.788$, $p<0.01$). According to, NJ. Gogtay & Thatte UM (2017), in statistics the strength and direction of a linear relationship between different variables on a scatter-plot are measured by the coefficient r . The value of r is always between -1 and 1 they explained the intervals as shown bellow

Exactly -1. A perfect downhill (negative) linear relationship

-0.70. A strong downhill (negative) linear relationship

-0.50. A moderate downhill (negative) relationship

-0.30. A weak downhill (negative) linear relationship

1. No linear relationship

+0.30. A weak uphill (positive) linear relationship

+0.50. A moderate uphill (positive) relationship

+0.70. A strong uphill (positive) linear relationship

Exactly +1. A perfect uphill (positive) linear relationship

From the above literature, we can, therefore, infer that logistic quality has -.227 Pearson correlation value with the dependent variable ($r=.0429$, $p<0.05$). The result explained as there is a negative predictable relation between the variables, and also the significant level p is less than 0.05 ($p<0.05$).

The results also showed that infrastructure has a weak uphill positively and not significantly correlated with downstream humanitarian supply chain management performance ($r=0.089$, $p>0.05$) i.e. $p= .429$.

From the results, the correlation between tracing & tracking and DSHSCM Performance showed the Pearson correlation value-.175 this implies that the magnitude is a weak downhill negative linear relationship between variables and $p>.05$ and not a significant relationship with the dependent variable.

Generally, from the correlation analysis, one can infer there is a positive, as well as negative statistically significant and not a significant relationship, observed between variables of DSHSCH performance and factors affecting DSHSCM performance of WFP Ethiopia.

4.8.2. Regression

The independent variables influence over the dependent variable is assessed by a multiple regression analysis these were (customs practice, infrastructure, logistic quality, and tracing and tracking) on the dependent variable (downstream humanitarian supply chain management performance). The overall fit of the model and relative contribution of each of the predictors to the total variance explained is also determined by multiple regression. The correct use of the multiple regression model requires several critical assumptions to be satisfied in the model and establish validity. Interpretations and generalizations of the theory are only valid and functional if the assumptions in the analysis have been tested to get satisfied Balance (2004).

4.8.3. Model Summary

From the model summary under table 4.24, the "R" column represents the value of R, and the multiple correlation coefficient. R-value of 0.845a indicates a very strong correlation between downstream humanitarian supply chain management performance and the four independent variables which shows a good level of prediction. The "R Square" called the coefficient of determination, which is the proportion of variance in the dependent variable that can be explained by the independent variables. R² value of .714 implies that 71.4% of the variation in the downstream humanitarian supply chain management performance of WFP Ethiopia can be explained by the predictors included in the model. Before carrying out multiple regression analysis, the researcher has checked the required assumptions that the data must meet to make the analysis reliable and valid. The following assumptions of multiple linear regression were tested using SPSS.

- **Assumption about linearity:** Linearity defines the dependent variable as a linear function of the independent variable (Balance, 2004). Linearity assumption was tested by producing scatterplots of the relationship between each of the independent variables and the dependent variable. By looking at the scatterplot produced by the system, the relationship between each independent variable and the dependent variable found linear as shown in Appendix C.
- **Multicollinearity assumption:** Multicollinearity is a statistical phenomenon in which there exists a perfect or exact relationship between the predictor variables.

When there is a perfect or exact relationship between the predictor variables, it is difficult to come up with reliable estimates of their coefficients. It will result in incorrect conclusions about the relationship between the outcome variable and predictor variables (Alibuhtto and Peiris, 2015). According to Reddy et al. (2013), the most widely applicable method of detecting the multicollinearity is Variance Inflation Factor (VIF) and it is very accurate in determining the problem of multicollinearity. The common thumb rule is if any of the VIF values exceed 5 or 10, it implies that the associated regression coefficients are poorly estimated because of multicollinearity.

Accordingly, collinearity diagnostics were conducted using SPSS and VIF values found less than the values stated in the rule of thumb which shows that multicollinearity was not a problem as shown in Appendix C.

- **Normality assumption:** Multiple regression assumes that variables have normal distributions. This means that errors are normally distributed and that a plot of the values of the residuals will approximate a normal curve. There are two common methods to check normality assumption these are a histogram and a Normal P-P Plot for our study both confirmed that errors were normally distributed and it is depicted in the appendices too.
- **Homoscedasticity assumption:** The assumption of homoscedasticity refers to the equal variance of errors across all levels of the independent variables. This means that errors are spread out consistently between the variables.

To assess homoscedasticity, the researcher created a scatterplot of standardized residuals versus standardized predicted values using SPSS and found that heteroscedasticity was not a major problem as shown in the appendix.

After the data was checked for the above assumptions multiple regression analysis was carried out to determine how well the regression model fits the data (model summary), independent variables statistically significantly predict the dependent variable (ANOVA), and statistical significance of each of the independent variables (regression coefficients).

Table 4.20 Model Summary

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.845 ^a	.714	.699	.18267	2.505

A. Predictors: (Constant), Tracing & Tracking, Infrastructure, Customs Practice, Logistic Quality

B. Dependent Variable: Downstream Humanitarian Supply Chain Management Performance

Source Researcher 2020

4.8.4. ANOVA Model Fit

The F-ratio in the below ANOVA table (table 4.20) tests shows that the overall regression model is a good fit for the data under study. The table also shows that the independent variables customs practice, infrastructure, logistic quality, and tracing and tracking were statistically significant to predict the dependent variable, $F = 48.036$, $p < .001$.

Table: 4.21 ANOVA Model Fit

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	6.411	4	1.603	48.036	.000 ^b
1 Residual	2.569	77	.033		
Total	8.981	81			

a. Dependent Variable: Downstream Humanitarian Supply Chain Management Performance

b. Predictors: (Constant), Tracing Tracking, Infrastructure, customs practice, Logistic Quality

4.8.5. Regression Coefficient

Table 4:22 Regression Coefficient

Coefficients ^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.706	.200		28.524	.000
	Customs practice	-.637	.054	-.912	-11.857	.000
	Infrastructure	.086	.044	.183	1.982	.051
	Logistic Quality	-.089	.065	-.134	-1.357	.179
	Tracing & Tracking	.129	.034	.295	3.771	.000

a. Dependent Variable: Downstream Humanitarian Supply Chain Management Performance

Source; Researcher 2020

4.8.5.1. Standardized Coefficients

The standardized coefficients are used in the comparison of the impact of any independent variable on the dependent variable. The higher the absolute value of the beta coefficient, the stronger the effect. As indicated in the regression coefficients table (table 4.27), customs practice had the highest standardized coefficient (-.912) followed by tracing and tracking (.295). This revealed that customs practice had a higher relative effect on downstream humanitarian supply chain performance. Infrastructure and logistic quality stood third and fourth in their relative importance.

As can be seen from the regression coefficient table, the predictor variables of customs practices and tracing and tracking are statistically significant in predicting downstream humanitarian supply chain performance because both their p-values are less than the alpha level of 0.05. However, the p-value for infrastructure (0.051) and logistic quality (0.179) is greater than the alpha level of 0.05, showing the results are not statistically significant.

4.8.5.2. Unstandardized Coefficients

The unstandardized coefficient denotes the change in the dependent variable with a unit change in the independent variable. But they are not comparable in terms of impact on the dependent variable.

As stated in chapter three, the study used the following multiple regression model to establish the statistical significance of the independent variables on the dependent variable.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$$

Where; Y = Downstream Humanitarian Supply Chain Management Performance

X1 = Customs Practice

X2 = Infrastructure

X3 = Logistic Quality

X4 = Tracing and tracking

In the model, β_0 = Constant, β_1 to β_4 = Regression coefficients represent the mean change in the dependent variable for one unit of change in the independent variable while holding independent variables in the model constant and ϵ = Error term which captures the unexplained variation in the model.

$$Y = 5.706 + (-.637X_1) + .086X_2 + (-.089) X_3 + .129X_4 + \epsilon$$

The constant value ($\beta_0 = 5.706$) shows that downstream humanitarian supply chain management performance of WFP Ethiopia would be 5.706 if other variables of the model were zero. Similarly, a beta coefficient of -.637 indicates that a unit change in customs practice leads to a change in the downstream humanitarian supply chain management performance of WFP Ethiopia by -.637. Besides, the Error term (ϵ) estimate was assumed to be zero.

Regression coefficient results show that two out of the four variables are statistically significant in predicting the downstream humanitarian supply chain performance of WFP.

Table 4.23 Summary of the overall output of the research hypotheses

	Hypotheses	Result	Reasons
H1	Customs clearance practice has significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.	H1 Accepted	P<0.05
H2	Infrastructure (Quality of trade & transport related infrastructure) has significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management Performance.	H2 Rejected	P>0.05
H3	Logistics quality (competence and quality of logistics services) has significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.	H3 Rejected	P>0.05
H4	Tracking and Tracing (ability to track and trace consignment) has significant effect on the WFP Ethiopia Downstream Humanitarian Supply Chain Management performance.	H4 Accepted	P<0.05

Source Researcher 2020

CHAPTER FIVE

5. SUMMARY, CONCLUSION, AND RECOMMENDATION

5.1. Introduction

The study tries to assess the practices, and factors affecting downstream humanitarian supply chain management performance in the case of WFP Ethiopia. The three objectives of the study were to assess the downstream humanitarian supply chain management practices of the WFP Ethiopia, to examine the performance of the downstream humanitarian supply chain management and to assess factors affecting the performance of downstream humanitarian supply chain management in the case of WFP Ethiopia. This chapter provides a summary of findings, conclusions, and recommendations. Limitations of the study and suggestions for future studies also incorporated.

5.2. Summary of Findings

The study was an attempt to cover the practices, and factors affecting downstream humanitarian supply chain management performance in the case of WFP Ethiopia by looking at customs practice, infrastructure, logistic quality, and tracking and tracing as an external factor that affects the performance of downstream humanitarian supply chain management of WFP Ethiopia. The study was also attempted to assess the downstream humanitarian supply chain practices of WFP Ethiopia by looking at the transport management practice, inventory management, procurement practice, and warehouse management of WFP Ethiopia. The study tried to explore important concepts regarding the research objective. It included a review of related literature regarding history and advancement of logistics, logistics management practices, challenges of supply chain management, downstream humanitarian supply chain performance as well as theoretical and empirical literature reviews concerning the study.

Data for the study was obtained through an electronic method by mailing to a pre-determined sample of employees of the organization. A total of 95 questionnaires were delivered to respondents and 82 were returned with a response rate of 86%. An overall value of Cronbach alpha ($\alpha = 0.89$) indicated and the overall internal consistency test of research instruments was found in the “acceptable” reliability range.

Concerning the general information of respondents, 80.5% of them were male and 19.5% were female. While 54.9% of the respondents had a first degree, 40.2% had a second degree and 4.9 of them had a diploma, in general, their level of education shows that there are a few knowledge gaps to deliver logistic operations. Besides, 61% of respondents had work experience of above 10 years, 28 % had work experience between 6-10 years, 8.5% of them had below 4-5 years of work experience and 2.4% had 1-3 years of experience. From this one can conclude that most of the respondents have worked for more than ten years and they are assumed to have a knowledge of expertise in humanitarian operations.

About the place of assignment, 41.5% of them work at Addis Ababa, 22% Nazareth, 15.9% of the respondent's work at Jijiga sub-office, and 7.3% at Dire Dawa sub-office the rest sub-office account only 15% of the respondents. This shows that most of the respondents are working in an area where there is a well-organized working environment in both physical and virtual settings.

The first objective of the study was to assess the downstream humanitarian supply chain management practices of WFP Ethiopia. As per the descriptive statistical analysis, the result from the research study indicates transport management practice has an overall mean and standard deviation value of (M=4.5122, SD= .52690) and this explains it is the most practiced downstream humanitarian supply chain practice in WFP Ethiopia followed by warehouse management practice (M=4.3512, SD= .66634). Inventory management was practiced next to warehouse management with mean and standard deviation values of (M=4.1854, SD= .70117). Procurement practice was relatively the least downstream humanitarian supply chain management practice among all other factors with a mean and standard deviation of (M=4.1049, SD= .75111).

In general, from the DSHSCM practices transportation management is the only, strongly agreed practice however, inventory management, warehouse management, and procurement practice were an agreed practice at the WFP Ethiopia as per the research result.

The second objective of the study was to examine the performance of the downstream humanitarian supply chain management at WFP Ethiopia. The descriptive analysis result indicates WFP Ethiopia provides reliable service with reliability overall mean and standard deviation value (M=4.4228, SD= .41919) followed by responsiveness with mean and

standard deviation of (M=4.1280, SD .64579). Agility and cost comes next to responsiveness with respective mean and standard deviation values of (M=3.7591, SD=.74788) and (M= 3.4268, SD= .65321) respectively. However, asset management is the least performance with a mean and standard deviation of (M= 2.5610, SD= .74074).

Hence, the study concluded that for performance measure questions for reliability, responsiveness, and agility in the WFP Ethiopian the respondents were agreed with the practice however, for questions related to cost and asset management they were neutral since the scale of the respondents fall between 2.5- 3.49. However, asset management and cost are the least among the performance measures with an overall mean value of 2.5610 & 3.4248 respectively. This harmed the performance of the organization to a greater extent in delivering its operation in the downstream humanitarian operation. The result implies that the respondents are neutral in their perception.

Moreover, Pearson correlation coefficients were determined to obtain information about the relationships between the dependent (downstream humanitarian supply chain management performance) and independent variables (factors affecting downstream humanitarian supply chain management). About the relationship between independent variables and dependent variable, the study concluded that

There is a negative and strong relationship between customs practices and DSHSCMP. However, infrastructure shows positive very weak relation to the performance of WFP Ethiopia. Logistic quality produces a negative weak relation with the r-value of -.227 and on the other hand tracing and tracking shows a negative very weak relationship with DSHSCMP.

Multiple regression analysis was used to determine whether the independent variables will influence the dependent variable. R square value from the regression model summary ($R^2 = .714$) indicated that 71.4% of the variation in the downstream humanitarian supply chain management performance of the WFP Ethiopia can be explained by the independent variables included in the model.

The ANOVA test result revealed that the independent variables statistically and significantly predict the dependent variable ($F = 48.036$, $p < .001$). The regression analysis results further revealed that the independent variable's customs practices, and tracing and tracking are statistically significant in predicting downstream humanitarian supply chain

management performance because their p-values are less than alpha level of 0.05. However, the p-value for infrastructure and logistic quality is greater than alpha level of 0.05 which implies that they are not statistically significant in predicting the downstream humanitarian supply chain management performance despite literature has outlined them as important factors that determine supply chain performance the study shows that they are not properly addressed in the WFP Ethiopia.

To put it in a nutshell the independent variables customs practices and tracing & tracking had predicting power on the downstream humanitarian supply chain management performance of the WFP Ethiopia. But infrastructure and logistic quality have shown a non-significant effect on the performance of the WFP Ethiopia with a significant value of > 0.05

5.3. Conclusions

Conclusion drawn based on the findings presented in previous sections, the research has drawn the following conclusions. From the descriptive statistical analysis result regarding the downstream humanitarian supply chain management practices in WFP Ethiopia, the research concludes that

- The downstream humanitarian supply chain practices (transportation management, inventory management, and warehouse management) were strongly agreed practice however, procurement practice was an agreed practice by the respondents.
- Besides, the study concluded the performance measure questions for reliability, responsiveness, and agility in the WFP Ethiopian the respondents were agreed with the practice however for questions related to cost and asset management they were neutral since the scale of the respondents fall between 2.5- 3.49.

With regard to the relationship between independent variables (customs practice, infrastructure, logistic quality, and tracing and tracking) and dependent variable (cost, responsiveness, agility, asset management and reliability), the study concluded that

- There is a negative and significant relationship between customs practices and downstream humanitarian supply chain management performance of WFP Ethiopia. However, infrastructure & tracing and tracking were not significant to the performance of WFP Ethiopia.

In relation to the predicting power of independent variables, the study concluded that

- The independent variables of customs practices and tracing & tracking had predicting power on the downstream humanitarian supply chain management performance of WFP Ethiopia. But infrastructure and logistic quality did not affect the organizational performance of WFP Ethiopia.

5.4. Recommendations

Based on the findings obtained in chapter four the following recommendations are assumed to be taken so that better result is supposed to be found.

Among the downstream humanitarian supply chain management practices, transportation management is the only, strongly agreed practice. However, inventory management, warehouse management and procurement practice were an agreed practice at WFP Ethiopia as per the research result.

- Hence, to improve these values from an agreed positing to strongly agreed position WFP Ethiopia should give priority for inventory management, warehouse management, and procurement practice so that the downstream humanitarian supply chain practices will be improved to the strongly agreed position.
- Furthermore, WFP Ethiopia, has to improve its procurement practices so that it enables to properly align and staff the supply chain organization.
- With regard to asset management and cost on the downstream humanitarian supply chain management performance the organization has to do more to improve its performance on these two parameters.
- Asset management has scored the least values and care has to be given in the area of asset management practice of the organization to improve the downstream humanitarian supply chain management performance.
- WFP Ethiopia also needs to assist third parties logistic providers both in material and training to improve the logistic quality of the downstream humanitarian supply chain management control system to be cost-effective and responsive to during humanitarian operation.

5.5. Limitations and suggestions for future research

There are limitations in this study that are left for future research. Firstly, the study focused on four factors that affect the downstream humanitarian supply chain management performance namely customs practice, infrastructure, logistic quality, and tracing and tracking which are amongst the six factors that determine the logistic performance index of a given country as per the world bank study by adapting the factors to the downstream humanitarian supply chain management of WFP Ethiopia. But the study did not include possible other factors that affect the downstream humanitarian supply chain management performance and hence it suggests conducting further studies considering several other factors.

Secondly, the study only focused on the downstream humanitarian supply chain management performance of WFP Ethiopia. Similar studies should be conducted on different sectors other than a humanitarian organization for comparing the downstream supply chain management performance between different sectors.

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6. APPENDIXES

Appendix A: Questionnaire

Addis Ababa University School of Commerce

Department of Logistics and Supply Chain Management

Questionnaire to be filled by WFP Ethiopian Employees

Dear respondents,

I am a Master's degree student at the Addis Ababa University, School of Commerce in the Department of Logistics and Supply Chain Management. To complete my master's degree, I'm conducting a research titled "Assessment of Practices and Factors Affecting Downstream Humanitarian Supply Chain Management Performance: The case of World Food Program Ethiopia". The aim of this questionnaire is to collect the required data for the research that I am conducting on your organization. Thus, to accomplish this study, your cooperation is very important in giving the required information. Therefore, your genuine response is vital for the success of the study. You do not need to write your names. The information you provide will be used only for research purpose and will be kept confidential. I would like to thank you in advance for your cooperation.

Please attempt to answer all questions and make a tick mark (✓) on only one box that best explains your opinion for each statement.

If you have any questions, please contact me by my email address addissina2000@yahoo.com or cell phone - 0911614031.

I thank you very much in advance for your precious time.

Regards,

Asamenew G/Hana

Part I: Participants' background information

Instruction: Please check in the box that you think is most representing.

1 Gender: Male Female

2 Age: 20 – 30 31-40 41-50 Above 50

3 Educational qualification

Diploma First degree (BSc, BA) Master's degree above

Other: Please specify _____

4 Level of your position?

Logistic Assistant Procurement Officer Procurement Associate

Coordinator Logistic Associate National Logistic Officer

Procurement Associate International Logistic Officer

Warehouse Management Associate Stock keeper

5 Total work experience in supply chain management?

1 -3 Years 4-5 Years 6-10 years above 10 years

6 Place of Assignment?

Addis Ababa Dire Dawa Nazareth Gamebella Gode Jijiga

Kebridehar Kombolcha Mekele

Part II: Questions to assess performance of Downstream Humanitarian Supply Chain Management

Please indicate your level of agreement by putting the tick mark (✓) on the appropriate cell that best describes your opinion.

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

No.	Item Description	Scale				
		1	2	3	4	5
I.	Humanitarian Downstream Supply Chain Management Practices					
	A. Transport Management					
1	WFP Ethiopia delivers relief supplies to where they are required during emergencies.					
2	WFP Ethiopia collaboratively work with sufficient transport companies that provide transportation services for emergency works.					
3	There is a pre-qualified list of transport companies for WFP Ethiopia to choose from during emergencies.					
4	WFP Ethiopia uses various transport optimization models to deliver supplies with the least cost possible.					
	B. Inventory Management					
1	WFP Ethiopia categorize its Inventory Using ABC Analysis.					
2	WFP Ethiopia optimizes its Pick and Pack Process of inventory management.					
3	WFP Ethiopia established its Inventory Management KPIs.					
4	WFP Ethiopia use an Accurate Reorder Point Formula like EOQ (Economic Order Quantity) to manage its inventory.					
5	WFP Ethiopia carry safety stock Inventory.					
	C. Procurement Practice					
1	WFP Ethiopia established a governing supply chain council for its procurement.					
2	WFP Ethiopia Properly align and staff the supply chain organization.					
3	WFP Ethiopia makes technology work for procurement purpose.					
4	WFP Ethiopia established alliances with key suppliers.					
5	WFP Ethiopia engaged in collaborative strategic sourcing.					
	D. Warehouse Management					
1	WFP Ethiopia's warehouse uses quality inventory management software.					
2	WFP Ethiopia's warehouse use money-saving options like wave picking and cross docking /Transshipment/ E.g. from truck to truck.					

3	WFP Ethiopia's warehouse use movable and fixed tracking options.					
4	WFP Ethiopia's warehouse reorganizes the floor plan whenever needed.					
5	WFP Ethiopia's warehouse uses Tracking and Tracing system					
II. Factors Affecting Downstream Humanitarian Supply Chain Management Performance.						
A. Customs Practice						
1	The customs practices in Ethiopia increased the cost of the WFP Ethiopia's downstream humanitarian supply chain management performance.					
2	A delay in the customs operation decreased the responsiveness of the WFP Ethiopia's downstream humanitarian supply chain management performance.					
3	The customs practices in Ethiopia decreased flexibility (agility) of the WFP Ethiopia's downstream humanitarian supply chain management performance.					
4	The customs practices in Ethiopia decreased the asset management performance of the WFP Ethiopia's downstream humanitarian supply chain management.					
5	The customs practices both at Djibouti and Berbera port decreases the reliability of the WFP Ethiopia's downstream humanitarian supply chain management performance.					
B. Infrastructure						
1	The current road infrastructure in Ethiopia increased the cost of the WFP Ethiopia's downstream humanitarian supply chain management performance.					
2	Lack of smooth road infrastructure decreases the responsiveness of the WFP Ethiopia's performance on downstream humanitarian supply chain management.					
3	The lack of full-flagged port infrastructure both at Djibouti & Berbera port decreases the flexibility (Agility) of WFP Ethiopia's downstream					

	humanitarian supply chain management performance.					
4	Poor IT infrastructure in Ethiopia decreased the asset management practice of the WFP Ethiopia's on downstream humanitarian supply chain management.					
5	Road seasonality /road infrastructure/ in Ethiopia decreased the reliability of service quality of WFP Ethiopia's performance on downstream humanitarian supply chain management.					
	C. Logistics quality					
1	WFP Ethiopia's cost has increased due to the absence of well-organized third party logistic providers in the downstream humanitarian supply chain management.					
2	There are limited knowledge and resources in the market that decreases the logistic quality of WFP Ethiopia's flexibility (Agility) in the downstream humanitarian supply chain management.					
3	The poor logistic quality in Ethiopia decreases the asset management performance of the WFP Ethiopia's in the downstream humanitarian supply chain management.					
4	The lack of logistic quality in Ethiopia decreases the reliability of the WFP Ethiopia's downstream humanitarian supply chain management performance.					
	D. Tracing & Tracing					
1	WFP Ethiopia's cost of operating the technology has increased to track & track it's consignment on real time base in the downstream humanitarian supply chain management.					
2	Week tracing & tracing technologies has decreased the responsiveness of the WFP Ethiopia's performance on downstream humanitarian supply chain management.					
3	Week tracing & tracing technologies has decreased flexibility (agility) of the WFP downstream humanitarian supply chain management performance.					

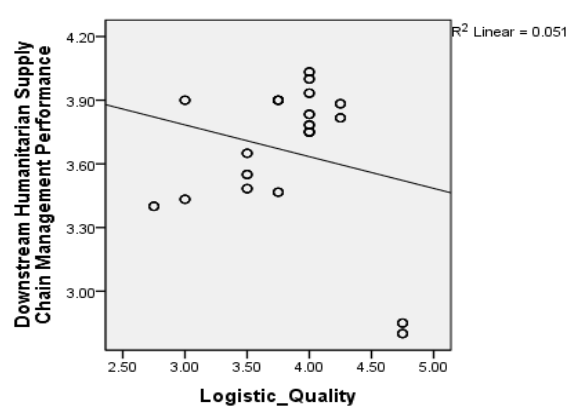
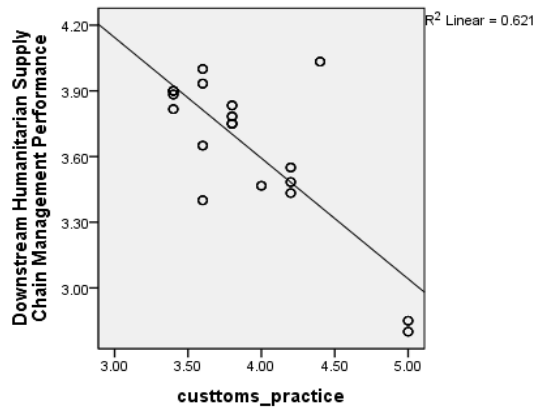
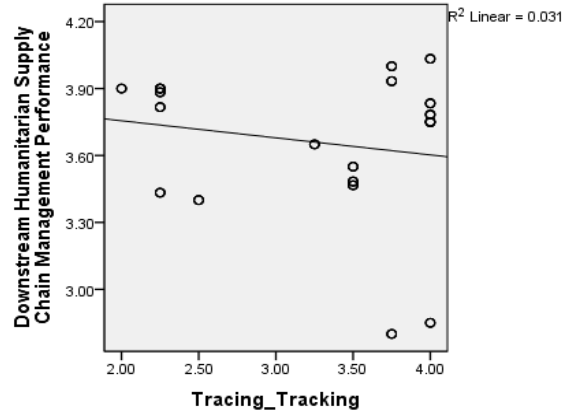
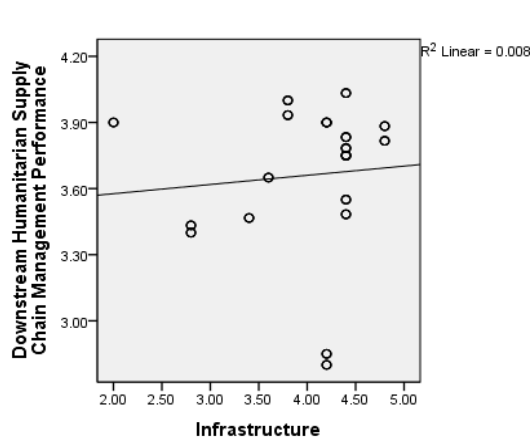
4	The tracing & tracing technologies in Ethiopia decreased the asset management performance of the WFP Ethiopia's in the downstream humanitarian supply chain management.					
III. Humanitarian Supply Chain Performance with respect to						
A. Cost						
1	WFP Ethiopia is good at managing all the costs that arise from all its activities in supplying and distributing material to where needed.					
2	WFP recognizes cost management and optimization as important issues in its operations.					
3	Costs related to damaged supplies does not exist in WFP Ethiopia.					
4	WFP Ethiopia applies cost-cutting measures to reduce total cost in its operations.					
B. Responsiveness						
1	WFP Ethiopia has an accurate system model which calculates target stocking levels					
2	WFP Ethiopia avail the right product at the right time, which reduces costly service interruptions.					
3	WFP Ethiopia optimizes inventory investment within a responsive.					
4	Due attention is given by WFP Ethiopia and there is proper follow-up of speeds of responding to the requests at any level.					
C. Agility /Flexibility/						
1	WFP Ethiopia have the ability to respond to external influences quickly with flexibility and adaptability.					
2	To maintain agility WFP Ethiopia use contingency planning and preposition of inventory.					
3	WFP Ethiopia have the capacity to responding to the change in market situation.					
4	Re-engendering some process by simplifying them and increasing parallel process than serious one is common in WFP Ethiopia.					
D. Asset Management						

1	The supplies are stored in WFP Ethiopia's warehouse at the right quantity at any time.					
2	WFP Ethiopia's cost of carrying supplies in the warehouse is very small.					
3	Most packaging/shipping materials used by WFP Ethiopia are reusable.					
4	There is no excess inventory in WFP Ethiopia					
E. Reliability (Quality)						
1	The WFP Ethiopia's downstream supply chain is able to deliver service on-time					
2	The WFP Ethiopia's downstream supply chain is able to stock the right number of parts.					
3	The WFP Ethiopia's downstream supply chain is able to deliver promised service levels without performance suffering due to part supply delays.					

Thank you so much for your time

Appendix B: Linear Regression Assumptions

1. Linearity of relationship test



2. Multicollinearity Test Result

Coefficients ^a

Model		Collinearity Statistics	
		Tolerance	VIF
1	Customs Practice	0.628	1.592
	Infrastructure	0.434	2.304
	Logistic Quality	0.380	2.635
	Tracing and Tracking	0.605	1.652

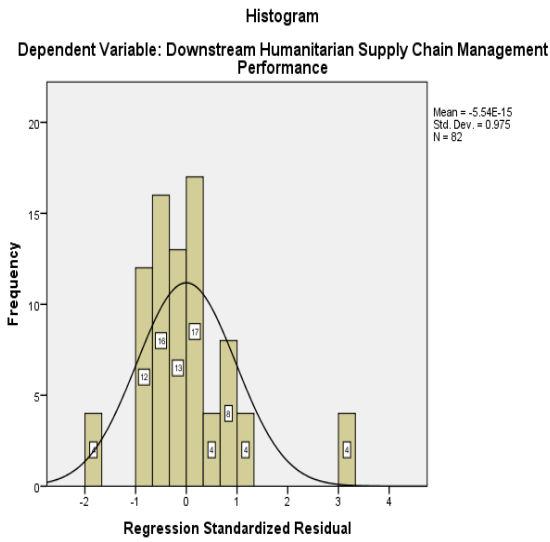
a. Dependent Variable: Downstream Humanitarian Supply Chain Management Performance

Collinearity Diagnostics ^a

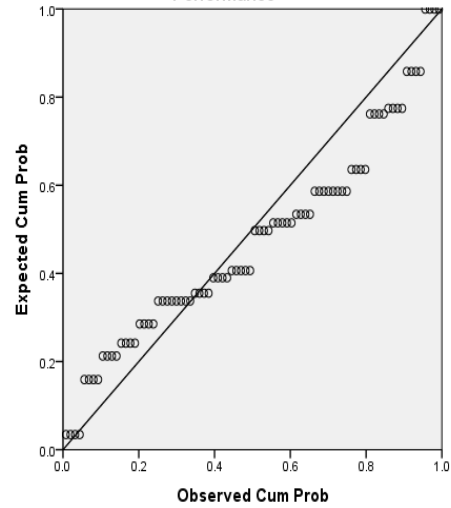
Model	Dimensions	Eigenvalue	Condition Index	Variance Proportions				
				(Constant)	customs practice	Infrastructure	Logistic Quality	Tracing Tracking
1	1	4.937	1.000	.00	.00	.00	.00	.00
	2	.030	12.757	.04	.00	.04	.01	.76
	3	.022	15.016	.07	.14	.29	.01	.02
	4	.006	28.367	.82	.36	.01	.23	.18
	5	.004	33.691	.06	.50	.66	.75	.03

a. Dependent Variable: Downstream Humanitarian Supply Chain Management Performance

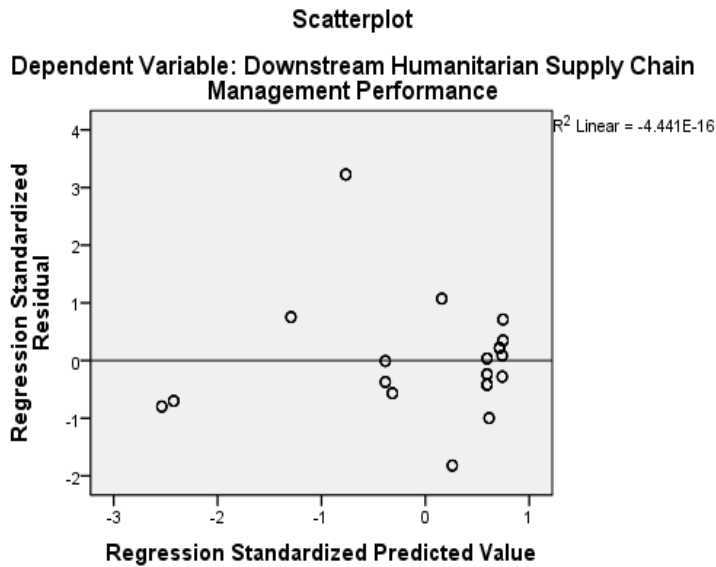
3. Normality Test



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: Downstream Humanitarian Supply Chain Management Performance



4. Homoscedasticity Test



Appendix: C

Consent Form

Dear Participants,

My name is Asamenew Geberehana; I am a student at Addis Ababa University School of Commerce, undertaking a Master's degree in logistics and Supply chain management. One of the requirements for the degree is to conduct a research project. This letter serves to ask consent from you to take part in this research. The purpose of the research is an assessment of the practices, and factors affecting downstream humanitarian supply chain management performance the case of the WFP Ethiopia.

This will be a critical input for organizations and stakeholders involved in the downstream humanitarian supply chain management. Your participation in this research is voluntary. If you decide not to participate there will be no negative consequences for you. If you do decide to participate there will be no benefits for you. However, your participation in this study is very important for the achievement of the study and for paving downstream humanitarian supply chain performance. There is no risk that is going to occur to you because of your participation in this study. All the responses given by you and the results obtained will be kept confidential using the coding system whereby no one will have access to your response. You are not expected to give your name or phone number. Without permission from you and the legal body, any part of this study will not be disclosed to the third person.

Name of investigator: Asamenew Geberehana

Name of advisors: Shifraw Miteku (Ph.D)

Thanks!!