



**HUMANITARIAN SUPPLY CHAIN PERFORMANCE OF AMREF
HEALTH AFRICA IN ETHIOPIA**

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

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**June, 2019
ADDIS ABABA, ETHIOPIA**



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Humanitarian Supply Chain Performance of Amref Health Africa in Ethiopia

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Declaration

I, Molalign Mekonnen declare that this research project “**Humanitarian Supply Chain Performance of Amref Health Africa in Ethiopia**” is my original work and has never been submitted to any other university for examination or award of a degree, and that all sources of materials used for the study have been duly acknowledged.

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Statement of certification

This research, entitled “*Humanitarian Supply Chain Performance of Amref Health Africa in Ethiopia*” was carried out by **Molalign Mekonnen Tiku** so as to obtain his Master’s degree from Addis Ababa University School of commerce. He conducted his original thesis under my guidance and supervision. I certify that, the study is his own original work and suitable for submission of the award of MA in Logistics and supply chain Management.

Advisor: Shiferaw Mitiku (PhD.)

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Acknowledgement

First of all I praise God for giving me the strength to undertake and complete the thesis. I am exceptionally grateful to my advisor Shiferaw Mitiku (PhD.) for his uninterrupted support, thorough follow-up and critical inputs on the various stages of preparing this thesis. His availability, insightful observations, professional advice and critical guidance remarks greatly enriched this paper and without him this paper might not be like this.

I would like also to extend my thanks to all Amref staffs who participated by responding the questioner and those who helped me in advising and provided me with necessary information and other reading materials as well as for showing sympathy to my endeavors. I would also like to thank my wife Haregewoin Fantahun for giving me the encouragement and her tireless support to successfully accomplish this course.

Finally, I offer my regards to all of those who supported me in any respect during my study.

The Researcher

Abstract

The objective of this thesis is to assess the supply chain performance of Amref health Africa in Ethiopia. Humanitarian supply chain is a backbone of any humanitarian program achievement and play a vital role in interpretation of their plan into actions by delivering goods and services for the needy. And, to ensure the sustainability of the supply chain service provision measuring its performance is inevitable. Among many researches that has been done in relation with assessing of the supply chain performance management most of them focused on commercial SC instead of Humanitarian supply chain management. Therefore, this research deals with a humanitarian SC performance of Amref health Africa in Ethiopia one of a humanitarian development aid organization. The study employed descriptive and explanatory quantitative research methodology, 124 respondents selected out of the total population using census method and data was collected through structured questionnaire and was analyzed using SPSS version 22.00 through application of descriptive statistics. The pilot discussion carried out prior to the study with the respected SC officers helped the researcher to decide and select the supply chain drivers which specifically implemented by Amref. And based on this the researcher identified procurement, warehouse, fleet /Transport/ and Information & communication as the major supply chain drivers. Next to this examined the supply chain performance of the organization by aligning each SC driver against the three supply chain performance indicators; reliability, flexibility and responsiveness. Then try to identify internal and external supply chain factors that affects the supply chain performance of Amref. And also analyzed the performance assessment by combining with internal & external factors and also their effects on the performance. Finally, this study has come up with result of performance indicators, major findings related with the internal and external factors and their effects on the supply chain performance: for the supply chain performance indicators flexibility, reliability and responsiveness has scored from top to bottom and for the internal & external factors; infrastructural factor, socio-economic, governmental and organizational internal factors. The study recommended solutions for the mitigation and minimization of an internal and external factors in a way they can contribute for the improvement of reliability, flexibility and responsiveness of the total supply chain performance.

Key Words: Supply chain performance, Reliability, Flexibility and Responsiveness

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List of Acronyms and Abbreviation

AHAE-Amref Health Africa

AHAE-Amref Health Africa in Ethiopia

ARM- Annual Review Meeting

GCEO- Group Chief Executive Officer

GHA- Global Humanitarian Assistance

HL-Humanitarian Logistics

HSC -Humanitarian Supply Chain

HSCM -Humanitarian Supply Chain Management

IB- International Board

ICT- Information Communication Technology

IP-Implementing Partners

NGO- Non-Governmental Organization

INGO- International Non-Governmental Organization

SC- Supply Chain

SCM- Supply Chain Management

SD- Standard Deviation

SPSS- Statistical Package for the Social Science

UNWFP- United Nation World Food Program

CHAPTER ONE

1. INTRODUCTION

This thesis deals with the measurements of Supply chain performance and its impact in humanitarian organization. How much is the impact of each key activities of the chain and their integrated result on the success of the organization examined in this thesis. The focus in the thesis is on a single organization, Amref health Africa in Ethiopia. To address this, this chapter briefly discussed about background of the study and background of the researched organization. Moreover, under the sub topics of statement of the problem, research questions and objectives, significance of the study and scope of the study, it raises the problem of concern that the study attempts to address and then goes on stating what the study is looking to achieve and its importance for the individual researcher and anyone interested on the subject matter. And in the final sub topics it discusses delimitation of the study, definition of key terms, and organization of the study.

1.1 Background of the Study

According to Blecken (2010) 55 percent of all humanitarian organizations do not monitor any form of performance indicators for their supply chain, while 25 percent only use a few performance indicators. Merely 20 percent of all humanitarian organizations consistently measure the performance of their supply chains.

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

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

So, improvements of the supply chain efficiency will have a major impacts on the performance of the organization. Hence, to major the impacts it is better to unpack the activities of the Supply chain in the context of Amref.

1.2 1.1 Background of the Organization (Amref Health Africa)

Founded in 1957, Amref Health Africa continues to carry the mantle that the founding fathers Michael Wood, Archibald McIndoe and Tom Rees, handed down; using the tools of our time (Airplane, telephone, radio, internet, and mobile phones) to link communities to their health services.

Headquartered in Nairobi, Kenya, Amref Health Africa is today the largest Africa-based international health development organization with program offices in Ethiopia, Kenya, Malawi, Mozambique, Tanzania, Uganda, Senegal, South Africa, South Sudan, and Zambia, and program development, fundraising, partnership, advocacy, monitoring and evaluation, and communication offices in Austria, Canada, France, Germany, Italy, Monaco, Spain, Sweden, The Netherlands, United Kingdom, and United States of America. In 2014 the organization rebranded from African Medical and Research Foundation (AMREF) to Amref Health Africa.

Amref Health Africa is governed by an International Board (IB) of Directors drawn from Africa, Europe and North America. The IB provides policy guidance, financial oversight, strategic orientation and fundraising leadership to the organization. Reporting to the IB is the Group Chief Executive Officer (GCEO) who leads a Corporate Senior Management Team. In Africa, the Country Directors, with the guidance of country level Advisory Council/Board take direct responsibility over the technical and financial performance of the programs under their remit. The offices in Europe and North America are led by Chief Executive Officers (CEOs)/Executive Directors (EDs) and are responsible for joint program development, fundraising, partnership,

advocacy, monitoring and evaluation, and communication. The Country Directors, CEOs/Executive Directors and Corporate Directors all report to the Group CEO.

At the conclusion of the 10-year period, an evaluation was conducted that demonstrated that overall, the Strategy directly transformed the health of approximately 12 million people annually (32 percent women and 30 percent children), directly and indirectly impacting over 70 million people through training, provision of improved health services and policy change including training of more than 700,000 health care workers in Africa.

Hence, for the achievement of these objectives through its different programmatic activities by supplying goods and services requested by project offices for the use of their respective program implementation and also for the direct use of the beneficiaries the organization carry out the work through its units that has a responsibility of managing supply chain activities.

1.3 Statement of the Problem

Assessing the supply chain performance of an organization, especially in the humanitarian sector is the most important topic for developing and implementing a successful humanitarian supply chain strategy. The various processes of the supply chain management has been studied in academic and practical papers and recently attention increasing to study the performance, design, and analysis of the supply chain as a whole (Beamon, 1998).

Logistics is the most important element in any disaster relief effort, and it is the one that makes the difference between a successful and a failed operation (Wassenhove V., 2006). It is also the most expensive part of any disaster relief and has been estimated that accounts for about 80 % of the total costs in disaster relief (Wassenhove V., 2006) and this makes logistics the most expensive part of the operation, hence measuring the supply chain performance of the organization is a vital point for any organization.

However, performance improvement is addressed by some studies and very little is relevant in the HL context (Beamon, B.; Balcik, B. 2008), (Gammelgaard, B.; Larson, P.D.2001) & (Davidson, A. 2013). For HL it is a key challenge to measure humanitarian supply chain performance and it is compounded by the difficulty in obtaining accurate data, limited information technology, a chaotic environment, lesser motivation, potentially negative media exposure, human resource issues, general reluctance, the conflict between long term and short term goals and a lack of internal recognition of the supply chain (Abidi, H., Klumpp, M., de Leeuw S., 2014).

In Amref health Africa the supply chain management flow is starting from developing a procurement plan based on the project activity plan, then identification of procurement need by the requesting units (mostly project offices) by assessing beneficiaries need, then procurement of the goods and services by procurement unit and finally material handling and transportation activities done by Admin unit at country office and at field office team to distribute to the final beneficiaries.

As per the annual review meeting of Amref report of 2016 & 2017 a number of supply chain activities has been identified as a major challenge and a reason for the inefficiency of the organization performance and due to this facts it needs a research intervention. Among the identified problems in the ARM report of the two consecutive years; a) shortage of usable organization vehicles which resulted in high project implementation cost and sluggish performance, b) Absence of updated preferred vendors list for almost for the frequently procured goods and services lead to procurement delay and compromises quality, c) procurement decisions made on the basis of least price compromises quality, d) lack of regular update of organizations fixed assets, poor store design, management and control, e) poor management of storage at field office, f) poor procurement plan; untimely, low quality, unclear procurement plan, g) undesirable quality of material due to poor specification in procurement plan, h) limited field level procurement and capacity, i) lack of timely delivering purchased items to the beneficiary, j) unavailability of distribution plan, k) delays from field offices in providing goods receiving note and l) poor contract management are the major one.

Furthermore, based on the pilot interview made with different workers as a preliminary assessment, the researcher understood that there are also additional external and internal factors affecting the supply chain performance like; unavailability of updated procurement policy, lack of proactive and thoughtful beneficiary need assessment, poor resource integration and limited collaboration between units and projects in aligning their activities, bureaucratic and delayed customs clearing process, are among the key factors and a reason for major gaps on the organization supply chain performance.

To the knowledge of the researcher no prior study has been conducted in the area of supply chain performance at AHAE and even if there are researches done on other organizations regarding humanitarian supply chain performance most of them are on disaster relief contexts and the scope of their study not covered the assessment from the humanitarian development aid organizations

perspective. Therefore, this study as it is done on AHAE, one of the humanitarian development aid organization, will be aimed at assessing the supply chain performance from the development aid perspective. Hence, it deployed empirical study and sought to fill the empirical gap that no former researches have been done in this area and will forward possible solution for SC problems those related with procurement, warehouse management, fleet management and information & communication like; increasing the responsiveness of the supply chain service, identifying the major factors affect the supply chain function and to take the necessary measure, improvement the collaboration between units and projects, having a smooth and effective communication etc. Accordingly, in addressing the basic concerns the research formulate the following basic research questions to be answered.

1.4 Research Questions

- How reliable is the supply chain practice of Amref health Africa in Ethiopia?
- How flexible is the supply chain practice of Amref health Africa in Ethiopia?
- How responsive is the supply chain practice of Amref health Africa in Ethiopia?
- What are the factors affecting the supply chain management performance of Amref health Africa in Ethiopia?

1.5 Research Objectives

1.5.1 General Objective

The main objective of this study is to assess the humanitarian supply chain performance of Amref health Africa in Ethiopia.

1.5.2 Specific Objectives

The specific objectives of this study are.

- To determine the extent of reliability of the supply chain practice of Amref health Africa in Ethiopia.
- To measure the flexibility of the supply chain management practice of Amref health Africa in Ethiopia.
- To measure the responsiveness level of the supply chain practice of Amref health Africa in Ethiopia.
- To identify the factors affecting the supply chain management performance of Amref health Africa in Ethiopia.

1.6 Significance of the Study

In humanitarian industry most studies done on disaster relief humanitarian context and as this one is particularly done on AHAE, a development aid organization it has a vital contribution to show what the supply chain performance looks like in development aid organization. Moreover, it shows what challenges NGOs have been facing with regard to supply chain management and as a consequence of this its effect on their performance.

And, based on this the first who benefited from this research is AHAE as it will have a clear picture in identifying what is the major challenges in the supply chain process and knowing the relationship between the supply chain performance and organization performance. It is also necessary for other humanitarian organizations, especially development aid organization in understanding the relationship between the supply chain activity and organization performance and also through the finding of this study the managers may understand the various supply chain challenges and way how to deal with them.

For government organizations, since they are the major partners of the development programs it will help them in fulfilling the expectations they have to provide during need assessment and also for their collaboration during distribution of materials and services to beneficiaries.

And, apart from that its contribution can also extend to the academics subject area since the identified problems has to be more elaborated by the academicians and researchers who would like to conduct further research in the area of SC performance in other NGOs, Governmental or private companies.

1.7 Scope of the Study

This study doesn't go through details regarding everything include in the term supply chain activity and focused only on the major supply chain activities carries out in AHA. And, also concerned on supply chain performance of Amref health Africa and expected to give an insight in relation to the research question & objectives specified above and not meant to address all the issues related to the humanitarian supply chain efficiency of INGOs operates in Ethiopia.

With regard to this I do not use all the recognized supply chain practices in my research. This is due to the fact that in the pilot discussion I had with Amref SC staffs, I realized that the major SC practice is limited with these four SC activities; procurement, warehouse, fleet/transport/ and ICT.

So that, to make a realistic assessment on the basis of the actual practice on the ground I do not consider the remaining SC practices and decided to focus on these four only.

In addition to this due to limited resources & time available at the disposal of the researcher this particular study specifically take into consideration the supply chain performance from the organization's staffs point of view and not considered other stakeholders perspectives like, Donors, government organizations, beneficiaries, other supply chain actors etc.

1.8 Definition of terms

Supply chain management: as defined by the Council of Supply Chain Management Professionals (CSCMP), “encompasses the planning and management of all activities involved in sourcing, procurement, conversion, and logistics management. It also includes the crucial components of coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers.” (Paul A. Myerson, 2015)

Non-Governmental organizations (NGO) is any non-profit, voluntary citizens' group which is organized on a local, national or international level (UN website).

Organization performance: Organizational performance refers to how well an organization achieves its market-oriented goals as well as its financial goals. (Porters Generic Strategy, 1998)

Performance measurement: According to Beamon (2004) performance measurement is vital to humanitarian organizations. This translates directly to an increased focus on supply chain for improved transparency of operations and measurement of supply chain performance.

1.9 Organization of the study

The study will be organized into five chapters. The first chapter is the introduction of the study which incorporated nine sub topics; background of the study, background of the organization, statement of the problem, research questions, research objectives, significance of the study, scope of the study, delimitation of the study, definition of terms and about the organization of the study which followed by the second chapter described that theoretical and empirical related literatures review, external and internal supply chain factors and the conceptual framework. The third chapter comprises the research study area, research design, source of data, population of the study; inclusion and exclusion criteria, instrument and method of data collection, validity and reliability test, variable measurement, method of data analysis and presentation and ethical consideration

research design and methodology. Presentation, analysis and interpretation of data will be presented in the fourth chapter. The fifth chapter summarize and conclude findings of the study and in addition it presents recommendations based on the findings of the study.

CHAPTER TWO

1. RELATED LITERATURE REVIEW

This chapter briefly discussed a systematic related literature review on the works of different scholars in the area of SCM and SC performance in humanitarian organization from theoretical literature to empirical review. It defines concepts such as humanitarian supply chain management, Humanitarian supply chain performance management, humanitarian supply chain challenges and their effect on operations and humanitarian supply chain performance measurement to obtain insights of the discipline, developed conceptual framework. Moreover, empirical review related to the topic of the study has been explored to support the conceptual framework. Based on the literature reviewed, this thesis sought to compose and evaluate those research questions and identifies measurement variables which are used for answering the research questions designed to assess the humanitarian supply chain performance of AHAE. This review will summarize factors related to supply chain performance and their effect on organization performance. Thus, the researcher presents the theoretical and empirical gaps of the chain to clearly show the importance of the study.

2.1 THEORETICAL LITERATURE REVIEW

2.1.1 The Humanitarian Supply Chain Management

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

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

According to Oloruntoba & Gray (2006) Humanitarian supply chain is the process used by not-for-profit or donor funded organizations to plan, implement, control the efficiency, cost effective flow and storage of goods and materials as well as related material, from the point of origin to the

point of consumption for the purpose of alleviating the suffering of the most vulnerable and most at risk people. The humanitarian SCM needs to coordinate and manage disaster supply chain to ensure that humanitarian organizations gain from the benefits of having a supply chain system in place and also expected to ensure that even in times of emergency, the organizations receive value for money in procurement of goods and services.

Anthony Njiiru Ngoto (2016) described that in humanitarian actions, delays in delivery or relief can cost lives. Therefore, efficiency and reliability in supply chain is a key success factor, because it ensures the smooth flow of goods and services. To save lives and alleviate suffering, the response to international emergencies must be timely, effective, appropriate, and well organized. Similar with commercial SCM, NGO supply chains comprises the planning, implementing and controlling process for the efficient, cost-effective flow and storage of goods and materials as well as related information (Thomas and Kopczak, 2005). Despite the hypothetical fit in the translation of commercial SCM to NGO delivery, NGOs have failed to embrace SCM concepts, which has led to calls for greater academic interest and debate (Kovács and Spens, 2007).

2.1.2 Performance management in Humanitarian supply chain

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

According to Oxfam report, (2009), aid should be relevant, of good quality, well managed and should be accountable with mechanisms to challenge failure and abuse. It should also build durable solutions and be sufficiently resourced. This emphasizes why mechanisms for measuring performance of humanitarian organizations are of great importance. Though, NGO's may have multiple stakeholders whose priorities differ therefore making it difficult to define humanitarian organizational performance.

The humanitarian SC performance management remains a major challenge to the HSC as the key performance indicators are not standardized as opposed to the commercial sector creating confusion and reduced donor support due to accountability issues which are highly emphasized by the donors and other key stakeholders (Beamon, 2004). So, setting a clear performance indicator at least which can serve for some specific category of industries and measuring the performance is an evitable. And, different researchers set different non-financial performance indicator metrics for the measurement of the supply chain performance.

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

On the other hand a number of researchers Stevenson & spring 2007, Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016) ,Holguin---Veras, *et al.*, 2012) suggested for the adoption of the supply chain management concepts such as agility, flexibility and responsiveness that emphasis on customer focus and to practice within the humanitarian supply chains of the relief operations, this would result in speedier and more efficient and effective response but as agility is more applicable for humanitarian context that has unstable and unpredictable demand it will be not be applicable for organizations like AMREF which works on a development programs. Jones *et al.* (2001) also argue that agility will be used downstream in a disaster response phase operation where minimal lead times are required to be able to service volatile consumer demand with high levels of availability.

According to Aurelie Charles (2010) about defining and assessing the agility of supply chains on humanitarian experience, he identified that to conduct an overall assessment of supply chain agility, he said each capability (flexibility, responsiveness and effectiveness) has to be evaluated through its evaluation grid.

Bonney J. (2003) on his research identified that a robust and scalable SC performance management system is the platform for improvement. He said it must be exception-based and allow users to prevent problems, resolve issues, capture knowledge, and sustain improvements. The SC performance characteristics with the greatest value in a supply chain are accuracy,

responsiveness, on time complete deliveries, reduction of inventory and mutual continuous improvement.

Jane K *et al.*, (2013) also described that in humanitarian actions, delays in delivery or relief can cost lives. Therefore, efficiency and reliability in supply chain is a key success factor, because it ensures the smooth flow of goods and services. Therefore, to save lives and alleviate suffering, the response to international emergencies must be timely, effective, appropriate, and well organized and for that they suggested that the humanitarian supply chain performance has to be measured in three aspects delivery, reliability, flexibility and responsiveness. Similarly, Magadi Wanner Brian and Dr. Noor Shale (2017) on their research on Role of humanitarian logistics on supply chain performance in non-governmental organizations in Kenya: a case of acted Kenya they used Reliability, Flexibility and Responsiveness as a performance measurement.

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

2.1.2.2 Supply chain reliability

Reliability or quality is a key requirement of any supply chain. Measuring the reliability of logistics processes and products is the way to improve these processes.

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

2.1.2.3 Supply chain flexibility

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

According to Healsip *et al* (2004) when applied to humanitarian action, the supply chain needs to be flexible and able to respond quickly to unpredictable events effectively and efficiently. Flexibility can be rightly regarded as a critical one. Being flexible means having the capability to provide products/services that meet the individual demands of customers. During disasters the supply chain is not as demanding because the internal infrastructure of the affected area is still intact.

2.1.2.4 Supply chain Responsiveness

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

As per Lu and *et al.* responsiveness refers to the speed at which a supply chain deliver products to the customer.

Several companies consider responsiveness of their SC as another goal to attain competitive advantages. Different definitions exist for the SC responsiveness: the capability of a SC to produce innovative products, meet short lead-times, cope with a wide range of products, and meet a high service level (Chopra & Meindl, 2013). Gunasekaran, Lai, and Cheng (2008), defined the SC responsiveness as a paradigm that has emerged in response to the volatile and competitive business environment; thus, a responsive SC has to be extremely flexible to changes of market or customer demands.

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

Table-2.1 List of Referred and reviewed articles

No	Author and year of published	Title	Identified Performance indicators
1	Mbohwa (2006)	Identifying Challenges and Collaboration Areas in Humanitarian Logistics: A Southern African Perspective.	- Fast - Agile, - Responding
2	Aurelie Charles (2010)	defining and assessing the agility of supply chains on humanitarian experience,	- flexibility, - responsiveness and - effectiveness
3	Magadi Wanner Brian, Dr. Noor Shale	Role of humanitarian logistics on supply chain performance in non-governmental organizations in Kenya: a case of acted Kenya	- Reliability - Flexibility - Responsiveness
4	Kamau (2013)	Humanitarian supply chain management in Kenya,	- Delay in delivery - Uncertainty in demand - Poor quality and Quantity of goods - Services delivered
5	Stevenson & spring 2007 Ngonidzahe K. Ngwenya ¹ and Micheline J.A. Naude ¹ (2016) ,Holguin---Veras <i>et al.</i> , 2012).	Different articles	- Agility - Flexibility - Responsiveness
6	Jane K. (2013)	Supply chain performance in humanitarian organizations in Kenya	- Reliability (Quality) - Flexibility (- Responsiveness(Time

2.1.3 Humanitarian Supply chain challenges

According to Smilowitz and Dolinskaya (2012), the main challenge of humanitarian supply chain management is to establish a flow of donations from different sources (national and international) which are not continuously useful, timely, or appropriate, with lower waste of resources. The administration of a humanitarian supply chain involves the integration and coordination of a large dispersed group of experts with a view to safeguarding the basic goal of humanitarian aid: "the provision of products and/or services to the needy, whose immediate or long-term survival can

depend on the efficient execution of operational activities of logistics and supply chain, including the crucial 'last fifty meters' (Sergio Ricardo *et al.*, 2012).

But, as per Oloruntoba & Gray (2006), the greatest SCM challenge lies in aligning the coordination of the logistical activities without compromising their mandates or belief. The humanitarian supply chain often entails high level of uncertainty in terms of demands, supplies and assessments. This makes them clearly unpredictable, turbulent and requiring flexibility. This inconsistency brings unique challenges to relief fulfillment system as the number; magnitude and complexity of global emergencies continue to increase. Kinyua also said that the logistical delays were common and had an impact on humanitarian logistics performance (Jane Kiende Kinyua, 2013)

The humanitarian SC performance management remains a major challenge to the HSC. The key performance indicators are not standardized as opposed to the commercial sector creating confusion and reduced donor support due to accountability issues which are highly emphasized by the donors and other key stakeholders (Beamon, 2004). So, setting a clear performance indicator at least which can serve for some specific category of industries and measuring the performance is an evitable.

The several metrics of supply chain performance enable firms to have a benchmark to assess their supply chain performance including internal and external firm. The application of internal linkage performance metrics results in elimination of non-value added activities, reduction in order variation, faster product flows, more efficient use of time, material and human resources, and reduction of the bullwhip effect. Benefits of usage of external linkage performance metrics include the creation of end-customer value through closer integration. (Jane Kiende Kinyua, 2013).

2.2 Empirical Literature review

This section is to review and examine an empirical researches done by different scholars on the supply chain performance of a humanitarian organization.

2.2.1 Humanitarian supply chain performance

Measuring humanitarian supply chain performance is a key challenge for HL since it is compounded by the difficulty in obtaining accurate data, limited information technology, a chaotic environment, lesser motivation, potentially negative media exposure, human resource

issues, general reluctance, the conflict between long term and short term goals and a lack of internal recognition of the supply chain (Abidi, H., Klumpp, M., de Leeuw S., 2014).

Measuring and managing performance is crucial for an efficient and effective humanitarian supply chain (Leeuw & Klumpp, 2014). For instance, performance of the relief chains would be improved through effective performance measurement systems (Beamon & Balcik, 2008). An organization that measures its performance can build and retain knowledge, and rapidly demonstrate systematic and measurable improvements (Whiting & Ostrom, 2009).

2.2.3 Challenges of Humanitarian supply chain performance

According to Rodman (2004) humanitarian operations facing challenges like uncertainty, degraded infrastructure, communications, and human resources and earmarking of funds. The results of the study also put forth a framework of SCM solutions for overcoming logistics difficulties during relief operations and explains why managers should consider their use. He analyzed barriers based on academic, organizational, contemporary literature and from available SCM literature. His work linked supply chain principles from different disciplines including private, non-profit and military sectors with an aim of benefiting humanitarian operations.

Nyamu's (2012) in the research focused on assessing the impact of SCM challenges facing humanitarian organizations in Kenya he assessed about 40 humanitarian organizations and he identified that the effect of supply chain challenges on the performance of humanitarian organizations were delay in the delivery of the right products, poor information integration and uncertainty demand among others. However, the study did not indicate to the possible solutions for the challenges faced by the humanitarian organizations.

A similarly study conducted by Peter Nyandega Agwata (2014) regarding the supply chain management challenges and supply chain performance of humanitarian organizations in Nairobi, Kenya by assessing 142 humanitarian organization in the country he concludes that SCM challenges has a negative impact on the humanitarian SC performance and the major SCM challenges that face humanitarian organizations in Nairobi, Kenya were; high turnover, uncertainty in terms of supplies, poor management of relationships with the partners in the supply chains, poor alliance management practices, lack of coordination, uncertainty in terms of assessment, poor infrastructure, lack of open and honest collaboration between the parties in supply chain which reduced the benefits in terms of better cost, flexibility, and service level, bulky materials to be transported, uncertainty in terms of demand and lack of financial resources and he

also forwarded his recommendation for the identified challenges but left with two questions for further research; The relationship between SCM challenges and employee performance in humanitarian organizations and the relationship between use of modern technology and SC Performance in humanitarian organizations.

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

Stephenson (2005) on the other hand identified that collaboration as a challenge for humanitarian organizations. According to him, relief actors operate in an environment that does not essentially encourage coordination. Coordination and management of disaster supply chains is therefore highly needed and must be put in place in the humanitarian supply chains. Christopher & Tatham (2011) also said coordination of operations of a large number of unrelated organizations as one of the major challenge.

The other major problem faced by logistics managers in humanitarian organizations is that donors significant influence over where and how aid is distributed while the victim is a third party with little voice in the matter (Long & Donald, 1995). Donor often demands as much aid as possible is to reach to the victims than the funding goes to organizational support and infrastructure which is a neglected part. Thus, distribution channels may face challenges as warehouses, equipment, communications infrastructure and training remain unimproved or deteriorating.

As we see in the above the identified factors by different researchers on different cases falls either on the internal or external SCM challenges. Hence, next we will see the internal and external factors that affects the supply chain performance that have a direct relationship which will be applicable with context of development aid perspective will be discussed subsequently.

2.2.3.1 Internal Factors affecting HSCM practices

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

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

2.2.3.1.1 Strategic Planning

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

The 'Plan processes' describe the planning activities associated with managing a supply chain includes gathering customer requirements and collecting information on available resources. And, performance measurement in humanitarian logistics balancing requirements and resources to determine planned capabilities and resource gaps. Klumpp *et al.*, 2012).

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

2.2.3.1.2 Availability of Professional staffs

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

2.2.3.1.3 Adequate use of Information Technology

Gunasekaran and Ngai (2003), says that IT is helpful when wanting to make changes in logistics information.

In the typical commercial supply chain framework, three types of flows occur; materials or goods/services, information, and finance. And, this is also the same within humanitarian supply chain management.

Due to the bureaucratic structures and overreliance on manual ways of communication Institutions information sharing is inflexible and which has an effect on supply chain management performance because of delay of information from one entity to the other (Carolyn W. Kamau, 2013).

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

2.2.3.1.4 Institutional learning practice

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

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

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

2.2.3.1.5 Supply chain Integration and collaboration

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

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

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

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

2.2.3.2 External factors affecting HSCM practices

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

2.2.3.2.1 Legal and political Factors

Different researchers described that adequate assistance from the government, fast customs clearing process, safety & security and flexibility of local governments will increase performance of humanitarian logistics (Kunz & Reiner 2012; Long & Wood 1995; Tomasini & Wassenhove 2004).

Governments hold the main power with the control they have over political and economic conditions and directly affect to supply chain processes with their decisions. (Wassenhove, 2006). According to Oloruntoba and Gray (2007), a major difficulty in coordinating the humanitarian supply chain has strong ties to the political interests and military forces of donors and recipient countries, the requirements of the industry of donors, and the lack of coordinated plans.

As per Seekins (2009), Government situational factors, such as the type of regime, the national regulations toward relief organizations, the efficiency of the state, the level of corruption, are factors which has an effect on organizations' operational decisions and their capacity to conduct

humanitarian logistics operations. (Seekins, 2009), and even a cooperative government has a factor in attracting relief organizations on its territory (McLachlin and Larson, 2011; Van Wassenhove, 2006). The security situation in a country also dependent from the government or its absence, and highly influences the performance of the logistics response (Long and Wood, 1995).

2.2.3.2.2 Donors regulation

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

The global humanitarian assistance report (GHA 2015, 2) describes that more than 75% of all contributions for humanitarian assistance were provided by governments in 2014. These governmental donations are often tied to wider political agendas and thus may not be the result of the performance of humanitarian organizations (Schiffling and Piecyk 2014, 205).

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

2.2.3.2.3 Socio-economic situational factors

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

Availability of local suppliers is among one of a Socio-economic situational factors which affect the performance of humanitarian logistics (Altay *et al.* 2009; Dowty & Wallace 2010; Maon *et al.*, 2009). In a well-developed economy, even an important items can be purchased from local suppliers, and personnel can be employed locally for logistical activities whereas in a less

developed economies, volatile operating conditions such as fluctuating freight rates and unpredictable transit schedules are prevalent. Besides, all supplies have to be imported and most tasks must be managed by expatriate staff (Kunz & Reiner 2012; Choi *et al.* 1996).

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

2.2.3.2.4 Technological Factors

As per Ngonidzahe Ngwenya & Micheline Naude (2016), to ensure a responsiveness to the natural disaster occurrences, the UNWFP have made strategic and critical investments in infrastructure and technology in which to encourage innovation across the organization and to be a visible means towards fostering efficiency.”

Balcik & Beamon also described that lack of availability of technology in the humanitarian field resulting in information being “unreliable, incomplete or non-existent” for the most part; the fixed distribution network that exists in private business with predetermined fixed locations for distribution centers; the private sector enjoys a typical inventory control whereas in humanitarian logistics there are “high discrepancies in lead time and demand location; in the private sector performance measurements are based on “maximizing profits while minimizing costs” whereas the humanitarian field measures by factors such as “response time and the ability to meet the needs of the disaster. (Balcik & Beamon, 2005).

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

2.2.3.2.5 Infrastructural Factors

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

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

2.3 Conceptual Framework

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

The independent variables were investigated with a view to finding their effect on supply chain performance in humanitarian response of AHA in Ethiopia. As an international Humanitarian organization, AHA is operating in an environment where different stakeholders, processes and flows exist to assist it to get to its ultimate goal. In order to understand the end-to-end supply chain, it is believed by the study to take a step in mapping the Supply chain frame work of AHA in Ethiopia so it will be better to illustrate the network structure and as built working processes.

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

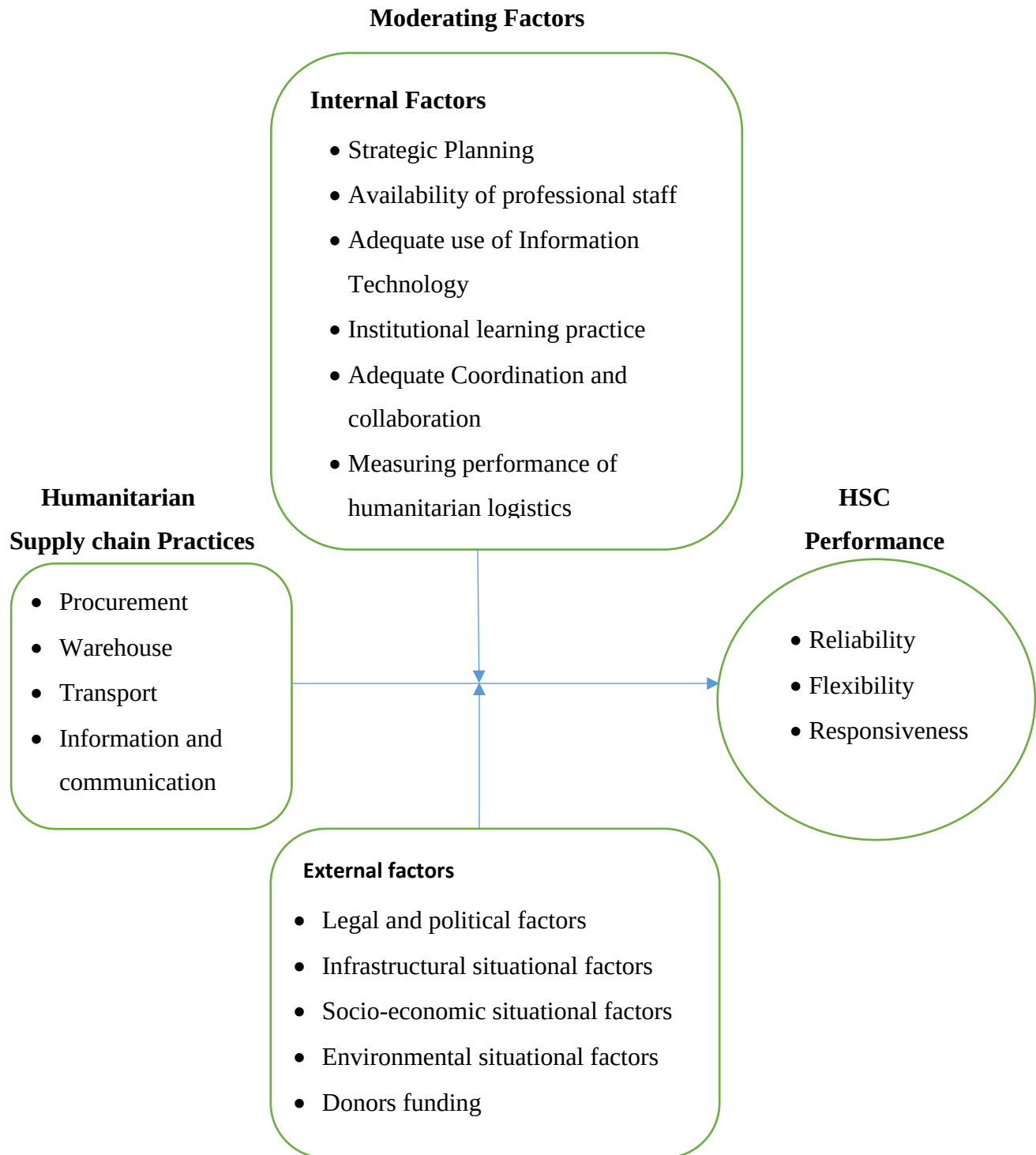


Figure 1. Conceptual frame work adapted from Modified from Kunz and Reiner (2011), Evance Odhiambo Odira (2018).

CHAPTER THREE

3. METHODS OF THE STUDY

This chapter presents and describes the research methodology that was used to achieve research objectives and answer research questions of this study. It discusses effective approaches equipped throughout the research process and structured into study area, research design, target population, method of data collection and research instruments, validity and reliability test, data analysis techniques and ethical consideration of the study along with an appropriate justification associated with each approach.

3.1 Study area and Period

The study was conducted in Amref health Africa in Ethiopia during the period October 2018 through January 2019. The study is conducted at AHA head office located at Bole sub city Addis Ababa, Ethiopia and eight field offices and two satellite offices located in 8 regions. The rationale behind the selection of the study area is because of including all the staffs that manages the key supply chain activities of the organization and others who has direct and indirect relationship with SC activity.

All workers in AHA were source population. All staffs who have a direct and indirect involvement in supply chain activities were target of the study. All staffs who have served the organization starting from six months were included to participate in the study except those who were not available during the data collection time and were not cooperative to participate in the study were excluded from participating in the study.

3.2 Research design

The study used both descriptive and explanatory research design. Accordingly, in descriptive method the study focuses on the determination of the frequency with which an event occurs and how variables are related in a particular context. And in explanatory research design the study concerned with determining the impact and cause and effect relationships among variables. Hence, this research is undertaken with descriptive and explanatory research design in order to give an adequate description of the variables and reveal the extent to which the factors of the humanitarian supply chain performance of the organization.

3.3 Research Approach

The study used quantitative research approaches. This is because the study focused on the data collected through questionnaires to give condensed pictures of the data by using SPSS while. Accordingly, the collected data presented in to two parts, in the first part the study described the relationship between the dependent and independent variables using frequency. And in the second part the study triangulate the interdependence between the dependent and independent variables using explanatory research approaches using correlation.

3.4 Source of Data

The study data were collected in both primary and secondary source. All Amref Health Africa in Ethiopia staffs are source of primary data. The Amref health Africa in Ethiopia structure has classified its staffs into two categories; Program and Support staff. The target population comprised of staff at Amref Health Africa in Ethiopia who had a direct and indirect involvement with supply chain management, as an executer and client considered for the study. Secondary data has been obtained from Amref Health Africa website, annual book, policies and strategy, annual reports documents and publications. Moreover, different journals, books, published & unpublished materials that contain data related to the study subject were used as secondary data sources. The HR department has thorough information of both program and support staff employees exist at country and field offices.

3.5 Population of the study

Participants of the study are selected based on their relevance exclusion criteria to the subject of the research. There are 8 project offices and 2 satellite offices in the 8 regional states of the country. Total there are 218 staffs in AHA Ethiopia of which 102 support staffs and 116 program staffs throughout the country.

Inclusion and exclusion criteria

Accordingly those who has direct and indirect engagement with the supply chain activity at AHA accounting 124 employees were used as the population and sample size of the study using census method. Out of the selected total 124 staffs 98 are program staffs and 26 are support.

Those staffs like; office assistance, drivers, security guards and cleaners who the researcher believed that they do not have enough knowledge to respond for the questioner are excluded from

the study. Hence, the total 124 staff of AHA, Ethiopia will be part of the study using census method.

3.6 Instrument and Method of Data Collection

In order to assess the supply chain performance in Amref health Africa in Ethiopia, both primary and secondary sources were used as a supply of data.

The primary data collected method that applied was by distribution of questionnaire. The study were adopted a structured questionnaire on Supply chain performance and associated factors. The questionnaire is prepared in English. The questionnaire has three parts: the first one is socio-demographic characteristics of the respondents and the second part deals with the identified supply chain operational performance; reliability, flexibility, and responsiveness. And the third part deals with the identified internal and external factors affecting the SC performance of Amref. The questioner is adopted from previous researches that based (Benita M. Beamon and Burcu Balcik, 2008), (Kunz and Reiner, 2012), and (Mansidão *et al.* 2014) model which is a base for conceptual frame work. To determine the performance of SC 36 items and for assessing the internal and external factors 21 items has been identified. Generally the questioner has had 3 constructs and 57 items. In addition the researcher also develops an open ended questions depend on the organization problem area.

Then, respondent were asked to rate their level of agreement to each statement by using five point Likert scaled questionnaire ranging from “Strongly Disagree” (1) to “Strongly Agree” (5) were used in the questionnaire.

And, the secondary data was collected from different articles (extensive article reviews were conducted), books, and documents from the organization data base was reviewed to supplement the primary data.

The researcher following obtained permission from the Human Resources Management of the organization to conduct the research and gave clarification for the potential respondents about the research has distributed the questionnaires into two ways: the first one is by distributing physically to 46 staffs who based at country office and the second way is sending the questioners via email for those 78 staffs who based in the field offices. And the questionnaires were collected in the same way as it is distributed. Meanwhile, a telephone follow up has been made for the timely collection of the responses.

3.7 Validity and Reliability test

This study addressed the content validity through the review of literature and adapting instruments used in previous research. Prior to the actual study, a pilot survey was conducted to determine the validity of the data collection instrument which enables to bring out the weaknesses if any of the questionnaire and the survey techniques (Kothari, 2004). Therefore before administering the questionnaire 20 copies of questionnaire were distributed to Amref staffs 16% of the total sample size was distributed as pilot scale for its validity and reliability check.

In order to ensure validity views of the respondents' obtained using questionnaire, consult relevant documents, databases and intranet. In addition, information from secondary data was also used along with responses of survey questioner which were double-checked and triangulated to ensure validity of data.

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

The reliability and the value of Cronbach's alpha reliability test showed there was acceptable internal consistency with a coefficient of higher than the agreed limit 0.7. The Aggregate Cronbach's alpha coefficient of variables for the pilot test depicted in the below Reliability Test table.

Table-3.1 Reliability test

Construct	Number of questions	Cronbach's alpha
Supply chain Reliability	9	0.848
Supply chain Flexibility	9	0.853
Supply chain Responsiveness	9	0.770
Organizational Internal factor	9	0.945
Governmental factor	4	0.834
Infrastructural factor	3	0.878
Socio-Economic Situational factor	5	0.954

Source: Own survey

As far as the study variables are concerned, this particular study has involved the supply chain drivers and with the three performance indicators and the moderating internal and external factors variables that combined in four categories for the measurement of the construct of the performance of supply chain activities. The three performance indicators are, SC reliability, SC flexibility and SC responsiveness measured through the identified SC drivers namely, procurement, warehouse, fleet & ICT. The internal and external factors constructed under different categories; Organizational Internal Factors, Governmental Situational Factors, Infrastructure Situational Factors and Socio-economic Situational Factors. Accordingly, after a comprehensive review of related literature 57 items has identified. Moreover, the dependent variable namely operational performance were measured through three separate items.

3.8 Method of Data Analysis and Presentation

The study data was analyzed using Statistical Package for the Social Science (SPSS) version 22.0 since this survey has quantitative nature and aiming at instructive the relationship between supply chain internal and external factors and operational performance of the organization, the application of statistical techniques is a compulsory requirement. Hence, demographic information of respondents was analyzed using descriptive statistics such as mean and standard deviations of the respondents' scores. Accordingly, results presented in tables; whereas, the degree of supply chain management practices in all dimensions and operational performance in the case organization

Inferential statistics, particularly, Pearson Correlation Coefficient and regression analysis was applied to analyze the relationship between Humanitarian supply chain management practices and SCM performance. Pearson Correlation Coefficient is a widely used statistical method for obtaining an index of the relationship between variables when this relationship is linear (Tharenou *et al.*, 2007).

3.9 Ethical Consideration

The data has been collected from the sample respondent through questionnaires; the respondents weren't required to write their name. The result of the study is to be used for academic purpose only and the response of the participant is fully confidential. The information that the respondent gave was analyzed without any change by the researcher. Furthermore, the work used in this research as a base for this study has cited appropriately as the researcher respect the work of

previous studies. The data's used based on the questionnaires rather than using the researcher opinion and input. The researcher stays truth full to responses of the respondents and free from any personal assessment. Results depicted only from out puts of truth full inputs.

CHAPTER FOUR

4. RESULTS, DISCUSSION AND INTREPRETATION

4.1 Introduction

This chapter deals with the analysis, findings and discussion of the objectives. Descriptive statistics analysis such as frequencies and percentages were calculated to present the general information about respondents.

In order to assess the relationship between HSC moderating factors (Internal and External factors like; Legal and political factors, Infrastructural situational factors, Socio-economic situational factors) and the supply chain drivers interms of Reliability, Flexiblity & Responsiveness, correlation analysis were conducted for scale typed questionnaire.

A total of 124 questionnaires were distributed for all staffs who selected based on the inclusion criteria; for management bodies, procurement, administration, finance, other support units and programm departments. Out of which 106 respondents have filled and returned the questionnaire. The rest 18 respondants didn't return the filled questioner within a deadline. Accordingly, the response rate was 86% and this indicates that respons rate was considered to be sufficient and representative. Mugenda, O.M and A.G (2003) stated that if the response rate to a questionnaire survey is 70% and above, it is considered valid and used for analysis and reporting.. In this ways major findings of the study summarized, conclude and recommend in chapter five. The collected data were presented and analyzed using SPSS (version 22).

4.2 General Information of Respondents and organizations.

The General Information of respondents and organizations considered in the study was the respondent's sex, age, educational qualification, years stayed in Amref, department/work unit, and total years of experience in the humanitarian sector.

Table 4.1 Demographic profile of the respondents

N=106

Variables	Items	Frequency	Percent (%)
Sex	Female	24	22.6
	Male	82	77.4
Age	20-30 Years	13	12.3
	31-40 Years	66	62.3
	Above 40 Years	27	25.5
Educational level	Below college diploma	1	0.9
	College diploma	3	2.8
	First degree (BSc, BA)	42	39.6
	MA and above	60	56.6
Years stayed in Amref	Less than 1 year	13	12.3
	1-4 years	41	38.7
	5-8 years	42	39.6
	Over 9 years	10	9.4
Department or work unit	Procurement	2	1.9
	Finance	8	7.5
	Admin	11	10.4
	Program	70	66
	Other support department	15	14.2
Experience in humanitarian sector	Below 2 years	2	1.9
	2-5 years	13	12.3
	6-10 years	50	47.2
	Above 10 years	41	38.7

Source: Own survey

4.2.1 Respondents Sex

The respondents were asked to indicate their Sex. The results presented in table-4.1 above shows that 22.6 % of the respondents were females while the rest 77.4% of the respondents were male.

4.2.2 Respondents Age

The respondents were also asked to indicate their Age. The results presented in table 4.1 above shows that 12.3 % of the respondents were 20-30 years old, 62.3 % of the respondents were 31-40 years old and the rest 25.5 % of the respondents were over 40 years old.

4.2.3 Respondents Educational Qualification of respondents

Regarding question rose to respondents about their Educational Qualification, as indicated in table-4.1; 1% had below college diploma, 2.8 % of respondents had diploma,39.6 % of respondents had first degree (BSc, BA)and the rest 56.6 % of respondents had MA and above. The result indicates that most of the respondents were qualified professionals so that they can easily understand and provide their opinion on research questionnaire.

4.2.4 Respondents years stayed in Amref

With regard to the question rose to respondents about for how many years they have been working in Amref, the results presented in table-4.1 shows that 12.3% of of the respondents had less than 1 year of work experience, 38.7% of the respondents had 1-4 years of work experience, 39.6% of the respondents had 5-8 years of work experience and the rest 9.44% of the repondants had more than 9 years of expereience. The result indicates almost all of the respondents had sound knowledge and experience in the organization to understand the supply chain activities and so that they will give sound and reliable information to the research question.

4.2.5 Respondents department/work Unit

The respondents were asked to indicate their department/work unit in the organization and the results are presented in table below.

The results indicate that about 2% of the respondents were from procurement unit, 7.5% of the respondants were from Finance departement, 10% of the respondents were from Administration department, 10% of the respondents were from warehouse department, while 66% of the respondents indicated that they were from Program department and the remaning 14% of the repondants were from other support departments. The results indicate that since the respondents were from different work units and departments it will be assessed from different perspective and als they will give an independent view of humanitarian supply chain practice and humanitarian supply chain performance.

4.2.6 Respondents total experience in humanitarian sector

Finally, respondents were asked to indicate their professional experience in humanitarian sector. And the result shows in the above Table-4.1, 2% of the respondents had less than 2 years of work experience, 12% the respondents had 2-5 Years of work experience, and 47% of the respondents had 6-10 Years of work experience and the remaining 39% the respondents had more than 10

Years of work experience in humanitarian sector. The result indicates that almost all of the respondents had sound knowledge and experience in the area to understand and give sound response for the questions.

4.3. Descriptive Statistics analysis of AMREF's SC performance

In line with the articulated objectives here effort is made to describe respondents view on their organizational supply chain management performance based on the three performance parameters of SCOR model and their view on the supply chain factors. These were further adjusted up during pilot test after discussing with the organization's SC staffs to align with the organization SC management practice. Accordingly, the researcher took the major four SC drivers of Amref; Procurement, Warehouse management, Fleet management and ICT and three performance indicators of supply chain management; SC reliability, SC flexibility and SC responsiveness metrics. And, each SC driver has 9 questions which constructed from each supply chain indicator and a total of 36 questions identified for the measurement of the SC performance.

Hence, primary data were collected about the supply chain performance of Amref health Africa in Ethiopia under the selected three broader performance measurement categories namely SC reliability, SC flexibility and SC responsiveness and an Internal and External factors that affects humanitarian supply chain performance of Amref. Based on this, respondents gauge the performance of the humanitarian supply chain of the organization using five scale likert responses namely: strongly disagree, disagree, neutral, agree and strongly agree.

Accordingly, a calculated composite mean value that ranges from 1 to 1.80 implies strong disagreement, whereas the remaining ranges of 1.81 to 2.6, 2.61 to 3.4, 3.41 to 4.2 and 4.21 to 5.00 representing respondents' perceptions of disagreement, neutrality, agreement and strong agreement respectively. Angelo Niel A. Victorino (2018).

4.3.2 SC performance frequency analysis

Table-4.2 AMREF Health Africa Humanitarian SC performance frequency analysis

The supply chain performance of Amref health Africa in Ethiopia Humanitarian operation:

SC performance Dimension	Procurement management performance of AHA Items N=106	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	Std. Dev.	Mean Of Mean
Reliability	Procurement deliver requests within the agreed lead time	1	2	21	58	24	3.96	0.77	3.82
	There is accuracy of documentation management practice	0	3	28	64	11	3.78	0.66	
	Procurement deliver as per the ordered quality and quantity	1	5	32	54	14	3.71	0.79	
Flexibility	Procurement accommodate quantity adjustment after PO	0	4	29	47	26	3.90	0.82	3.88
	Procurement maintain relationship with suppliers	0	2	37	48	19	3.79	0.75	
	Procurement experience learn and improve its practice	0	5	22	51	28	3.96	0.82	
Responsiveness	Procurement deliver the goods and services in shorter lead time	4	10	35	44	13	3.49	0.96	3.57
	Procurement ensures replacement of goods rejected by requester	2	8	35	44	17	3.62	0.91	
	Procurement is capable enough to respond for volatile demands	2	13	30	43	18	3.58	0.97	
The overall grand Mean of procurement management performance= 3.76									

Warehouse management performance of AHA									
Reliability	Warehouse distribute goods at the correct quantity and documentation	1	6	27	52	20	3.79	0.85	3.58
	Warehouse implements modern filling system to information provision	4	19	32	36	15	3.37	1.05	
	Warehouse adopt reliable system to know status of distributed goods	1	13	34	41	17	3.57	0.94	
Flexibility	Warehouse allows quick and easy mapping for unexpected shipments	6	20	39	27	14	3.22	1.08	3.51
	Warehouse smoothly distribute goods to multiple projects correctly	2	12	24	50	18	3.66	0.96	
	Warehouse continuously experience learn and improve its practice	1	10	34	42	19	3.64	0.92	
Responsiveness	Items stays in transit warehouse for unnecessary longer time	0	22	43	36	5	3.23	0.83	3.31
	Warehouse send information to project office about goods shipment	0	24	33	43	6	3.29	0.88	
	Warehouse report the status of the delivered goods to users and supplier	1	17	33	46	9	3.42	0.89	
The overall grand Mean of warehouse management performance= 3.47									
Transport /Fleet/ management performance of AHA									
Reliability	Transport control the transporters for delivery of goods without delay	0	6	27	60	13	3.75	0.74	3.60
	Transport send goods with complete and correct documents	0	14	34	45	13	3.54	0.87	
	Fleet management has mechanism to ensure safe arrival of goods	0	15	33	46	12	3.52	0.88	
Flexibility	Fleet is flexible to accommodate unexpected freight volume change	0	9	47	42	8	3.46	0.76	3.56
	Fleet is capable to negotiate with transporters for vehicles replacement	0	18	35	48	5	3.38	0.82	
	Fleet continuously experience learn and improve its practice	0	6	25	56	19	3.83	0.79	
	Amref has sufficient transporters to respond urgent transport needs	2	25	39	33	7	3.17	0.93	3.35

Responsiveness	Fleet update requesters about the status of the shipped goods regularly	0	17	27	47	15	3.57	0.93	
	Amref transporters respond urgent transport need in short notice	4	22	27	42	11	3.32	1.04	
The overall grand Mean of fleet management performance= 3.50									
Information Communication performance of AHA									
Reliability	No frequent information communication interruption in the SC	3	19	23	56	5	3.39	0.93	3.45
	ICT improves supply chain service documentation accuracy	3	18	17	49	19	3.59	1.06	
	ICT contributes to the cost minimization of the total SC expense	5	15	35	37	14	3.38	1.04	
Flexibility	Exchange of information takes place frequently, informally and timely	3	17	25	49	12	3.47	0.99	3.54
	ICT improves ability of supply chain to rapidly response	4	18	29	44	11	3.38	1.01	
	ICT continuously experiment, learn and improve its practice	2	8	24	52	20	3.75	0.91	
Responsiveness	ICT increases timely information sharing with project offices	2	9	21	60	14	3.71	0.87	3.74
	ICT increases performance of SC by improving delivery speed	4	7	27	47	21	3.70	0.99	
	ICT improve in delivering information to correct place and time	4	7	19	50	26	3.82	1.00	
The overall grand Mean of information communication performance= 3.58									

4.3.2.1 The supply chain performance of Amref health Africa in Ethiopia Humanitarian operation: Procurement management performance

Referring to Table-4.2 above about the procurement performance, the highest mean score is procurement flexibility, with the mean value of 3.88 and a standard deviation 0.49 2 implied that, the organization has a flexible procurement service in terms of easily adaptable to accommodate quantity adjustment after placing order, maintaining a good relationship with suppliers to ensure the timely delivery of urgent and unplanned requests and continuously improve its practice to improve its service delivery which is followed by procurement reliability and responsiveness with mean value of 3.82 and 3.57 respectively which still needs improvement and this result is consistent with previous research done by Jane Kiende Kinyua (2013). As per her research 85% of the organisations interviewed experienced delays in procurement process. Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016) also confirmed on their research on Supply chain management best practices of humanitarian aid in southern Africa they identified visible gaps on procurement related with agility, flexibility and responsiveness. Therefore, these poor performance of procurement reliability and responsiveness will have a major effect on organization performance since it will not be responsive in replacing defect goods and lack to intertain demand volatilities, not able to deliver good quality of goods and services, create delays in goods and service delivery and as a consequence of this it will affect organization program performance and its visibility, will create dissatisfaction on beneficiary and also will lead for an additional unplanned expense.

4.3.2.2 The supply chain performance of Amref health Africa in Ethiopia Humanitarian operation: Warehouse management performance

Regarding warehouse management performance in Table-4.2 the highest mean score is warehouse reliability with the mean value of 3.58 which is followed by warehouse flexibility and responsiveness with mean value of 3.51 and 3.32 respectively. And mathematically the mean is above average but still need improvement and this also supported by the work of Ngwenya and Micheline J.A. Naude (2016) they suggested that supply chain distribution networks need to be properly structured in order to be optimised by Identifying strategic locations for storage and warehousing facilities to effectively supply. Accordingly, as the lowest mean in warehouse management registered on warehouse flexibility and responsiveness and to mitigate the challenges warehouse has to work on upgrading and improvement of its information database and

exchange system so that it can easily manage the goods distribution, able to provide timely information for the users, so that projects can make an earlier plan realignment and finally, it will avoid the unnecessary burden it can fetch to the next SC activity, the transportation service delivery.

4.3.2.3 The supply chain performance of Amref health Africa in Ethiopia Humanitarian operation: Transport /Fleet/ management performance

Table 4.2 shows in Transport /Fleet/ management performance the highest SC performance is secured in Transport /Fleet/ reliability with the mean value of 3.60 which is followed by Transport /Fleet/ flexibility and responsiveness with mean value of 3.56 and 3.35 respectively and this shows Amref still needs to work to improve its fleet service. This result also supported with previous research done by Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016) they identified that the transportation of personnel, infrastructure and the timely distribution of supplies to the affected areas, incur high costs in performing logistics and transportation costs as an underlying transportation challenges. Magadi Wanner Brian and Dr. Noor Shale (2017) on their research on the role of transport management on supply chain performance in non-governmental organizations in Kenya they concluded that transport management has a significant influence on supply chain performance. ACTED Kenya through effective transport management practices was able to; select the most suitable mode of transport based on the urgency of the disaster, perform direct shipment especially for items that had to be delivered in the shortest time possible and outsource transport that has led to a decrease in transport operating cost and fast response to demand. This is also strengthened by Carolyn Wanjiku Kamau (2013) that inadequate transportation modes also present challenges in accessing affected areas at mean value of 4.11. Therefore, the transportation flexibility and responsiveness is a bridge between the organization and beneficiaries because without it goods can't be delivered to community. Similar to the warehouse management fleet has to upgrade its information and communication with other departments, need to have a framework agreement with more than one service provider so that it can increase its negotiation power.

4.3.2.4 The supply chain performance of Amref health Africa in Ethiopia Humanitarian operation: Information Communication performance

Finally, referring to Table-4.2 about the Information communication performance the highest mean score is ICT responsiveness with the mean value of 3.45 which is followed by ICT

flexibility and reliability with mean value of 3.54 and 3.74 respectively and which is above the average mean but still needs improvement. This result also consistent with previous research done by Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016) that they identified information gap regarding timely and accurately determining the needs of affected communities, lack of visibility between the supply chain partners, communication breakdowns during relief operations particularly during severe disaster operations. According to Sylvia Wangari Kuria (2014) on her research on supply chain le-agility and performance of humanitarian organizations in Kenya the findings showed that most of the humanitarian organizations have ICT systems that are not robust enough to support supply chain leagility with a mean of 4.83. Without a reliable ICT, logistics can't efficiently perform its service delivery and a delay in information exchange will have a cost trade-off and it will have a financial impact on the SC performance and the same is true with ICT flexibility because rapid information adjustment will affect the total SC process and this also will have an effect on the organization performance and also the budget as well.

4.3.2.5 Combined Respondents' Perception on Humanitarian SC performance of Amref health Africa in Ethiopia

Table-4.3 Composite scores grand mean and standard deviation of SC practices of Amref

Descriptive Statistics			
	N	Mean	Std.
Procurement	106	3.76	0.42
Warehouse performance	106	3.47	0.45
Transport performance	106	3.50	0.39
ICT Performance	106	3.58	0.56

Table-4.4 Composite scores grand mean and standard deviation of SC performance dimensions

SC Performance	N	Mean	Std. Deviation
SC Reliability	106	3.61	0.34
SC Flexibility	106	3.62	0.36
SC Responsiveness	106	3.49	0.43

Source: Own survey

As it can be seen in table 4.3 Among Amref's supply chain practices the top mean registered by Procurement performance with mean value at 3.76, then the second top socre is ICT Performance with mean value at 3.58 which is to be followed by Transport performance and Warehouse performance with mean value of 3.50 and 3.47 respectively.

In table-4.4 that shows the summerized SC performance the mean values of each of the scales of supply chain performance were calculated between 3.49 and 3.62 with almost comparable standard deviations that range between 0.33 and 0.43. The lowest mean value is registered in the case of SC Responsiveness with mean value of 3.4 followed by the mean score for SC Reliability 3.61; while SC Flexibility scored comparably close mean values 3.62.

As per the research result Amrefs SC performance avarage mean was above the average and this also aligned with previous research done by Jane K. Kinyua (2013). As per her research regarding supply chain performance of humanitarian organisations in Kenya she identified that over half of the humanitarian organizations covered by his research the supply chains reliability ensured by 50% of them, SC flexibility by below half (47.4%) and able to deliver supplies in right quantities and only 30% of supply chains are able to meet deadlines (responsive) in humanitarian operations.

This result also concurred with the study of Magadi Wanner Brian and Dr. Noor Shale (2017) on their research on Role of humanitarian logistics on supply chain performance in non-governmental organizations in Kenya they identified that all the four humanitarian logistics dimensions flexibility, responsiveness, and reliability significantly and positively affect supply chain performance through inventory prepositioning, transport management, ICT integration and strategic partnership. Similary a study done by Evance Odhiambo Odira (2018) on supply chan management practices and performance of relief humanitarian organizations in Kenya shows that the three supply chain performance indicators scored mean value of 4.10 and above

4.3.2.6. Factors affecting the supply chain performance of AHAE

The fourth objective of the study was to assess factors affecting the supply chain performance of AHAE. The findings are as shown in the subsequent sections.

Table-4.5 SC Internal & External Factors frequency [5 scale result]

Internal and External Factors	Factors	N	Mean	Std. Deviation	Mean of Mean
Organizational Internal factors	Unavailability of adequate funding	106	3.21	0.93	3.08
	Budget unavailability committed for SC	106	3.15	0.96	
	Unavailability of trained and experienced staffs	106	2.61	0.95	
	Limitation of hiring enough SC staffs	106	3.35	1.04	
	Unavailability of updated SC policy	106	3.08	0.95	

	Inconsistency by staff in application procedures	106	3.38	1.13	
	Lack of coordination among SC partners	106	3.25	1.02	
	Lack of managerial commitment	106	2.63	1.08	
	Organizational culture resistance to change	106	3.08	1.09	
Governmental Situational Factors	Unavailability of joint planning with partners	106	3.20	1.11	3.44
	Lack of inter-agency coordination & collaboration	106	3.77	0.83	
	Lack of assistance from government bodies	106	3.05	1.01	
	Government restrictions or bureaucracy	106	3.75	0.90	
infrastructural factors	Unavailability of all-weather alternative roads	106	3.84	0.87	3.84
	Lack of adequate ICT networking infrastructure	106	3.87	0.86	
	Unavailability of warehouses at project office areas	106	3.82	1.08	
Socio Economic Internal factors	Cultural restrictions or norms	106	2.85	1.01	3.77
	Inability of local suppliers to understand PR or PO	106	3.88	0.88	
	Unreliability of local suppliers	106	3.93	0.75	
	Unavailability of quality goods in local market	106	4.10	0.79	
	Absence of potential local suppliers	106	4.09	0.79	

Source: Own survey

From table-4.5 of previous page we can see that the most top challenges that affect Amref's supply chain performance found in the infrastructural factors and Socio-economic situational factors. The governmental factor and Organizational factors have lesser effect on the supply chain performance of the organization. This is also confirmed in the below table-4.6 which describes the summarized mean of SC Internal & External Factors.

Table-4.6 Combine grand Mean of Internal & External Factors affecting the HSC performance of AHA

SC Internal & External Factors	N	Mean	Std. Deviation
Organizational Factor	106	3.09	0.50
Governmental Situational Factors	106	3.44	0.63
Infrastructure Situational Factors	106	3.84	0.65
Socio-economic Situational Factors	106	3.77	0.48

Source: Own survey

Table-4.5 and Table-4.6 describes that the mean values of each of the combined scales of supply chain factors were calculated between 3.08 and 3.84 with almost comparable standard deviations that range between 0.48 and 0.65.

Among the factors the top mean value is registered in the case of Infrastructure Situational Factors with a mean value of 3.84 which implies that the infrastructure problem like, unavailability of all weather alternative roads, lack of adequate ICT networking infrastructure and unavailability of warehouses at project office areas highly affect the supply chain performance. It's aligned with the research done by Jane K. Kinyua (2013), Carolyn Wanjiku Kamau. (2013) and Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016) regarding supply chain performance of humanitarian organizations in Kenya and South Africa.

The second highest mean value Socio-economic situational factors with a mean value of 3.77 which implies that the infrastructure problem with regard to cultural restrictions or norms, Inability of local suppliers to understand purchase request or purchase order, unreliability of local suppliers, unavailability of quality goods in localmarket and absence of potential local suppliers the second highly affeted factor of the supply chain performance. This result also supported by the research done by Jane K. Kinyua (2013) regarding supply chain performance of humanitarian organizations in Kenya infrastructure factor mean is 4.5 and also identified as a major challenge by the research done by Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016).

The third affectng factor is Governmental situational factors with mean value of 3.44 and it indicates that the organizations is good in joint planning with partners, has good interagency coordination and collaboration, get enough assistance fromgovernment bodies and No as such government restrictions or bureaucracy. It's confirmed by the research done by Jane K. Kinyua (2013) on 40 respondents selected out of total population of 70 humanitarian organizations. His research supported that most of the humanitarian organizations experience government bureaucracy negatively.

The fourth least affecting factor is Organizational factors with mean value of 3.08 and it indicates that an internal factors has minimum effect on the SC performance with regard to high managerial commitment, allocation of enough budget for the SC, hiring trained and experienced staffs, has good SC policy, has minimum organizational culture resistance to change but it needs to improve regarding the inconsistency in application of SC procedures by staffs, lack of coordination among

SC partners, hiring enough staffs for the supply chain activities are the areas among the internal factors which needs to be improve. This also supported with the finding of the research done by Jane K. Kinyua (2013) and Daniel Willner and Stavros Zafeiridis (2013), they identified that organizations which is inadequate resources, lack of coordination among the supply chain partners, lack of managerial commitment, high employee turnover and internal budget constraints have a great effect on the organizational performances.

Accordingly, the infrastructural factors will be an obstacle on delivering of quality goods to the beneficiaries as will exposed the goods for expiration, obsolescence and will create a delay on program delivery. The socio economic related factors will affect the quality of the goods and services to be delivered, affect the reliability of the organization during nonperformance due to suppliers' inefficiency.

4.4 Inferential Statistics for Humanitarian supply chain Internal and External factors and supply chain Performance of the organization.

4.4.1 Correlation Analysis

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

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

The result of the correlation analysis conducted to analyze the relationship between the dimensions of supply chain factors and operational performance in the light of each research objectives using Karl Pearson's coefficient of correlation (or simple correlation) analysis as it is the most widely used method of measuring the degree of relationship between two or more variables is presented on the following table:

4.4.1.1 Correlation Analysis between Construct of HSC factors and SC Performance

To find out the relationship between organizational humanitarian supply chain performance and predictors (independent variables) Pearson's correlation coefficient (r) which measures the

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

Table-4.7 Correlation coefficient analysis

		Supply chain Performance
Organizational Factor	Pearson Correlation	-.241*
	Sig. (2-tailed)	0.013
	N	106
Governmental Situational Factors	Pearson Correlation	-.268**
	Sig. (2-tailed)	0.005
	N	106
Infrastructure Situational Factors	Pearson Correlation	0.063
	Sig. (2-tailed)	0.523
	N	106
Socio-economic Situational Factors	Pearson Correlation	-0.126
	Sig. (2-tailed)	0.197
	N	106
**. Correlation is significant at the 0.01 level (2-tailed).		
*. Correlation is significant at the 0.05 level (2-tailed).		

Source: Own survey

Based on the respondents response in the descriptive analysis parts it was indicated that the highest mean value registered on infrastructure situational factors and socio-economic situational factors respectively and which is followed by governmental situational factors and organizational factor. However, when we come to the correlation part, as it can be seen in the above table-4.6 all the internal and external factors are negatively affected the SC performance except infrastructural factor.

The Pearson product correlation of the above table 4.7 of factors affecting the SC performance of AHA we can see that two of the SC factors ; Governmental Situational Factors and Organizational factor have significant negative correlation at ($r = -.268^{**}$) and ($r = -.241^{*}$) respectively with the organization's Humanitarian supply chain performance and similarly, Socio-economic situational factor negatively but not significantly affect the SC performance at ($r = -.126$). However, the remaining one factor, the Infrastructure situational factors has a positive moderate correlation with the SC performance at ($r = 0.063$), but found to be not significant.

Therefore, as per the Pearson product correlation of the above table 4.7 the relationship between Governmental factor and operational performance indicated correlation coefficient of ($r = -.268$) and significance value of 0.005 shows there was a statistically negative correlation between Governmental factors and operational performance. This indicates SC performance is affected by, lack of joint planning with partners, lack of interagency coordination and collaboration, unavailability of enough assistance from government bodies and due to government restrictions or bureaucracy. It's also confirmed by the research done by Jane K. Kinyua (2013) on 40 respondents who selected out of total population of 70 humanitarian organizations. His research supported that most of the humanitarian organizations experience government bureaucracy negatively.

In the above Table-4.7 the relationship between organizational factor and operational performance ($r = -.241$)) and a significance value of 0.013 indicated there was a statistically but weak significant negative correlation between organizational factors and operational performance this means SC performance will be highly affected by, unavailability and adequate funding, budget unavailability committed for sc, unavailability of trained and experienced staffs, limitation of hiring enough sc staffs, unavailability of updated sc policy, inconsistency by staff in application procedures, lack of coordination among sc partners, lack of managerial commitment and organizational culture resistance to change.

The finding also confirmed by Daniel Willner and Stavros Zafeiridis (2013), they identified that organizational performances will greatly be affected by inadequate resources, lack of coordination among the supply chain partners, lack of managerial commitment, high employee turnover and internal budget constraints.

Jane K. Kinyua (2013) result of organizational factors only (30%) of the interviewed organisations had financial capability and a majority 30 organisations (75%) were forced to scale down their budget during emergencies. (80%) of the interviewed organisations had access to trained manpower during emergency operations. Meanwhile 32 organisations (80%) had an emergency plan of action but only 18 (45%) executed the plan of action during emergencies. All organisations interviewed had established procurement procedures however, only 85% used the procedures during emergency. 85% of the organisations interviewed experienced delays in procurement process.

The third factor Socio-economic situational factors, Pearson product correlation of the above table 4.7 shows the relationship between Socio-economic situational factors and operational performance indicated there was a statistically negative correlation ($r=-.126$)) but with insignificance value of 0.197. Which implies that the Socio-economic situational factors with regard to cultural restrictions or norms, inability of local suppliers to understand purchase request or purchase order, unreliability of local suppliers, unavailability of quality goods in local market and absence of potential local suppliers the second highly affected factor of the supply chain performance. this result also supported by the research done by Jane K. Kinyua (2013) regarding supply chain performance of humanitarian organizations in Kenya infrastructure factor mean is 4.5 and also indicated that 40% of the organisation received support from the host communities, 65% experienced cultural restrictions. Only 40% experienced staff deployment due to cultural resistance. 55% of the organisations interviewed experienced diversion of supplies as a major challenge. Similar study done by ngonidzahe k. ngwenya and micheline j.a. naude (2016) also showed socio economic situational factor has an impact on SC performance.

As per this research the factor which has a least correlation with SC performance is Infrastructure Situational Factors has a positive correlation ($r=0.063$)) but with moderate value of 0.523 which implies that the aforementioned infrastructure indicators like, unavailability of all weather alternative roads, lack of adequate ICT networking infrastructure and unavailability of warehouses at project office areas doesn't have no effect on the organization supply chain performance. This result

contradicted with the research done by Jane K. Kinyua (2013), the results in her research revealed 85% of the experienced delay in goods and manpower. 85% of the organizations interviewed indicated high transport prices affect supply chain performance. According to his research a majority of the organizations 26 (65%) use road transport only 10% use air transport and below 25% of the firm indicated the cost of transport is very high, 65% slightly high and 10% within range. Similarly studies done by Carolyn Wanjiku Kamau. (2013) and Ngonidzahe K. Ngwenya and Micheline J.A. Naude (2016) therefore further study has to be done to assess the effects of the infrastructural factors on the SC performance.

Accordingly, in general as per the above correlation analysis Amref's HSC performance negatively affected by governmental, organizational and socio-economic factors. This implies that a change made in one of the above independent variables can change organization supply chain performance. Hence any improvement in one of these dimensions will positively contribute in enhancing the organization effectiveness.

4.4.1.2 Regression Analysis

This study tested the cause and effect relationship between the supply chain internal and external factors and organizational performance using regression analysis. In order to see the effect of SC factors on logistics performance a linear regression analysis was employed. This allows us to make statements about how well one or more independent variables will predict the value of a dependent variable. According to Chatterjee and Hadi (2006), the true relationship between independent variables and dependent variables can be approximated by the regression model: The four variables under SC factors were entered into regression analysis to determine their relative importance in contributing to the overall Supply Chain Performance.

4.4.1.3 Multicollinearity assumptions

According to Robert (2006), Multicollinearity is a situation in which the independent/explanatory variables are highly correlated. Before conducting the regression analysis Tolerance and Variance Inflation Factor (VIF) values were calculated to check multicollinearity and the result is presented on table-4.8 below. It is an ideal approach of measuring the multicollinearity is through examination of the variance inflation factors (VIFs) or the tolerances of the explanatory variables. The Tolerance value is an indication of the percentage of variance in the predictor that cannot be accounted for by the other predictors implying the fact that very small values indicate overlap or

sharing of predictive power. According to Mendard, (1995) Tolerance should be more than 0.2 and VIF (Variance Inflation Factor) should be less than 10 (Myers, 1990).

Table-4.8 Multi Collinearity Test of independent variable

Coefficients ^a		Collinearity Statistics	
Model		Tolerance	VIF
1	Organizational Factor	.816	1.226
	Governmental Situational Factors	.694	1.441
	Infrastructure Situational Factors	.712	1.404
	Socio-economic Situational Factors	.818	1.223

a. Dependent Variable: Supply chain Performance

Source: Own survey

4.4.1.4 Multiple regression analysis result

Regression is a statistical tool that allows us to predict the value of one continuous variable against one or more other variables. When performing a regression analysis each independent variable is associated with specific coefficients in the equation that summarizes the relationship between that independent variable and the dependent variable. Once we estimate a set of coefficients in a regression equation, we can use hypothesis tests and confidence intervals to make inferences about the corresponding parameters in the population. We can also use the regression equation to predict the value of the dependent variable given a specified set of values for our independent variables (Coster 2004).

In this study, simple linear regression is used to predict the value of a single continuous direct variable (Y) from a single continuous independent variable (X). Regression assumes that the relationship between independent variable and the dependent variable can be represented by the equation: $Y = A + B_1X_1 + B_2X_2 + \dots + B_nX_n + \varepsilon$

Where: Y= the predicted/dependent variable

A= constant

B= unstandardized regression coefficient

X= value of the predicted coefficient

ε = is the error term

Thus, in this study the following multiple equations were used to predict the level of performance of humanitarian logistics from four independent variables with 21 constructs.

$$PoHL=A-B1O+B2G+B3I+B4S+ \epsilon$$

Where: O= Organizational Situational Factor (OSF)
G= Government Situational Factor (GSF)
I= Infrastructural Situational Factor (ISF)
S= Socioeconomic Situational Factors (SESF)

4.4.1.5 Association of individual independent variables with dependent variable

Coefficient of Determination

As per the SPSS generated the relationship between the supply chain performance and affecting factors of table 4.8 below, the regression equation for the study is presented as follows:

$$AHSCP_o=-4.112-0.184O+0.310G+0.89SE+\epsilon$$

Table-4.9 Summary of Regression coefficients of determination

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	4.112	.256		16.039	.000	3.603	4.620
	Organizational Factor	-.111	.061	-.184	-1.816	.072	-.232	.010
	Governmental Situational Factors	-.148	.052	-.310	-2.825	.006	-.251	-.044
	Infrastructure Situational Factors	.136	.050	.298	2.750	.007	.038	.235
	Socio-economic Situational Factors	-.056	.064	-.089	-.878	.382	-.182	.070

a. Dependent Variable: Scupply chain Performance

Source: Own survey

According to the findings, the regression equation established that, taking all SCM challenges to be constant at zero, supply chain performance of relief organizations will be 4.112. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in organizational factor will lead to a -.184 decrease on the SC performance of Amref; a unit increase in governmental factors will lead to a -.310 decrease in impact of SC performance of Similarly, A unit increase in Socio-economic situational factors will lead to -.089 decrease on the

SC performance of Amref Ethiopia. However, organizational factor and socio economic situational factors though influencing the SC performance of AHA found to be not significant.

On the other hand a unit increase in infrastructure situational factors will lead to 0.298 increase SC performance.

Table-4.10 Summary of Regression model of performance of Humanitarian Logistics

Model Summary ^b									
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.712 ^a	.507	.383	.785	.507	4.107	21	84	.000

a. Predictors: (Constant), all the 21 internal and external factors

b. Dependent Variable: Supply chain Performance

Source: Own survey

As can be viewed from table-4.10 above, The four factors, represented by the R² variables that were studied, explain that only 38.3% of the supply chain performance of Amref health Africa in Ethiopia. The remaining 61.7% of variability in performance of Humanitarian SCM is explained by other factors which are not considered in the study. Therefore, further research should be conducted to investigate the other SCM challenges that affect SC performance of the organization.

Although the percentage of the variables explained by the model is not as such strongly expressed the expected affecting factors the variable relationship explained in the table-4.9 shows there is a highly negative relationship between the two independent variables with the dependent variable.

Consequently, the supply chain performance of Amref Ethiopia humanitarian operation found to be more flexible & reliable. Whereas, among the major challenges hindering the supply chain performance of AHA Ethiopia Infrastructure Situational Factors and Socio-economic Situational Factors have found to be the top and major challenges for the organizations service deliver.

Hence, in the next chapter the summarized findings of the study has discussed and based on these conclusions and possible recommendations has presented.

CHAPTER FIVE

5. SUMMARY OF MAJOR FINDINGS, CONCLUSION AND RECOMMENDATION

5.1 Introduction

This chapter deals with the summary of major findings, conclusions and recommendations. It is aimed to assess the humanitarian supply chain performance of Amref health Africa in Ethiopia based on Score model supply chain performance assessment framework. Specifically, the study is intended to explore and test if there is a possible relationship among the following basic research questions about HSC Reliability, Flexibility and Responsiveness and HSC performance and to identify what are the significant factors affecting the SC performance.

- To determine the extent of reliability of the supply chain practice of Amref health Africa in Ethiopia.
- To measure the flexibility of the supply chain management practice of Amref health Africa in Ethiopia.
- To measure the responsiveness level of the supply chain practice of Amref health Africa in Ethiopia.
- To identify the factors affecting the supply chain management performance of Amref health Africa in Ethiopia.

5.2. Summary of findings

The study revealed that respondents strongly agreed with the SC flexibility and reliability on operational performance with computed mean value of 3.62, and 3.61 respectively, on moderate level about SC responsiveness with mean value of 3.49.

Therefore, this implies that the SC responsiveness is the low registered performance indicator as SC takes longer lead time in delivering of goods and services, poor strategy to entertain demand volatility, nonresponses for replacement of rejected or damaged goods, delay in information sharing and communication gaps between country office and field offices, delay in shipping goods and their staying in transit warehouse for unnecessary longer time, poor communication between country office SC units and project offices.

With regard to the results for the supply chain internal and external factors; the highest mean registered on infrastructure situational factors at mean value 3.84, however, a positive correlation

coefficient of ($r=0.063$)) with moderate value of 0.523 implies that the SC service delivery of Amref's is not affected by the identified infrastructural factors rather its more affected by the rest of the identified internal and external factors.

Accordingly, the correlation findings revealed that Governmental Situational Factors and Organizational factor have significant negative correlation at ($r= -.268^{**}$) and ($r= -.241^{*}$) and Socio-economic situational factor negatively but not significantly affect the SC performance at ($r= -.126$).

5.3. Conclusions

The research was conducted to assess the supply chain performance of Amref Ethiopia by analyzing each supply chain practice against the selected performance dimensions, reliability, flexibility and responsiveness. And, also to assess the effect of internal and external factors on the SC performance of the organization.

Based on the results of this study respondents were not highly satisfied with the supply chain service provision of Amref. And their response mean value was 3.49 for SC Responsiveness 3.61 for SC Reliability and 3.62 for SC Flexibility.

Regarding the internal and external factors the correlation result shows that Amref's supply chain is negatively affected by Governmental, Organizational and Socio-economic situational factors.

As per the assessment of this study and also the referred different articles it is understood that exercising performance evaluation of supply chain practice of a humanitarian organization is useful and also they have to assess the affecting factors as its helpful for organizations to know what is the status of their service provision and able them to take the necessary mitigations against the affecting factors.

5.4. Recommendations

Based on the findings discussed, there is a need for improvement in the supply chain system and also necessary to work to mitigate the negative effect of the internal and external factors. As the correlation and regression analysis depicted that there is a significant relationship between SC factors and SC performance. Therefore, by minimizing or avoiding the factors the SC performance of AMREF can be improved.

Amref should increase SC responsiveness;

- By creating a culture between concerned departments for the joint development of the organization SC demand plan, since this will help to minimize delays caused from misunderstandings,
- Developing a system for a regular supplier performance evaluation and make a through checking of suppliers performance during selection
- To make a strategic procurement for major goods and services; by signing a framework agreement with multiple suppliers help to have an effective response level.

The analysis done for internal and external factors, although for most of the external factors they are beyond the control of the organization they could be mitigated by adjusting its internal system and policies.

The Governmental situational factors might increase due to different reason and the main one is poor performance of the organization and the other one is external factors. Therefore, to avoid this Amref should strength its relationship with government organization for working on joint planning, has to be successful in its program implementation activities as this contribute for a good relationship with beneficiaries and also government bodies, so that government organization extend their support and the relationship with respected federal and regional government bodies will be strengthen.

For the organizational related factors the assessment shows that Amref is good in utilizing its internal strength, however it has also to minimize organizational related factors like; cultural change resistance attitude by providing continuous trainings and making staffs part of the process prior to implementation of any new practices, so that staffs will be more flexible and can give their utmost support for the users,. For factors related with inadequate funding and budget unavailability committed for the SC and staffing, the organization has to work hard on convincing of donors for their funding for staff development and strengthening SC working units. Finally for the unavailability of updated SC policy Amref has to review and update the existing SC policy in a way it can increase the reliability, flexibility and responsiveness of the total SC performance.

Regarding socio-economic related factors which resulted from the absence of local suppliers, unavailability of quality goods in local market and unreliability of suppliers, Amref should design different SC strategies like, approaching multiple suppliers for a single but bulk procurement, for specification related issues to make market assessment for the availability of

an alternative products rather than stacking on limited brands or specifications, try to source from foreign markets using its international offices. And, to solve the inability of local suppliers on understanding of purchase requests and purchase orders the organization needs to have a strategic suppliers who can easily understood all the organization requirements, to apply the strategic sourcing form approved vendors for most of its procurements so that the organization can maintain & strength relationship with the selected vendors who already become familiar with the organization requirements.

5.5. Limitation and Suggestions for Future Studies

A limitation of this study is that its focus was on assessing the SC performance of Amref Ethiopia and the affecting factors. As a result, it targeted the organization's staffs only and has not captured the perspective of other stakeholders; beneficiaries, government bodies and donors about the performance of supply chains in order to draw conclusions from more informed stand point. In addition to this, since the study adopted a case study design on a single organization, it might be possible that the findings may not reflect the success and challenges of all humanitarian organizations and similarly the recommendations also might not be the final and sole solutions. It is, therefore important that the present study can further be extended by including external stakeholders (i.e. Beneficiaries, host government, other service providers and the donors) and also by covering more NGOs and humanitarian supply chain actors.

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APPENDIX I: Questioner

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

Questioner to be filled by Amref health Africa staffs

Dear respondents, I'm a graduate student at Addis Ababa University College of Commerce in the Department of Logistics and Supply Chain Management. Currently, I'm conducting a research entitled 'Humanitarian Supply Chain Performance of Amref health Africa in Ethiopia' as a partial fulfillment of the requirements for the Degree of Master of Arts in Logistics and Supply Chain Management, Addis Ababa University, School of Commerce.

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

Sincerely yours,

Molalign Mekonnen

Instruction:

1. No need of writing your name.
2. Indicate your answer with a check mark (✓) or (X) on the appropriate block/cell for all questions.
3. If you need further explanation please contact me and discuss the matter freely at (Telephone No. 0911 168374, E-mail manmol2000@gmail.com)

Part I: General Information. This part of the questionnaire, intended to gather general information about the background of the respondent and the organization.

1.1 Sex 1) Female ☐

2) Male ☐

1.2 Age 1) under 20 Years ☐ 3) 31-40 Years ☐

2) 20-30 Years ☐ 4) above 40 Years ☐

1.3 Educational Qualification:

1) Below college diploma ☐ 3) First Degree (BSc, BA) ☐

2) College diploma ☐ 4) MA and above ☐

1.4 Years stayed at the organization: (Amref)

1) Less than 1 Year ☐ 3) 5-8 Years ☐

2) 1-4 Years ☐ 4) Over 9 Years ☐

1.5 Your department/work unit:

1) Procurement ☐ 3) Admin ☐ 5) other support department ☐

2) Finance ☐ 4) Program ☐

1.6 How long have you been working in humanitarian sector?

1) Below 2 Years ☐ 3) 6-10 Years ☐

2) 2-5 Years ☐ 4) above 10 Year ☐

Part II: Supply chain operational performance; **Reliability, Flexibility and Responsiveness**

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

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

Please indicate the degree to which you agree with the following statements regarding the supply chain operational performance of Amref health Africa in Ethiopia pertaining to Humanitarian Development Aid operation.

Supply chain operational performance; Reliability, Flexibility and Responsiveness

Measurement Items for Supply chain operational performance		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Procurement						
Reliability	Procurement is effective in delivering all the ordered goods within the agreed lead time.					
	There is accurate documentation management practice in procurement in terms of document completeness, correctness and readily available.					
	Procurement was able to deliver all the requested goods and services as per the ordered quality and quantity.					
Flexibility	The procurement system is easily adaptable to accommodate quantity adjustment after placing order.					
	The existing procurement practice helps to continuously develop strategy based on maintaining a good relationship with its major suppliers to ensure the timely delivery of urgent and unplanned requests.					
	The procurement practices continuously experience, learn and improve its practice to improve its service delivery.					
Responsiveness	Procurement deliver the goods and services in a shorter lead time					
	Procurement practices ensures the replacement of those goods rejected by the requester. (Amref)					
	Procurement is capable enough to respond for volatile demands.					

Warehouse					
Reliability	Warehouse units distribute all the procured goods at the correct quantity and with the correct documentation				
	Warehouse implements modern filling system that enables it to easily provide any information upon request.				
	Warehouse adopt a distribution system which is reliable enough to know the status of all the distributed goods to project offices.				
Flexibility	Amref's warehouse management system allows quick and easy mapping for unexpected goods shipping request.				
	Warehouse smoothly distribute goods to multiple projects correctly as per the provided information.				
	Warehouse continuously experience, learn and improve its practice to improve its service delivery				
Responsiveness	Items stays in transit warehouse for unnecessary longer time before they shipped to the project offices.				
	Warehouse proactively send information to project offices about shipment of goods as it dispatched from country office.				
	Warehouse timely report the status of the delivered goods to the users and suppliers and take necessary action on damaged or lost goods.				
Fleet Management					
Reliability	The transport unit control the transporters for the delivery of the goods to project offices without delay.				
	The transport unit send the goods with complete and correct transportation and dispatching documents.				
	The fleet management has a mechanism to ensure the safe arrival of all the shipped goods both in terms of quality and quantity.				
Flexibility	Fleet is flexible enough to accommodate unexpected and sudden increases and decreases in freight volumes than the initially requested quantity.				
	Fleet has a capacity to negotiate with transport service provider for timely replacement of damaged rental vehicles.				
	Fleet continuously experience, learn and improve its practice to improve the transport service provision.				
Responsiveness	Amref has sufficient transporters who can respond for urgent transport needs for the transportation of commodities from country office to projects				
	Fleet update requesters about the status of the shipped goods on a regular manner				
	Amref's transport service providers is capable enough to respond for the organization urgent transport need in short notice.				

Information and Communication					
Reliability	There is no frequent information communication interruption in Amref that affects the supply chain function.				
	Adoption of ICT improves the supply chain service in documentation accuracy.				
	Adoption of ICT contributes to the cost minimization of the total supply chain expense.				
Flexibility	Exchange of information takes place frequently, informally and/or in a timely manner.				
	The ICT implementation improves the ability of the supply chain to rapidly adjust its capacity in response to customer demand.				
	Amref continuously experiment, learn and improve its practice to advance the supply chain service delivery in terms of speed and quality.				
Responsiveness	Adopting ICT in Amref increases the timely information sharing with project offices in all supply chain processes.				
	The ICT system increases the performance of the supply chain by improving up the delivery speed.				
	ICT helps to improve the supply chain efficiency in terms of delivering information, to the correct place, at the correct time.				

Part III. FACTORS AFFECTING SUPPLY CHAIN PERFORMANCE OF AMREF HEALTH AFRICA

Please indicate the degree to which you agree with the following factors affecting the supply chain performance of Amref health Africa in Ethiopia.

No.	Organizational Internal Factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1	Humanitarian supply chain performance of Amref is affected by unavailability of adequate funding.					
2	Humanitarian supply chain performance of Amref is affected by budget unavailability which is committed for the supply chain.					
3	Amrfe's supply chain performance affected by unavailability of a trained and experienced supply chain staffs which resulted from the poor recruiting mechanism.					
4	Amref's supply chain service performance affected by the limitation of hiring enough supply chain staffs.					

5	Unavailability of updated supply chain policy restrict the supply chain performance to deliver the expected service.					
6	The inconsistency in application of the supply chain procedures by all staffs affected the supply chain performance.					
7	Lack of coordination among the supply chain partners affects the organization supply chain performance.					
8	Lack of managerial commitment specifically affects the supply chain performance.					
9	Organizational culture resistance to change by employees affected the supply chain performance.					
Governmental Situational Factors						
1	Unavailability of joint planning practice with other partners when setting the supply chain planning affects the supply chain performance of Amref.					
2	Lack of an overall inter-agency coordination and collaboration in humanitarian supply chain affects the organization operational performance.					
3	Lack of assistance from the government bodies affects the organization's humanitarian operation performance.					
4	Government restrictions or bureaucracy in the supply chain affected the supply chain performance of Amref.					
Infrastructure Situational Factors						
1	Unavailability of all-weather alternative roads to communities negatively affected the delivery of relief (aid) goods.					
2	Lack of adequate ICT networking infrastructure affect the efficiency of the organization supply chain service.					
3	Unavailability of warehouses at the project office areas and near beneficiary locations affect the supply chain performance of Amref.					
Socio-economic Situational Factors						
1	Cultural restrictions or norms negatively affects Amref supply chain operational performance.					
2	Inability of local suppliers to understand purchase request or purchase order or specifications affect Amref's supply chain operational performance.					
3	The unreliability of local suppliers affect the organization's supply chain operational performance.					
4	Unavailability of quality goods in local market affect the organization's supply chain operational performance.					
5	Absence of potential local suppliers affect the organization supply chain operational performance.					

If there are other factors which you think is not captured in the above internal and external factors please describe below.

- Factors which highly affects the supply chain performance of Amref:

Thank you!

APPENDIX: II

Reliability

Scale: Supply chain Reliability

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

	Cronbach's Alpha Based on Standardi zed Items	N of Items
Cronbach's Alpha	.848	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Varianc e if Item Deleted	Correct ed Item- Total Correlati on	Square d Multiple Correlat ion	Cronbac h's Alpha if Item Deleted
Procurement deliver requests within the agreed lead time	44.6500	28.555	.636	.760	.828
There is accuracy of documentation management practice	44.7000	29.379	.546	.663	.834
Procurement deliver as per the ordered quality and quantity	44.7500	29.039	.613	.711	.830
Warehouse distribute goods at the correct quantity and documentation	44.8500	29.818	.564	.700	.834
Warehouse implements modern filling system to information provision	44.6000	34.358	-.011	.580	.861
Warehouse adopt reliable system to know status of distributed goods	44.6500	29.397	.528	.645	.835
Transport control the transporters for delivery of goods without delay	45.0500	27.839	.547	.710	.835
Transport send goods with complete and correct documents	45.1500	27.608	.635	.872	.827

Fleet management has mechanism to ensure safe arrival of goods	44.9000	30.832	.392	.821	.844
No frequent information communication interruption in the SC	44.8000	29.642	.447	.569	.842
ICT improves supply chain service documentation accuracy	45.0000	27.474	.707	.776	.821
ICT contributes to the cost minimization of the total SC expense	44.8000	28.905	.487	.653	.839

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
48.9000	34.516	5.87501	12

Reliability

Scale: Supply chain Flexibility

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.853	.846	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Procurement accommodate quantity adjustment after PO	44.9000	28.726	.768	.816	.825
Procurement maintain relationship with suppliers	44.9500	31.208	.469	.726	.846
Procurement experience learn and improve its practice	44.9500	29.945	.629	.613	.835
Warehouse allows quick and easy mapping for unexpected shipments	45.0500	30.576	.595	.723	.838
Warehouse smoothly distribute goods to multiple projects correctly	44.7000	35.168	.064	.610	.864
Warehouse continuously experience learn and improve its practice	44.9000	30.516	.539	.580	.841
Fleet is flexible to accommodate unexpected freight volume change	45.3000	28.853	.564	.659	.840
Fleet is capable to negotiate with transporters for vehicles replacement	45.4000	28.568	.660	.892	.831
Fleet continuously experience learn and improve its practice	45.1500	32.029	.397	.774	.850
Exchange of information takes place frequently, informally and timely	45.0500	31.208	.408	.687	.850
ICT improves ability of supply chain to rapidly response	45.2500	28.829	.684	.738	.830
ICT continuously experiment, learn and improve its practice	45.0500	30.366	.460	.665	.847

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
49.1500	35.818	5.98485	12

Reliability

Scale: Supply chain Responsiveness

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.770	.786	12

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Procurement deliver the goods and services in shorter lead time	42.6500	27.608	.494	.796	.747
Procurement ensures replacement of goods rejected by requester	42.8500	28.029	.447	.584	.751
Procurement is capable enough to respond for volatile demands	42.7500	26.618	.598	.820	.736
Items stays in transit warehouse for unnecessary longer time	43.5000	29.421	.141	.363	.786
Warehouse send information to project office about goods shipment	43.1000	30.832	.012	.412	.800
Warehouse report the status of the delivered goods to users and supplier	43.3500	27.713	.338	.725	.762
Amref has sufficient transporters to respond urgent transport needs	43.1000	27.042	.382	.573	.757
Fleet update requesters about the status of the shipped goods regularly	42.9500	24.471	.730	.816	.715

Amref transporters respond urgent transport need in short notice	43.1500	27.924	.310	.243	.765
ICT increases timely information sharing with project offices	42.9000	26.305	.585	.681	.736
ICT increases performance of SC by improving delivery speed	43.1000	26.095	.569	.793	.736
ICT improve in delivering information to correct place and time	43.0500	26.787	.502	.711	.744

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
46.9500	31.945	5.65197	12

Reliability

Scale: Organizational Factor

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.945	.945	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Unavailability of adequate funding	31.7500	37.355	.541		.951
Budget unavailability committed for SC	31.7500	35.355	.694		.943
Unavailability of trained and experienced staffs	31.8000	36.379	.668		.944
Limitation of hiring enough SC staffs	32.0000	33.789	.900		.932
Unavailability of updated SC policy	31.9500	33.734	.935		.930
Inconsistency by staff in application procedures	31.7500	35.355	.694		.943
Lack of coordination among SC partners	32.0000	33.789	.900		.932
Lack of managerial commitment	31.9500	33.418	.898		.932
Organizational culture resistance to change	31.8500	33.818	.848		.935

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
35.8500	43.713	6.61159	9

Reliability

Scale: Governmental Factor

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.834	.838	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Unavailability of joint planning with partners	12.0500	4.682	.682	.795	.782
Lack of inter-agency coordination & collaboration	12.2500	4.618	.704	.535	.773
Lack of assistance from government bodies	12.0500	4.997	.514	.395	.859
Government restrictions or bureaucracy	12.1000	4.516	.777	.822	.741

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
16.1500	7.924	2.81490	4

Reliability

Scale: Infrastructural Factor

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.878	.881	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Unavailability of all-weather alternative roads	7.9500	2.471	.900	.947	.707
Lack of adequate ICT networking infrastructure	7.7500	2.934	.590	.434	.983
Unavailability of warehouses at project office areas	8.0000	2.526	.832	.940	.767

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
11.8500	5.608	2.36810	3

Reliability Scale: Socio-Economic Factor

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	0.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.954	.955	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Cultural restrictions or norms	15.7500	10.408	.955		.929
Inability of local suppliers to understand PR or PO	15.7000	10.537	.959		.929
Unreliability of local suppliers	15.5000	12.053	.582		.992
Unavailability of quality goods in local market	15.7500	10.408	.955		.929
Absence of potential local suppliers	15.7000	10.221	.946		.930

Scale Statistics

Mean	Variance	Std. Deviation	N of Items
19.6000	16.568	4.07043	5