

**A FRAMEWORK TO MEASURE  
SUPPLY CHAIN MANAGEMENT EFFICACY  
IN HUMANITARIAN SUPPLY ENVIRONMENTS**

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by

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## PREFACE

I dedicated some years of my career to Humanitarian Supply Chain Management, endeavouring to positively impact the lives of the less fortunate who find themselves living at the bottom of the income pyramid. I joined World Vision International's (WVI) Global Supply Chain Management (GSCM) team in 2008 and retired from WVI in 2013 as the Global Director for Supply Chain Management. WVI GSCM's mandate was to work alongside the programming offices in various countries where WVI had presence for the purpose of enhancing the supply chain management (SCM) capabilities. Our team concluded a SCM assessment towards the end of 2009 in World Vision's Haiti programme. We had a follow up work session via WebEx scheduled with the National Director of World Vision Haiti, and whilst preparing for this meeting the afternoon of January 12, 2010 CNN news channel reported that Haiti suffered a devastating earthquake of a 7.3 magnitude (according to Oxfam) on the Richter scale. Haiti as a country and the people of Haiti as a community was just not equipped for such a disaster. The people, processes, systems, infrastructure, economy and support systems could not cope with the magnitude of what had happened. The aftermath of this event (and many other interventions in frontier economies and failed states during my time as a humanitarian supply chain management operative) made a profound impact on my perspectives of developing a framework of metrics to measure the efficacy of humanitarian supply chain management in frontier economies and failed states in order to gauge preparedness for some level of self-sufficiency and self-respect during huge scale misfortune.

Imagine the supply chain scale, scope and complexities involved in preparing for the soccer world cup (SWC) of 2010. Now imagine the supply chain management complexities of the SWC, starting the next day without prior notice in a region where the infrastructure may be underdeveloped. Although this research and thesis is not about emergency response logistics per se, but rather about the impact that permanent humanitarian supply chain management will have on the efficacy of humanitarian programming and development, one can draw much learning from large events in developing countries where humanitarian actors perform their daily calling. Developing communities, infrastructure and systems are the key. Hence, the need to raise the bar

of infrastructure and self-sustainability in these markets to cope during hardship. The prognosis being postulated that communities with well-developed micro and market economies are more resilient and capable during a response to large scale interventions of hardship. This study is not about the large scale disaster logistics responses but rather about humanitarian programming and development enabling communities and countries to respond to slow onset disasters such as underdevelopment of people, processes and infrastructure with dignity and self-respect.

My sincere appreciation goes to my study leader, Professor Koot Pieterse for his gentle guidance and deep insight. I also want to extend my appreciation to the many research partners all over the world as well as Dries Brunt for his value adding language editing. I hasten to thank Dr Annelie Pretorius for her most professional support and continuous encouragement. I wish to recognise many colleagues over the years, too many to mention from whom I learnt everything I know. I also wish to recognise the research participants for their time and insight as well as the three external examiners for their constructive comments.

The preface would not be complete without acknowledging God almighty for the many blessings and opportunities throughout my life. Last but not the least, I wish to thank my wife Renske and our children PJ and Christine for their love, support and tolerance over many years, especially during those years whilst I was absent from the family, traveling the globe in search of understanding the issues at hand in an attempt to offer value adding solutions.

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## EXECUTIVE SUMMARY

Supply chain management in the for-profit commercial environment is a broad, far-reaching field of study, impacting on a society's standard of living. Commercial supply chain management is the science of balancing customer service levels with least total costs. In other words, the for-profit supply chain management practitioner is concerned with customer service levels, consumer value, shareholder value, total cost optimisation and ultimately maximising long term sustainable return on investment. Commercial supply chain management differs from military supply chain management in that the latter also focuses on service delivery, but the cost is almost irrelevant. In military operations, successful results (winning the battle) far surpass the total cost parameter or the return on investment. One of the major differentiating factors between commercial supply chain management (CSCM) in the for-profit theatre and humanitarian supply chain management (HSCM) in the not-for-profit supply environments hinges on strategic intent and how to measure success. In CSCM, return on investment (ROI) is key and in HSCM, the ability to create impact becomes paramount.

Regarding spend, both CSCM and HSCM are concerned with optimising operational spend, optimal utilisation of capital goods and infrastructure as well as minimising the cost of goods, works and services. Commercial supply chain managers want to spend as little as possible on operational expenses similarly to their humanitarian counterparts but humanitarian supply chain managers are also concerned about underspending of donor funded programming.

Humanitarian programming often happens under difficult and dangerous circumstances. This requires a special cadre of professionals who are willing to serve the most vulnerable without exploitation and are able to deliver value often with limited or even broken infrastructure, unreliable supply and under insecure conditions. Humanitarian supply chain management leadership requires a



balanced approach between long term strategic views whilst managing the short term outcomes. Also, humanitarian leadership needs to balance decision-making between long term strategic interventions and the ability, maturity and cost structures at functional and executional levels. This conundrum is the fundamental difference between commercial supply chain management and humanitarian supply chain management. Once one understands and respects these nuances, one can measure performance and reward appropriate corrective behaviour. Zig Ziglar once said: *“If you aim at nothing, you will hit it every time”*. The question that has been asked for so long has been “how to measure supply chain management efficacy in humanitarian supply environments?” This study addresses this question of developing a framework to measure supply chain efficacy in humanitarian supply environments with the view to create an enabling environment within which service levels could enhance the impact of donor funding whilst the needs of intended beneficiaries are better served.

During field research, ten key focus areas and sixty-five supply chain management elements were identified. These sixty-five elements were tested via two surveys making use of the Delphi technique. Four of the sixty-five SCM elements were eliminated following the second survey due to high disagreement between the respondents, and a further two were eliminated based on expert opinion feedback from the respondents leaving fifty-nine elements being significantly important for inclusion in the framework. Three additional elements were identified by the respondents but not empirically verified and therefore not included in the proposed frameworks but could be included in future research.

Fifty-seven of the sixty-five elements can be directly controlled by the SCM function. However, four of these fifty-seven elements were eliminated during the second survey and a further two were eliminated reviewing the feedback from respondents leaving fifty-one elements under the direct control of the SCM function.

Of these fifty one elements, forty-three were rated as having a high impact on risk mitigation and would hence be more suited to developing supply chain management organisations focusing on reduction of audit findings and risk aversion.

Of the same fifty-one elements under the direct control of the SCM function, eight were rated as having low impact on risk mitigation and would hence be more suited for mature supply chain organisations focusing on adding value as strategic business partners to an NGO office as part of their C suite.

A further eight elements were rated as not being under the direct control of the SCM function. However, these eight elements were rated as significantly important on superior execution of humanitarian programming and impact on donor confidence. Hence, these elements would not be included in the proposed frameworks but will be included in this cross functional list of elements that needs to be coordinated between functions.

Future research of key performance metrics and benchmark performance standards may be of some value, but the actual benchmark levels may vary too much between organisations and may not be value adding.

Another future research topic that may add great value would be to develop a diagnostic management tool that can gauge the 'state or condition' of a humanitarian organisation's supply chain and offer commensurate solutions to facilitate not only continuous but also focused step change interventions.

The practical implementation of the required metrics in such a dynamic area as the supply chain industry needs to focus on the metrics for each indicator, and develop a model for SC performance in aspects most required at particular times or context and environment, depending on the varying levels of market

activities. The model should be a broader than balanced scorecard or other frameworks currently in use.

Lastly, future research in humanitarian supply chain efficacy could include identification on how best to reward and/or recognise good performance in humanitarian supply environment.

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# PART 1: INTRODUCTION TO THE RESEARCH

## CHAPTER 1: INTRODUCTION

### 1.1 Introduction to the research and background information

Management combines the processes of planning, organising, leading and control. This research will focus on the control function of management as well as the feedback mechanism closing the continuous improvement cycle. Key Focus Areas (KFAs) and commensurate Key Performance Indicators (KPIs) need to be defined to measure Supply Chain Management efficacy. Oxford Dictionary and Thesaurus (2001) defines efficacy as “the ability to produce the intended result”. Once the performance results in the key focus areas are quantifiably measured as part of the control function of management, feedback mechanisms will set in motion the use of best practice corrective actions when trigger levels are violated, enhancing the planning and organising functions of management to lead the management improvement process. It would be of real value if a diagnostic management tool can be developed to gauge the ‘state or condition’ of a humanitarian organisation’s supply chain.

Supply Chain Management (SCM) is part of Business Management science. The Council for Supply Chain Management Professionals (CSCMP) defines SCM as follows:

*“Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies.”* (CSCMP, 2007)

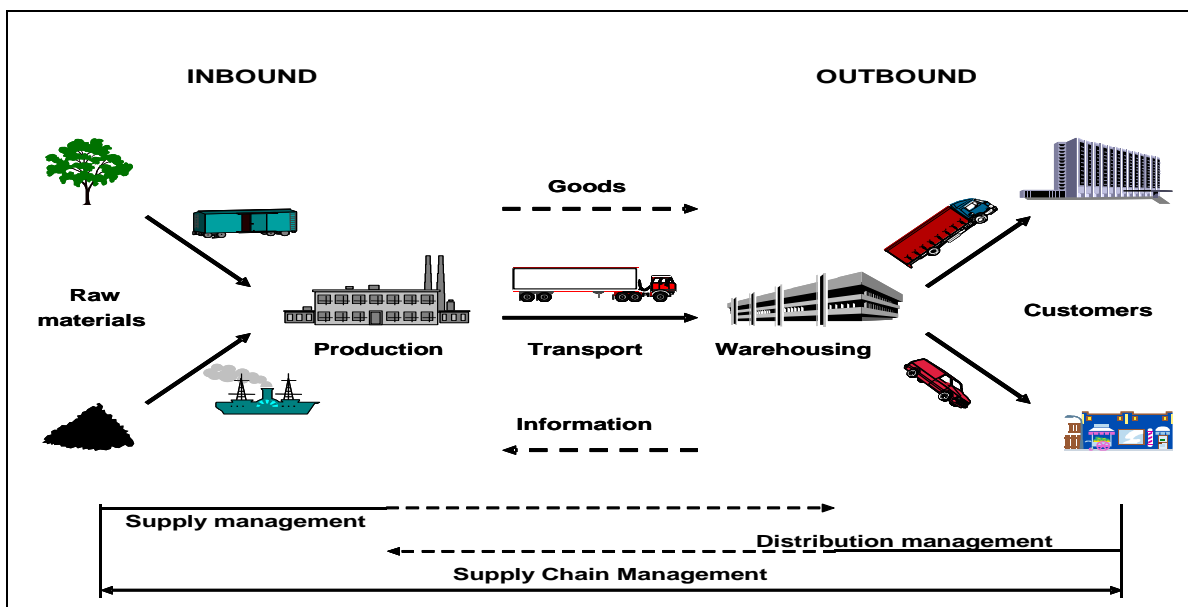


The CSCMP (2007) also adds the following boundaries and relationships to the definition of Supply Chain Management:

*“Supply Chain Management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the Logistics Management activities noted above, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance and information technology.”*

It is possible to depict the CSCMP’s definition of Supply Chain Management in Figure 1.1.

**FIGURE 1.1: Depiction of the SCM scope and definition**



SOURCE: De Villiers, G. (2008)

Disasters are unpredictable. It is not known when, where and to what magnitude disasters will happen. However, the only certainty is that natural disasters will happen and appropriate responses will be required. The management challenge is to measure the efficacy of such a response. Droughts, floods, earthquakes,

volcanic eruptions, hurricanes, terrorist attacks and political crises are causes of disasters, according to Van Wassenhove (2006). Van Wassenhove (2006) defines a *disaster* as “a disruption that physically affects a system as a whole and threatens its priorities and goals”. Some disasters are sudden-onset such as earthquakes, and others are slow onset such as droughts. Disasters can also be natural such as earthquakes or man-made such as terrorist attacks. Refer to Figure 1.2 for Van Wassenhove’s (2006) matrix of disaster classification.

**FIGURE 1.2: Disaster classification matrix**

	Natural	Man-made
Sudden-onset	Earthquake Hurricane Tornado	•Terrorist attack •Coup d’Etat •Chemical leak
Slow-onset	•Famine •Drought •Poverty	•Political crisis •Refugee crisis

SOURCE: Van Wassenhove (2006)

Van Wassenhove (2006) builds on the concept that private sector logistics and supply chain management principles can and should be applied to improve the performance of disaster logistics. With this in mind, Van Wassenhove discussed the complexities of managing supply chains in humanitarian settings. Van Wassenhove goes on to outline strategies for better preparedness and need for supply chains to be agile, adaptable and aligned. In addition to this, humanitarians have come under additional pressure to prove to donors, pledging millions in aid and goods, that they are reaching the needs of the

intended beneficiaries. Humanitarian organisations are becoming more results-oriented as they are held more accountable, therefore their operations must be more transparent. Van Wassenhove concludes stating “since disaster relief is 80% logistics, it would follow then that the only way to achieve this is through slick, efficient and effective logistics operations and more precisely, supply chain management”.

Currently, humanitarian supply chain management organisations rely on commercial supply chain management metrics to measure efficacy. Although there are similarities, there are also some perceived critical differences and peculiarities that need research and clarification. Performance management is critical in any organisation, as it enables the organisation to determine where they want to go, where they are at present and how they are progressing to where they want to be. Performance management and measurement helps justify programs and their costs also communication internally and externally between organisations and stakeholders. It improves the management and delivery of products and services.

The following list supports the compelling notion why management science researchers need to also research humanitarian supply chain performance management:

Performance measurement is relevant because:

- One needs to measure in order to manage.
- Feedback to donors/sponsors on yield to intended beneficiary of the donor dollar is important.
- Funding and resources are severely limited, hence the need to manage lean supply chain channels, free of waste, especially during slow-onset disasters such as perpetuating famine.
- During sudden onset large scale disasters, funding is often more readily available especially during the time during which the international news

channels cover the event(s). (This period is also informally referred to as the “CNN moment” amongst some humanitarian actors.) Speed of response is the objective under these circumstances with its own set of performance metrics, however, emergency response logistics falls outside of the scope of this research.

Humanitarian supply chain metrics differs from commercial settings in that;

- The value proposition is significantly different than the commercial equivalents. In commercial supply chains, investors demand a return on investment (ROI). In humanitarian supply chains, donors demand transparency, efficient governance and yield to beneficiary amongst other metrics still to be confirmed through this research paper.
- Lack of visibility in humanitarian settings is arguably one of the biggest differences. In commercial settings, performance is tracked and reported virtually through a myriad of business cubes on many platforms. In the commercial industry, thought leaders postulated one can manage a business from the moon given the data visibility. This is not the case just as yet in the humanitarian supply chain eco system.

Gustavsson (2003) stated humanitarian relief organisations were “establishing global and/or regional pre-positioning units capable of delivering critical emergency supplies, materials, vehicles and technical assistance to any place in the world within a short time frame”. Gustavsson omitted to research how much inventory should be pre-positioned and where inventory control points ought to be located. He listed the gaps in Non-Governmental Organisation (NGO) capacity as:

- Lack of in-depth knowledge.
- Funding biased towards short term responses.
- Lack of investment in technology and communication.

Gustavsson (2003) went on to recommend competency based capacity building initiatives, higher degree of collaboration across agencies, broadening of the scope of donor funding to include investment in supply chain management, exploring the use of goods-in kind, and investment in technology and communications, but he omitted to mention the need for measuring performance.

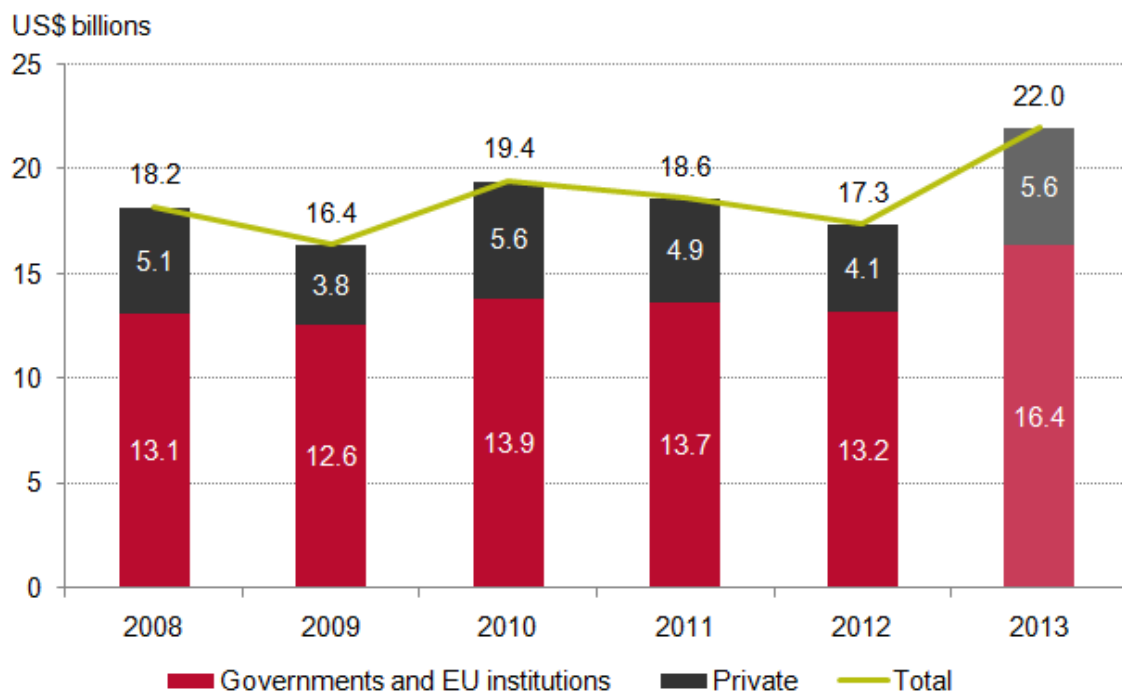
## 1.2 Purpose of this research

Publications and literature reviews of the humanitarian supply eco system is littered with evidence supporting the need to measure supply chain management efficacy. Christopher and Tatham (2011:1) quotes the UN Secretary General's report to the General Assembly of the United Nations dated 28 May 2009 stating "The global demand for humanitarian assistance, including requests for assistance by national governments, continues to rise. This is triggered and sustained by increasing severity of natural hazards, escalating conflicts, and a dramatic increase in vulnerabilities caused by the global financial crisis, continuing high food prices, the scarcity of energy and water, population growth and urbanisation"

Christopher and Tatham (2011:2) continue by quoting: "recent estimates suggest that as much as 80% of the expenditure of aid agencies spent is on logistics. The Council for Supply Chain Management Professionals (CSCMP, 2012) corroborates this perspective by stating that their field study research initiatives estimates that between 60-80 percent of the expenditures of aid agencies is under the heading of logistics. The World Conference on Disaster Reduction in Japan in January 2005, called for *"better preparedness for disaster relief in natural disasters, but being better prepared can also mitigate the effects of man-made disasters. In addition to this, humanitarians have also come under increasing pressure to prove to donors, pledging millions in aid and goods, that they are reaching those in need. Since donors are becoming more aware when*

*it comes to expenses, humanitarian organizations are under greater scrutiny to monitor the impact of aid, not just the input and output but the whole operation. This means they must be more results-oriented as they become ever more accountable and therefore their operations must be more transparent. Since disaster relief is about 80% logistics it would follow then that the only way to achieve this is through slick, efficient and effective logistics operations and more precisely, supply chain management. Therefore, just as the science of logistics and supply chain management has become critically important for private sector logisticians, so too it is becoming more important for humanitarians” according to the Blackett Memorial lecture (n.d.) delivered at Insead.*

**FIGURE 1.3: International humanitarian assistance trend**



SOURCE: Blackett Memorial Lecture (n.d.)

Given that the overall annual expenditure of such agencies is in the order of US \$22 billion, the resultant logistics expenditure of some US-\$15 billion provides a

huge opportunity for improvement, and consequential benefit to those affected by disasters.”

International humanitarian assistance rose to a record US\$22 billion in 2013, in response to an extraordinary scale of crises and needs. This is a stark change from 2012, which saw a slight decline in funding amid no major new disasters. Both public and private funding increased. Government donors accounted for three quarters of the international response, contributing US\$16.4 billion, up 24% from 2012. Contributions from private sources, individuals, trusts, foundations and corporations also rose steeply to an estimated US\$5.6 billion in 2013, up 35% from 2012. A large part of the increase in 2013 – US\$4.7 billion in funding – was directed to the responses in Syria and refugee-hosting neighbouring countries according to OCHA. Yet, this rise in global funding was still not enough to meet the scale of humanitarian needs according to Global Humanitarian Assistants.

World Vision International (2007) reported about 25 000 people die daily of malnutrition and related causes. The World Vision report continues by stating that in the past decade, 3 billion people were affected by climate related disasters and 24.5 million people were displaced in 52 countries during 2006. Kessler (2013:11) states around half of the African continent’s almost one billion people live on less than US\$ 1.25 per day and almost 240 million people are affected by chronic hunger. Kessler (2013:11) continues by saying following the 60 years of independence, sub-Saharan Africa states have made advances in democratisation but they will mostly fail to meet one of the United Nation’s Millennium Development Goals namely to half the number of people affected by hunger and poverty by 2015. (Kessler. 2013:11). Kessler goes on to state: “Estimates suggest that in the last 50 years one trillion US Dollars has been invested in Africa’s battle against hunger, disease, water shortages and poverty.” It follows logically that the magnitude of the humanitarian issues at hand are immense, the value of the investment is also

high and time is of the essence. Why then are nations and the world at large so slow to address these compelling humanitarian needs or issues? One could postulate a scenario that the world at large and the donor community more specifically do not have confidence in the efficacy of the humanitarian supply eco system.

The Global Hunger Index (GHI) ranks countries on a 100-point scale in which zero is the best score (no hunger) and 100 the worst, although neither of these extremes is reached in practice. The 2012 GHI is calculated for 120 countries for which data on the three components are available and for which measuring hunger is considered most relevant. (The GHI calculation excludes some higher-income countries because the prevalence of hunger there is very low.) Refer figure 1.4 for a comparison of the GHI index of 1990, 1996 and 2012. . Figure 1.4 also depicts the under-five mortality rate, prevalence of underweight children and the proportion of the undernourished population.

Easterly and Pfuze (2008) state that “Foreign aid from official sources to developing countries (excluding private aid) amounted to \$103.6 billion in 2006”. They go on to argue that there have been fierce debates over how effective this aid has been or could have been.

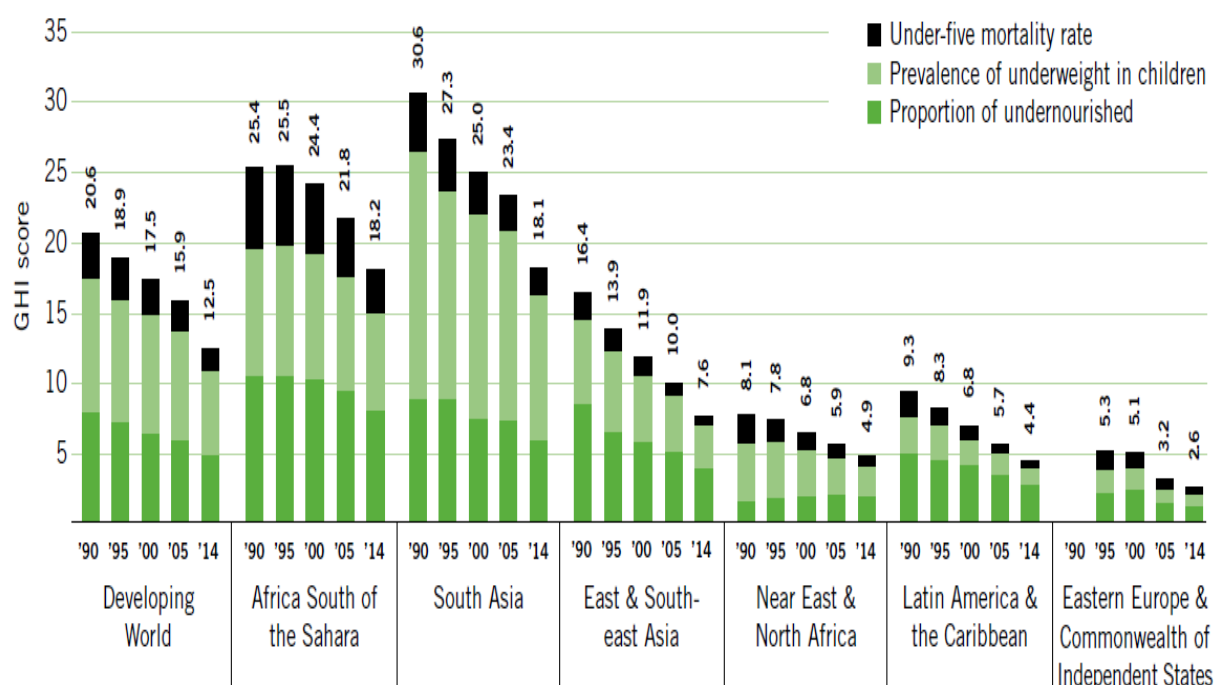
From the above paragraphs, it is clear the need for humanitarian programming is huge. According to Christopher and Tatham (2011:1) “even if world peace would break out tomorrow, the reality is that an increasing population (and individuals’ associated rising expectations) is putting enormous pressure on the world’s resources and on the generic infrastructure supporting them.” Research sources indicate no shortage of investment in humanitarian supply. However, the investments do not seem to have a significant impact on the standard of living as equated to the Global Hunger Index. Although some improvements over the 32 year reporting period can be seen, much more needs to be achieved. There are multiple frameworks and metrics measuring the results and



outcomes of programming. However, the efficacy of programming is not measured and ineffectiveness and inefficiencies are henceforth difficult to diagnose. The purpose of this research is to establish appropriate key performance indicators that can measure the efficacy of supply chain management in humanitarian supply environments.

**FIGURE 1.4: Comparison of the 1990 GHI, 1996 GHI and 2013 GHI by region**

FIGURE 2.1 CONTRIBUTION OF COMPONENTS TO 1990, 1995, 2000, 2005, AND 2014 GLOBAL HUNGER INDEX SCORES, BY REGION



Note: For the 1990 GHI, data on the proportion of undernourished are for 1990–1992; data on child underweight are for the year closest to 1990 in the period 1988–1992 for which data are available; and data on child mortality are for 1990. For the 1995 GHI, data on the proportion of undernourished are for 1994–1996; data on child underweight are for the year closest to 1995 in the period 1993–1997 for which data are available; and data on child mortality are for 1995. For the 2000 GHI, data on the proportion of undernourished are for 1999–2001; data on child underweight are for the year closest to 2000 in the period 1998–2002 for which data are available; and data on child mortality are for 2000. For the 2005 GHI, data on the proportion of undernourished are for 2004–2006; data on child underweight are for the year closest to 2005 in the period 2003–2007 for which data are available; and data on child mortality are for 2005. For the 2014 GHI, data on the proportion of undernourished are for 2011–2013, data on child underweight are for the latest year in the period 2009–2013 for which data are available, and data on child mortality are for 2012.

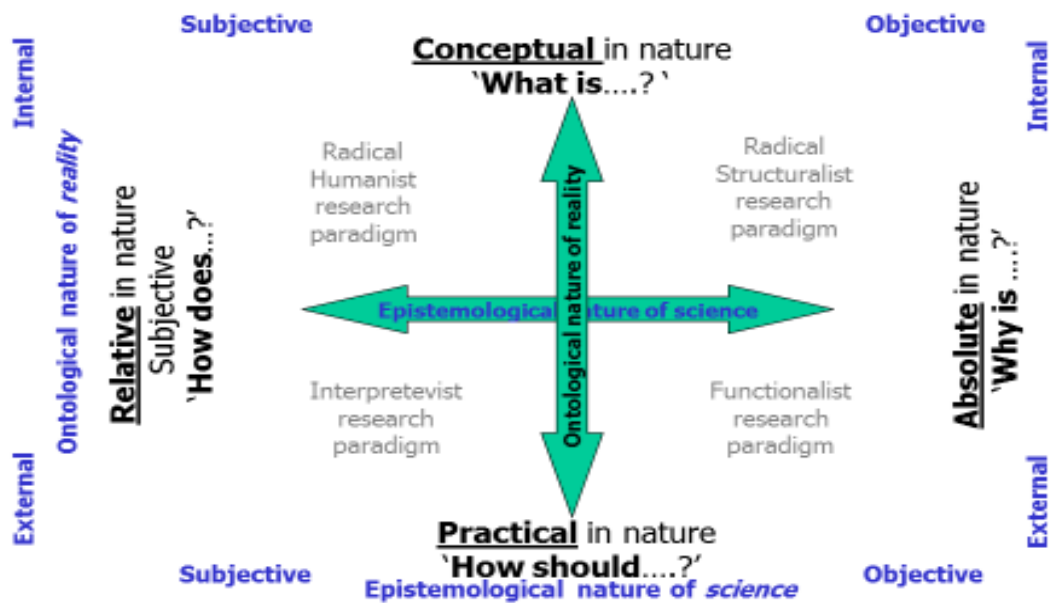
SOURCE: 2014 Global Hunger Index (The challenge of hidden hunger)

### 1.3 Primary and secondary research objectives

Doctor of Philosophy (PhD.) research tends to be more academic, theoretical and philosophical in nature whereas a Doctor in Business Administration (DBA)

research focuses more on contributions to business practice. This research will be focusing on the “*practical nature*” of “*how should*” one measure or “*what framework*” would measure supply chain management efficacy in humanitarian supply environments. It will use both “*interpretivist research*” by asking humanitarian supply chain management thought leaders about their experiential preferences through structured engagements as well as “*functionalist research*” by statistically evaluating the correlation and validity of the questionnaires. Refer figure 1.5 for a depiction of how the interpretivist research paradigm will be dealt with between the external ontological nature of reality and the functionalist research paradigm through challenging the “why is” of the external and internal environments.

**FIGURE 1.5: A conceptual framework that can be used as a basis for theorising**



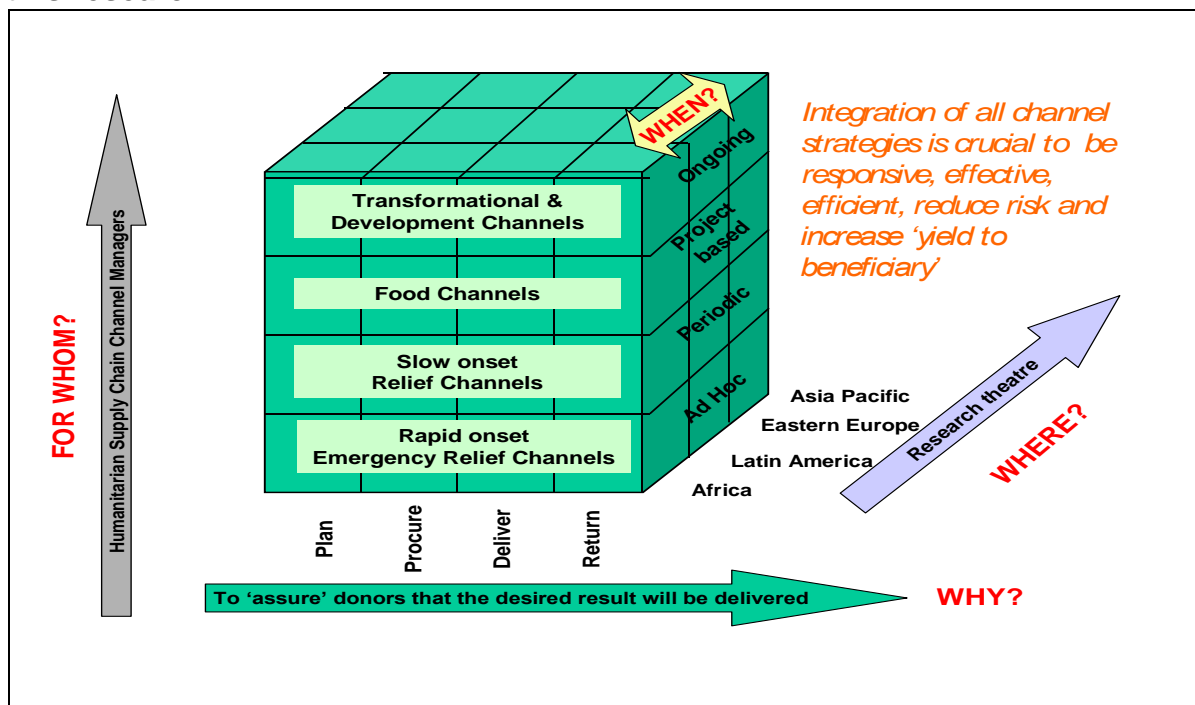
SOURCE: Burrell & Morgan (1979)

### 1.3.1 Primary research objective

The primary purpose of this study is to develop a new framework (what) for humanitarian supply chain managers (whom) to measure a supply chain's efficacy. Supply chain "efficacy" includes supply chain management elements of effectiveness, efficiency, seamless integration between functions and business processes to continuously deliver the intended results (why).

The scope of the research will cover humanitarian supply chain management developing economies (where). The research will be focusing on (what) drives supply chain management efficacy outside of sudden onset disaster incidents (when). Refer to Figure 1.6 for a synthesis of the 'what' – 'whom' – 'why' - 'where' – 'when' of this study.

**FIGURE 1.6: Synthesis of the 'what' – 'whom' – 'why' - 'where' – 'when' of this research**



SOURCE: Developed by World Vision Supply Chain Leadership, adapted by the author for the purposes of this study.

### **1.3.2 Secondary research objective**

The secondary research objective is to empirically test which supply chain management elements could be grouped into key focus areas?

### **1.4 Research question**

The primary research question is: “What framework can be used to measure supply chain management efficacy in a humanitarian supply environment in the most effective way?”

### **1.5 Research methodology**

The overall objective of this research is to study what instrument(s) can measure supply chain efficacy in the most effective way. This study intends to combine quantitative and qualitative methods. According to Mangan, Lalwani and Gardner (2004), better insights in the field of logistics research can be obtained if one combines quantitative and qualitative methods.

Structured questionnaires are envisaged to be completed by about thirty humanitarian supply chain management thought leaders, from across the world. These questionnaires will follow a structured interview format which will be conducted to gain insight into which aspects of humanitarian supply chain management are critical to be measured during slow on-set disasters and prolonged relief and development support such as for droughts. A mixture of open questions as well as specific structured questions will be used. The results from this first phase of research will be used during the formulation of a specific set of key focus areas and supply chain management elements that need to be measured.

This newly developed framework of key supply chain elements will be tested during a second round of debates with the same thought leaders, using the Delphi technique as described by Hsu and Sandford (2007). These KPIs will then be grouped into key focus areas, applicable to specific functions within a humanitarian supply chain and appropriate levels of management, with commensurate benchmarked trigger levels.

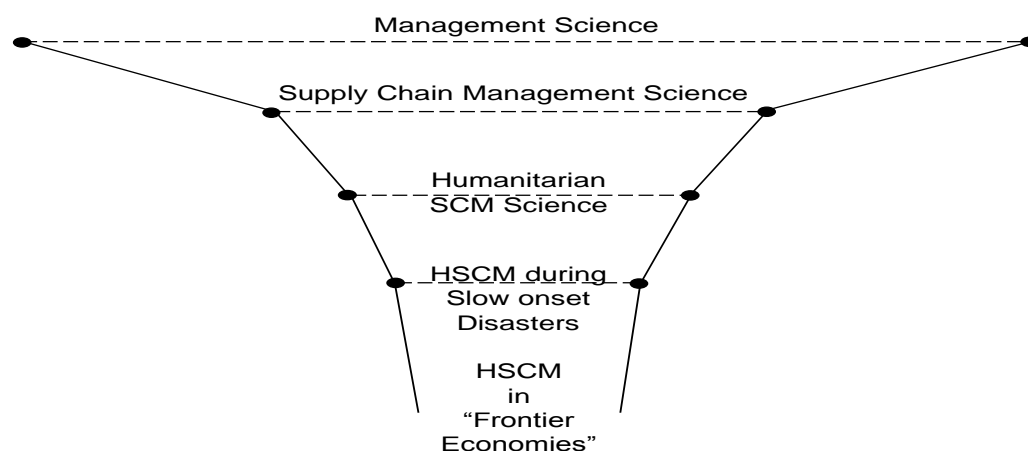
The **Delphi method** is a structured communication technique, originally developed as a systematic, forecasting method that relies on a panel of experts. The experts answer questionnaires in two or more rounds. After each round, a facilitator provides an anonymous summary of the experts' forecasts from the previous round as well as the reasons they provided for their judgments. Thus, experts are encouraged to revise their earlier answers in light of the replies of other members of their panel. It is believed that during this process the range of the answers will decrease and the group will converge towards the "correct" answer. Finally, the process is stopped after a pre-defined stop criterion (e.g. number of rounds, duration of time between empirical research rounds, achievement of consensus and stability of results) and the mean or scores of the final rounds determine the results. Delphi is based on the principle that forecasts (or decisions) from a structured group of individuals are more accurate than those from unstructured groups.

## **1.6 The location, scope and delimitation of the research**

The scope of this study will be focusing on narrowing Business and Economic Management science down to Supply Chain Management science, to Humanitarian Supply Chain Management science, to Humanitarian Supply Chain Management science in humanitarian development programs in emerging economies. The scope of emergency logistics responses following rapid on-set disasters are excluded from this study. Refer Figure 1.7 for a depiction of the location and delimitation of the research from *management science* to

*humanitarian supply chain management* in the context of humanitarian development in frontier economies.

**FIGURE 1.7: Location and delimitation of the research**



SOURCE: Developed by the author for the purposes of this research

## 1.7 Overview of the study layout

The following paragraphs describe the research on a chapter-by-chapter basis. It is envisaged that the text will comprise of three parts and seven chapters as detailed in Table 1.1

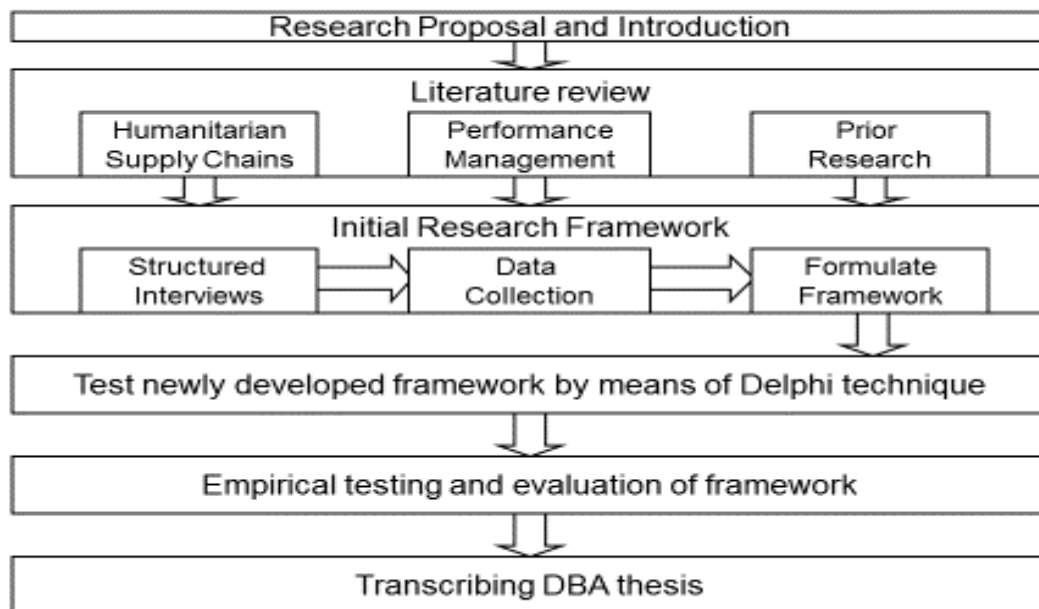
**TABLE 1.1: Layout of chapters**

Chapter number	
<b>Part I – Introduction to the research</b>	
Chapter One	Introduction
<b>Part II – Literature review: Clarification of the concepts</b>	
Chapter Two	Supply chain management in humanitarian context
Chapter Three	Metrics and performance management

<b>Part III – Empirical testing of research</b>	
Chapter Four	Research framework
Chapter Five	Data collection and analysis
Chapter Six	Research results
<b>Part IV – Conclusion</b>	
Chapter Seven	Summary and conclusions

Figure 1.8 is a flow chart depicting the research structure, indicating the anticipated sequential steps that will be followed during this research.

**FIGURE 1.8: Research structure**



SOURCE: Developed by the author for the purposes of this research

### 1.7.1 Supply chain management in humanitarian context

In chapter two, the unique context of supply chain management in the humanitarian context will be analysed. It is necessary to lay out a sound

foundation with regard to the nuances of supply chain management in the humanitarian industry in order to understand the domain or management Eco System.

The Humanitarian or aid sector eco system evolved over recent years. The major eco systems influencing the humanitarian sector are; Governments, United Nations, Civil Society, Multilaterals, the Military, the Private Sector and the Media. These seven large, compound and complex eco systems now make up the world of interacting “mega-communities” in which the Aid Industry does its business. Supply chain management in the humanitarian context now finds itself in this new set of realities.

There are roughly 5,000 non-governmental organizations, according to Humanitarian Outcomes, a firm that researches humanitarian assistance. The sector is rapidly professionalizing. International Medical Corps' growth mirrors the growth of the aid industry. In 1984, when the NGO started work, it was comprised of a handful of volunteer doctors and nurses who travelled to Afghanistan to treat the wounded. Now, it employs nearly 5,000 people in 30 countries and will implement \$300 million in program services this year alone according to Marketplace.org. All this to say, supply chain management in the humanitarian context now finds itself in this new set of realities that shape who and what we are and what we need to become if we are to add value, make a meaningful contribution and be relevant by the end of the coming decade in what sometimes is referred to as “Destination 2020”.

Other factors like Global Mega Trends which includes Climate Change, Globalisation, Economic Crisis, Food Crisis, Inter-faith relations, energy and trade and others, have also impacted the humanitarian sector resulting in the need to be far more scientific and sophisticated. While the humanitarian industry is fraught with the multitude of current mega issues, one must establish leadership and systems that will give an organisation the capability and vision



to not only be relevant by 2020, but to be a world-class leader in the field. This will require that we do things differently than in previous decades. Times are changing and the modern donor will insist on far more innovative practices and much more accountable governance. It will also require that we adopt a far more collaborative posture. It will also require that we move these sorts of behaviours from peripheral activities to core business functions that are adequately capitalized by both people and finance.

The Humanitarian industry is funded primarily through Government Grants, Humanitarian Organisations, and Non-Governmental organisational, corporate and private donors. Donors generally do not require a return on investment but insist on exceptional business process rigor and corporate governance when working with donations.

According to van Wassenhove (2006) Chapter 7, *“Falling out of favour is the notion that just giving cash and in-kind donations to support humanitarian relief efforts is enough. Companies today are considering marrying short-term relief actions with longer-term disaster response partnerships with the humanitarian sector. When successful, these partnerships have the potential to exploit the core competencies of both business and humanitarian organisations. They can also act as an effective forum for the exchange of information, ideas, and best practices that can improve efficiency. Partnerships also have the potential to deliver fast, effective support during a crisis and can help build capacity between disasters. Given the potential rewards of cross-sector links, they are attracting increasing attention from both the corporate and the humanitarian sectors. Humanitarian organisations are now recognising that businesses have more to offer in terms of resources, expertise and technology. As a result, they are becoming more open to discussions with the private sector and in some instances are identifying their partners and making the first approach.”*

*An increasing number of companies believe these partnerships are also a visible means of demonstrating to their shareholders, employees, customers, vendors and local communities that they actively subscribe to the concept of social responsibility.*

*Unlike the private sector, humanitarian organizations are specialists in being agile and adaptable, implementing complex supply chains under high levels of uncertainty with limited resources and infrastructure. Private logistics companies increasingly participate in partnerships with humanitarian organizations, approaching the latter not only with charitable intent but as an opportunity for learning and business development.”*

Bernard Chomilier, former Head of Logistics at the IFRC, explains that “*To be prepared, humanitarians need to work not only during disasters but more importantly, between disasters, developing agreements and establishing policies and processes to operate swiftly during disasters with existing as well as new supply chain partners.*”

### **1.7.2 Performance management**

**In chapter three**, the concept of performance management will be analysed as well as the impact that measuring performance management could have on supply chain efficacy.

The primary goal of supply chain management efficacy is to optimise service levels and spend in all aspects of the supply chain so that more resources may reach the intended beneficiaries. During a recent research project lead by IBM (2010:13), it was found that the five most critical key focus areas for supply chain management are:

- Cost Containment;
- risk;

- globalisation;
- visibility and;
- customer satisfaction.

It is critical to maintain focus on Industry Standards and emulate best practices without reinventing the wheel for supply chain management in the humanitarian context.

### **1.7.3 Initial research framework**

**In chapter four**, the research framework will be discussed. Research instruments that can measure supply chain efficacy has traditionally focused mainly on commercial supply chain management, and significant research gaps are still evident regarding what instruments can measure supply chain efficacy in the humanitarian and non-profit environments.

It is important for this study to be done in order for Humanitarian Supply Chain Management agencies, Non-Governmental Organisations, Non-Profit organisations and service providers to have the diagnostic ability to measure a supply chain's maturity, readiness, capability and related risks. Humanitarian relief organisations need to know the nature of potential and actual demand and its readiness to respond efficiently and effectively. Failing to do this study will result in management not having quantitative and qualitative indicators to identify opportunities to save more lives, to improve 'cash to beneficiary' or impact.

Most reward systems are based on functional achievement. To facilitate internal process integration, new measures and frameworks must be developed. Traditional measurement and reward systems often make cross-functional coordination difficult. Measurement systems typically mirror organisation structure. Managers must be encouraged to view specific functions as

contributing to a process rather than a stand-alone performance. A function may, at times, have to absorb increased cost for the sake of achieving lower total cost. Unless a measurement and reward system is in place that does not penalise managers who absorb cost, integration will remain more theory than practice.

Interviews will be held with humanitarian supply chain managers, from across the world. These interviews will serve as the first round of qualitative research. The purpose of these interviews will be to gain insight into aspects of preparedness for slow on-set disasters and disasters that could last for long times such as droughts. The output of these interviews will inform the design of the research questionnaire and the grouping of the supply chain management elements into key focus areas.

#### **1.7.4 Data collection and analysis**

**In chapter five**, the data collection methodologies, questionnaires and data analysis techniques will be discussed. It is envisaged that data will be collected via face to face interviews, telephonic interviews and / or video conferences with supply chain managers from a broad sample of developing economies.

Once the data is analysed, two separate groups of debates, using the Delphi technique will evaluate the formulation of a framework that may be used to measure supply chain management efficacy.

#### **1.7.5 Research results**

**In chapter six**, the study will analyse the correlation between the proposed framework and the research results. The literature research will be followed by structured interviews. These structured interviews and data collection will inform the formulation of an emerging framework of key performance areas and key

performance indicators. This framework will be empirically tested leading to the documentation of case studies confirming examples and evidence where the newly developed framework has indeed contributed towards supply chain management efficacy.

### **1.7.6 Summary and conclusions**

According to General Gus Pagonis (2008), US Army General responsible for logistics in Operations 'Desert Shield' and 'Desert Storm' leading organisations tend to have both a distinctive operating model and high-performance execution model. The execution component implies a need for metrics. This research will focus on the perspective that for a supply chain to be excellent, management must be able to differentiate between appropriate metrics for different supply chain strategies. Supporting the need for measuring supply chain performance, Pagonis, postulated that Supply Chain Executives must know:

- What are the qualitative business goals?
- What are the quantitative supply chain objectives?
- How are they doing?
- What is best practice to improve the situation?

**Chapter seven** will conclude the research by summarising the findings and conclusions. This will be followed with an overall conclusion on the contribution that 'a framework to measure supply change management' could make towards 'supply chain management efficacy'.

Lastly, limitations of this research and future research opportunities will be discussed.

## **PART 2: LITERATURE REVIEW: CLARIFICATION OF CONCEPTS**

### **CHAPTER 2: SUPPLY CHAIN MANAGEMENT IN HUMANITARIAN CONTEXT**

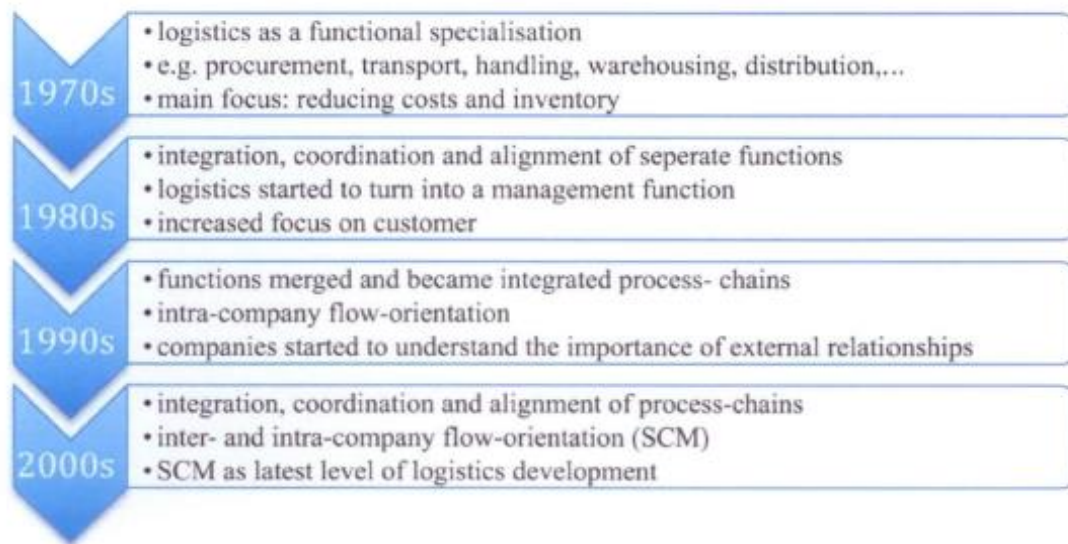
#### **2.1 Introduction**

This chapter focuses on defining supply chain management and contrast the differences between the commercial (for-profit) domain and the humanitarian (not-for-profit) domain. During the course of this study, the author will refer to the for-profit domain as commercial supply chain management (CSCM) and to the not-for-profit domain as humanitarian supply chain management (HSCM). Supply chain management is a complex discipline that seeks to integrate and synthesise simultaneously and in real time between a myriad of tasks, activities, disciplines and functions. In this chapter, the unique context of supply chain management in the humanitarian context will be analysed.

The Humanitarian or aid sector of the macro economy evolved over many years but gained momentum in recent years, more so following the massive 2004 Boxing Day Indian Ocean earthquake and South Asian tsunami. No tsunami warning systems were in place and people were taken by surprise. According to Google, this tsunami affected 18 countries, left 1.7 million people homeless killing 250 000 people. This led to arguably one of the largest humanitarian supply chain management responses in history. Geohazards International argues “death and suffering from natural disasters is preventable”. They continue by arguing “People in poor and emerging economies are far more likely to die in natural disasters than people in wealthy countries, and the impact of disasters is escalating. Why? Their communities face rapidly growing urban populations, unchecked developments, lags in safety and technical expertise, and the priority of meeting basic daily needs rather than long-term needs, according to Geohazards. This argument by Geohazards International

supports the notion that preparedness, including supply chain management preparedness will enhance the resilience of a community to optimise their response to episodes of harm by being more resilient and capable of responding to large scale interventions of hardship. To best illustrate this point, Geohazards International continues by stating that “A comparison of earthquake fatalities alone illustrates the tragic toll. Haiti’s Magnitude 7.0 earthquake in 2010 killed 223,000 people and accounted for most earthquake deaths in the world that year. Much of the suffering could have been prevented. There were 22 earthquakes of equal or greater strength in 2010, including a Magnitude 8.8 in Chile. However, Chile had instituted a robust safety program that saved many lives.” Only one person died during the Chilean earthquake. As stated in chapter one, the purpose of this research is to study supply chain management focusing on developing resilience in developing communities.

It’s hard to imagine life in western society without logistics. Logistics is an important tool that enables businesses to satisfy customer demand. Short delivery times, meeting specific requirements to customise products, and optimal inventory management are some of the challenges logistics has to meet. Because of challenges such as interventions of hardship as stated above, the logistics function cannot afford to be a follower of events. Improving market performance is not just a challenge for the marketing function alone. Similarly, enhancing the supply of products is not just a purchasing problem alone, nor is the turnover rate of capital tied up in inventory merely a problem concerning finance. This broadening of the scope of logistics has resulted in boundaries fading between functional areas in organisations. Figure 2.1 depicts the developmental path of logistics from its historical perspective.

**FIGURE 2.1: The evolution of logistics as management tasks**

SOURCE: Baumgarten 2008a, p.14

Ackermann and Van Bodegraven (2007: 8) state that the development of supply chain management evolved through several stages over five decades. They postulate that activities such as warehousing and transportation were not integrated prior to 1963, until the formation of the National Council of Physical Distribution Management (NCPDM). In 1985, the NCPDM became the Council for Logistics Management (CLM), and in 2004, CLM became the Council for Supply Chain Management Professionals (CSCMP). Ackermann and van Bodegraven (2007: 11) conclude by stating that “*ultimately, Supply Chain Management is all about increasing shareholder value, improving profitability, support revenue and market share performance*”.

Arguably, the first documented evidence of logistics is in the bible (Genesis 41) where Joseph interpreted Pharaoh’s dream to store corn during the seven years of plenty for consumption and trading, even international trading, during the seven years of famine. Kessler, (2013) states the first discourse over the term “business logistics” was initiated by Bowersox in 1964 (Stabenau 2008). Until



then the term logistics had been used mainly in a military context as a collective term for the tasks to support troops (Koether 2011b, p.21; Pfohl 2000, p.11). In a business context the main areas were flow of materials and transport technology. In the first phase of academic work on logistics, investigations concentrated on distribution as a decisive element aimed mainly at achieving the marketing goals of readiness capabilities and delivery time (Attwood 1971; Planning a distribution system; Bretzke 2008; Mentzer et al. 2001; Vahrenkamp 2007).

Thus up to the 1970's logistics was reduced to the basic functions of transportation transshipment, warehousing, packaging and order picking. It was considered a subordinate offshoot within the individual functional sectors of an enterprise, such as procurement, production or distribution and its only task was to ensure the availability of materials and goods within the production process (Baumgarten 2008a, p.13; Baumgarten and Thoms 2002).

In the 1980s new production methods like Just-in-Time, which were initially used predominantly in the Japanese automotive industry, led to recognition of the consequent loss of interfaces and the integration role of logistics (Wildemann 2008, p.164-5). In the course of continued development, this integrative view spread to the other operational areas, such as procurement, distribution and sales, and led to organisation-wide thinking in processes and process chains, with the customer as the starting point and business services as the endpoint (Baumgarten and Zadek 2000). Alongside this development, there was also an increasing move towards a holistic consideration of the flows of goods, information and finance.

Upon emergence of the concept of supply chain management (SCM) in the next development phase, logistics became an important inter functional tool for the planning, management and control of whole supply chains, which in the course of globalisation have increasingly advanced to global networks. The removal of

trade barriers, the liberalisation of markets and the reducing of transport and communication costs have further encouraged the development of multinational companies with value-added activities across the globe (Baumgarten 2008a, p.17). In the process logistics was both a driver and a beneficiary.

As a management function logistics offers further optimisation potential for increasingly complex and global networks. Sectorial thinking is still firmly anchored in any branches and companies and estimates in this area see further productivity potential of three to five percent on average (Stabenau 2008, p.28). In conjunction with a long-term annual growth of world trade by five per cent per annum and transport increasing by seven percent per annum, logistics remains a dynamic growth market.

However in view of a globalised economy, demands are increasing for global social responsibility (Baumgarten 2008b). Aspects such as sustainability, environmental tolerability and safety are becoming more relevant alongside economic criteria. Another important field of action for logistics in terms of social responsibility providing for people caught up in permanent and acute disasters. This relatively new subsector of logistics is called humanitarian logistics.

With expansion of its fields of activity and responsibility, logistics was accepted as an application-based scientific discipline. Logistics analyses and shapes specialised economic systems as flows of objects (particularly goods and people) in networks through space and time and provides recommendations on their design and implementation. The primary economic issues of logistics thus relate to the configuration, organisation, operation and monitoring of these networks and flows with a view to enabling progress in the balanced achievement of economic, ecological and social goals (Delfmann et al. 2010, p.3). Bretzke (2008, P.38) illustrates this definition of logistics with a metaphor and compares the network to a “river bed”, whole material flow represent the currents flowing through the river bed.

Due to the extent and dynamics of the influence factors and design parameters, the analysis, optimisation and design of logistics systems and networks is a highly complex issue. Various players, such as suppliers, shipping agents, logistics service providers or consignees, participate in logistics networks with what can be diverging interests. In addition, logistics systems consists of a number of nodal elements, such as production sites, sea and inland ports warehouses, hubs, collection and distribution centres and various interfaces which link the nodes together via various means of transport (Feige 2010, p.101). Over the course of time the complexity of logistics networks has also increased due to the progressively international distribution of work and locations and general product diversification (Bretzke 2008, p.2) and henceforth relies on a complex set of measures as reflected in the multitude of metrics that has been the topic of many publications. To conclude, there are many common processes and best practices shared between business logistics, military logistics, manufacturing logistics, commercial supply chain management and humanitarian supply chain management. However, defining success in each of these disciplines requires a specific and unique set of metrics.

One of the main questions that needs to be answered refers to the major distinctions between humanitarian supply chain management (HSCM) and that of commercial supply chain management (CSCM).

## **2.2 Distinction from commercial supply chain management**

The supply chain management (SCM) profession has continued to change and evolve to fit the needs of the growing global supply chain community. With the supply chain covering a broad range of disciplines, the definition of what is a supply chain can be unclear. Often times SCM can be confused with the term logistics management. It is prudent at this point to agree the definitions of supply

chain management and logistics management as defined by the Council for Supply Chain Management Professionals (CSCMP).

**Definition of Supply Chain Management:** *“Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.”*

**Boundaries and Relationships in Supply Chain Management:** *“Supply chain management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted in the definition, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance, and information technology.”*

**Definition of Logistics Management:** *“Logistics management is that part of supply chain management process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.”*

**Boundaries and Relationships in Logistics Management:** *“Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfilment, logistics network design, inventory control, and management of third party logistics services providers. It is involved in all levels of planning and execution--strategic, operational and tactical.”*

In an unpublished manuscript by Gerard de Villiers, previous Chief Logistics Officer at World Vision International, he stated that humanitarian logistics and supply chain management is not different in concept from commercial supply chain management but the theatre of deployment, is different, the implementation poses different complexities due to the scale and number of stakeholders involved, and the metrics defining success varies vastly. Christopher and Tatham (2011:33) define **Humanitarian Supply Chain Management** as “*the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods, materials, and money, as well as related information from the point of origin to the point of consumption for the purpose of alleviating the suffering of valuable people. (Thomas and Kopczak, 2005:2)* ”. They go on to say “*logistics plays a very important role in humanitarian supply chains and accounts for a large percentage of the costs. Reducing inefficiencies in humanitarian logistics operations can, hence lead to large cost savings.*” It is important to note Christopher and Tatham’s statement that “logistics plays an important role in humanitarian supply chains” confirms their agreement with many thought leaders that supply chain management is the overall all-encompassing function and logistics management, albeit emergency logistics management in this context is a subset of humanitarian supply chain management.

The global demand for humanitarian assistance, including requests for assistance by national governments continues to rise. This is triggered and sustained by increased severity of natural hazards, escalating conflict, and a dramatic increase in vulnerabilities caused by global financial crisis, continuing high food costs, scarcity of energy and water, population growth and urbanisation. Just like with commercial supply chain management, the humanitarian focus is fundamentally also on sourcing and movement of materials at the most effective and sufficient way as well as the provision of services. However, the added complexity of humanitarian supply chain management is the unpredictable nature of where the next disaster, being slow-

onset, rapid-onset, natural or man-made, will occur. We are certain that disasters will occur, but the unpredictable nature of where and when rapid onset events will occur as well as the unknown magnitude of the intervention differentiates HSCM from CSCM.

Another complexity hinges around the infrastructure that by implication may be rendered unserviceable following disasters. The infrastructure may be unsafe or unserviceable for many reasons, which complicates or sometime even eliminates the opportunity to source locally. This may impact again on the cost to serve, the length of the supply chain, prolonged response times, and the lack of goods or services to serve those in need. The knock-on effect of this could increase the stress on the dysfunction of infrastructure such as ports, airports, roads, government systems such as customs offices as well as on local suppliers. One parallel with commercial supply chain management is the lack of price elasticity. When the demand goes up, prices go up as well, just as in the commercial world during times of scarcity.

The cost of failure in CSCM results in poor returns on investment and could even lead to job losses and poverty. However, failure in HSCM often times results in unnecessary loss of life, not really those lives lost during the initial disaster but loss of life of the surviving victims.

Humanitarian supply chains are under increasing scrutiny from donors and grant providers. The modern donor requires more transparency and wants aid agencies to be accountable to donors for spending funds wisely. The tension for aid agencies lies in the trade-off between saving lives and good governance. They could rely on good systems and process rigour to fully comply to donor requirements, but may be perceived to be lethargic in their response. The beneficiaries are interested in staying alive, but often does not have much of a say in what they are going to receive. Hence, it is up to the aid agencies to predetermine cultural appropriateness of relief responses and relief items. Think

of the complexity of the implications of food and sanitation type relief items in different cultures and religions. In CSCM, the marketers can do research and provide appropriate solutions to the various cultures. When a customer does not need or want a product or service, they simply buy something which fulfil their needs but they do not starve or become sick because of inappropriate foodstuffs or goods.

Overspend of budget is important to both CSCM and HSCM as it pertains to overhead expenditure budget, but in HSCM, underspend on programming is a huge issue that could be viewed similarly to underspend of capital equipment in CSCM.

Tomasini and van Wassenhove (2009:9) list the following factors as unique characteristics of humanitarian supply chain management:

- Ambiguous objectives;
- limited resources;
- high uncertainty (in time and place);
- urgency (intensity measured by the product of time and available resources); and
- politicised environments.

Tomasini and van Wassenhove (2009:9 to 11) go on justifying that **objectives are ambiguous** or possibly confusing in the sense they believe it is difficult to assess the level of commitment of the different role players and their relationship to one another, as humanitarian operations typically roll out with large numbers of stakeholders varying from donors, relief agencies, media representatives and beneficiaries. In the commercial supply chain environment, stakeholders will be aligned around their respective profit incentives. In other words, if there is not financial benefit for a stakeholder, they will withdraw their participation. They continue to argue that **limited resources** are

disproportionately allocated between the various role players. Heavy physical and emotional demands are placed on a limited pool of qualified and willing **human resources** leading to high staff turnover. Lack of funding or late funding impacts negatively on **capital resources**. **Infrastructure** is often damaged, not maintained or under developed depending on the nature of the programming. Dependence on assessments and dynamic changes in supply and demand, mixed with a significant inability to assess the quality and number of role players contributes to high uncertainty. This research does not aim to focus on emergency responses following rapid onset disasters. Therefore, the acute speed and intensity is not of the essence of this research but rather the cost effectiveness and cost efficiency of the supply chain in support of programming. However, humanitarian supply chain operations are **highly politicised** all the way from receiving of donations to deployment of relief programming in the field.

Kessler (2013:20) articulates the following distinctions between humanitarian supply chain management from what he refers to as business logistics. “*The customer is not the starting and endpoint of the supply chain. Instead at the beginning of the supply chain are the donors and at the end the beneficiary (Baumgarten et al. 2010; 455; Oloruntoba and Gray 2006: 2009).*” Kessler continues to argue there is no development of demand in the classic sense through the needs of the customer. Instead, the needs are identified or assessed by a humanitarian organisation. (Kovacs and Spens 2007:107).

In terms of goals, Kessler believes that in business, companies aim to satisfy the customer through quality, service levels and efficient processes, and thus be profitable, whereas in the humanitarian supply chain, the goal is the reduction or prevention of starvation, malnutrition, illness or death. “*This distinction results in a particular problem since humanitarian supply chains involve commercial partners, such as suppliers of food and non-food items or logistics services provider, who are dependent upon commercial success. Humanitarian logistics is thus faced with a conflict between the monetary goals of the commercial*



*sector and the non-monetary goals of the humanitarian sector. (Baumgarten et al 2010: 456)”, according to Kessler. Kessler (2013:20) continues stating “in addition, distinctions arise from the developmental time lag of humanitarian logistics in comparison to business logistics.”*

*This time lag is estimated by some authors at ten to twenty years (Gustavsson 2003; Rickard 2003; van Wassenhove 2006) and is expressed either in a lack of institutional anchoring of logistics within the aid agencies or the organisation of logistics departments into levels of operational hierarchy (Thomas and Kopczak 2005). Often the operational sectors in aid agencies are totally separate from one another, as was standard in companies when the development of business logistics first began (Pettit and Beresford 2009).”*

Lastly, Kessler (2009;:20) states “*the short term nature and operational bias of logistics projects in aid agencies, which means that humanitarian logistics tends to assume more the character of a fire fighter than a strategic problem solution (van Wassenhove 2006).”*

### **2.3 The influence of funding types and structures**

In commercial organisations, supply chain management is funded from operational expenses. It is generally accepted that superior supply chain management capability leads to competitive advantage. Some commercial organisations run their supply chains as profit centres. Funding and in particular, levels of funding plays a critical role in all supply chain management environments, but in humanitarian supply chains, funding, a senior executive mandate, standardised practises and skills sets are cardinal to success or failure. Christopher and Tatham (2013:33) state “*funding directly and indirectly affect the scope, speed, effectiveness and efficiency of disaster response.*” This can be extrapolated to both emergency and non-emergency disaster responses. Christopher and Tatham (2013:37) also state, “*Private donation levels are*

*strongly impacted by the amount and type of news coverage (Bennett and Kottasz, 2000; Tomasini and van Wassenhove, 2009). The 2004 Indian Ocean earthquake and tsunami, for example, led to a huge response from the donor community while other emergencies that were neglected by media received fewer resources.*” Therefore, often times, non-emergency responses which are also relief responses or humanitarian development programming under conditions of slow on-set disasters receives less media exposure and subsequently less funding. Christopher and Tatham go on to state “*despite their importance, constraints imposed by funding systems are often not considered in models of humanitarian supply chains*”. There is hence an interdependence between financial flows and material flows. Jahre and Heigh, (2008) published a research paper “*Does the current constraints in funding promote failure in humanitarian supply chains?*” They postulate the efficiency of a supply chain is directly affected by the funding mechanism that is employed. They also discuss how changing the way donors act could radically improve the way support is delivered, and they explore the impact of that support for those affected.

Funding may take the form of **grants**, **sponsorship**, or **donations** of cash and/or **donations** of resources (people resources, in-kind goods or in-kind services). “*In recent years, contributions from foundations, individual donors and private sector increased in importance (Thomas and Kopczak, 2005; Kovacs and Spence, 2007)*”, according to Christopher and Tatham (2013:25).

**Grants** are allocated by a multitude of grantors, mostly for the purpose of funding community development programming, preparedness interventions and for specific research or design interventions. There could be many other permutations pertaining to grants. Grants normally have specific grant conditions that need to be adhered to. Jahre and Heigh, (2008) quote the following statement: “*A closer look reveals that the solution to improving the effectiveness of these supply chains may not be in the hands of these supply chain operators at all. What is less often reported are the underlying contributing*

*factors to delivery failures. 'We have received new pledges of 580 million dollars', UN emergency relief coordinator Jan Egeland (2007) told journalists. However, officials emphasised that it was not clear how much of the new pledges were earmarked for the world body's 456 million Euro appeal for emergency relief aid to the earthquake over the next six months or whether the donation could also be used for other efforts including long-term reconstruction. This type of confusion, reported from the same earthquake, is typical of donor funding patterns and models, and causes massive uncertainty and competition between agencies, particularly for their supply chains. This comes at a time when clarity and coordination are already in short supply".* ([http://www.terradaily.com/reports/\\$580M\\_Aid\\_Pledges\\_For\\_Pakistan\\_Sow\\_Confusion\\_For\\_UN.html](http://www.terradaily.com/reports/$580M_Aid_Pledges_For_Pakistan_Sow_Confusion_For_UN.html)).

Jahre and Heigh, (2008) go on to say “*We have identified papers on aspects such as how disaster relief is viewed separately from development and how some projects, e.g. schools, are favoured over other infrastructures such as roads, ports, and sewage (e.g. Donahue & Joyce, 2001; de Waal, 2004; Hackl & Druckner, 2006; Rowat & Seabright, 2006, Manfredo & Schultz, 2007, Pande & Pande, 2007) but no research focuses on the link between logistics and funding. The challenge of short- term earmarked donations has been highlighted, (Gustavsson, 2003; Thomas & Kopczak, 2005; Oloruntoba & Gray, 2006; Altinger et al. 2008), as well as problems of unwanted or inappropriate supplies (Economist Intelligence Unit, 2005).*” From a donor and public point of view, relief agencies often appear as if they have the funds and access to respond quickly. A closer look reveals that the solution to improving the effectiveness of these supply chains may not be in the hands of these supply chain operators at all. What is less often reported are the underlying contributing factors to delivery failures, such as the structuring and conditions of funding for example.

Some relief organisations rely on **sponsorships** for part of their funding. Sponsorships for example can be in the form of a corporate donor

demonstrating an interest in a water project in a specific location. The corporate donor would then donate an amount of cash (on a monthly or once off basis) or goods-in-kind (on a once off or regular basis), but the sponsor does not get involved in the operational execution of the supply chain or the relief programming at the coal face. Through some not-for-profit organisations a sponsor can “adopt” a child or a “programme” under the umbrella of sponsorship. The donor would then receive feedback from the child or community on the impact of their sponsorship.

**Donations** can take the form of cash donations, gift-in-kind donations, services-in-kind donations and resources in kind donations. Christopher and Tatham (2013:35) state *“providers of aid include international agencies, local non-governmental originations (NGOs and community based organisations (Oloruntoba and Gray, 2006)). International aid agencies can be divided into three categories: entities operating under the United Nations umbrella, international originations such as the International Federation of the Red Cross and Red Crescent Movement (IFRC), and global NGOs (Thomas and Kopczak, 2005)”*.

Donors decide on how their funds are used. This is referred to as structuring of funding. Donors also decide on restrictions such as how much of the funding may be used for administrative costs in an attempt to maximise the percentage of donor funds that reaches beneficiaries also sometimes described as “cash to beneficiary”.

Easterly and Pfuze (2008:17) quote three types of structured aid namely **tied aid**, **food aid** and **technical assistance**. They continued by stating *“Tied aid comes with the requirement that a certain percentage of the goods has to come from the donor country, which makes the recipient likely to be overcharged since it increase the market power of the donor countries suppliers. Food aid is similar in that it consists mostly of in-kind provisions of foods by a donor country,*

*which could almost be purchased much cheaper locally. Food aid is essentially a way for high income countries to dump excess agricultural production on markets in low income countries. **Technical assistance**, according to OECD is defined as activities whose primary purpose is to augment the level of knowledge, skills, technical know-how or productive aptitudes of the population of developing countries. It is often tied and often condemned as reflecting on donor rather than beneficiary priorities”.*

Easterly and Pfuze (2008:10) state that aid effort is split between many donors and many agencies. They go on to argue that not only are there too many agencies, but these many agencies try to programme in too many countries that could lead to reduced effectiveness. On page 11, Easterly and Pfuze quote “so few dollars, so many agencies” leading to increasing competition between relief originations for funds and increased demand for accountability from donors. Furthermore, donors do require more accountability resulting in more robust governance and increasingly complex reporting requirements.

When looking at supply chain funding, it is important to understand that responding organisations supply to and generally run not one but three types of supply chains according to Jahre and Heigh (2008) namely the i) **Permanent Supply Chain**, the ii) **Emergency Supply Chain** and the iii) **Project Supply Chain**. Organisations need a **Permanent Supply Chain** in order to be responsive in highly volatile circumstances with a considerable number of variables and to standardise as many processes and activities as possible. This standardisation cannot occur in the middle of an emergency and therefore must be carried out proactively. In general, this will take the form of permanent supply platforms, usually based in the regions to reduce lead times. These structures consist of the following key supply chain elements namely i) infrastructure in the form of a set of offices and depots that hold prepositioned stocks and coordinate procurement and framework contracts for resources and transport; ii) process development where common roles, responsibilities, and actions for supply chain

response are designed and materials for training local and regional logisticians are produced; iii) personnel composed of management, technical, and training positions, bolstered with specialist technical teams that can be deployed at very short notice; and iv) systems used to initiate, track, and replenish resources as well as provide information to make management decisions and report back to donors. This supply chain is generally predictable and stable, and demand figures can be used to plan resources.

**The Emergency Supply Chain** depends on the resources available in the disaster area, specialist teams are usually deployed to help set up all supply chain activities. This can include mobilisation of resources; customs clearance; warehouse, transport, and helicopter operations; procurement; fleet service; recruitment; and training. These supply chains are usually set up in days and can be active for a few weeks or many months at a time. This supply chain is generally unpredictable and unstable; demand figures cannot be used to plan resources.

**The Project Supply Chain** is usually set up in the recovery phase of a disaster or to develop some resources in preparation for a possible event, the project supply chain is essentially a locally managed set of resources that provide a service similar to that of a commercial service provider, against which costs are recovered. This supply chain is generally predictable and stable, but requires local presence and market understanding of the integrating company.

Present funding models can be both long and short term (commonly seen as development and emergency response respectively), which are further divided into tied (earmarked) and untied (un-earmarked) donations depending on the stipulation of the donor, often on political grounds. Figure 2.2 shows how funding types have developed since 2002 in the IFRC.

**TABLE 2.1 – Funding of the three different types of supply chain**

Supply chain	Preferred funding	Merits and constraints
Permanent	Can be tied or untied long term	Funding can be planned and managed to maintain a stable support platform. Minimises the cost of setting up the emergency supply chain and supports the project supply chain. Requires investments but provides less visible results.
Emergency	Untied short term	Funding required immediately but with maximum flexibility. Can be spent quickly. Provides, in conjunction with permanent, fast, effective assistance. Provides short-term opportunities for donor visibility.
Project	Tied or untied long or short term	Depending on the project, as long as the permanent supply chain is available to support the project supply chain set up, any funding mechanism can be accommodated. Becomes very expensive unless a permanent chain is in place.

SOURCE: Jahre and Heigh, 2008.

Generally, there is little funding for the purpose of planning and managing permanent supply chains to maintain a stable support platform. The consequence is high competition for what is available, a lack of preparedness resulting in an inability to support the project supply chain. Furthermore, funding of project supply chains depends entirely on the project because the permanent supply chain is unavailable to support its set up, leading to projects being outsourced with resulting failures and/or very high costs.

As supply chain management constitutes such a high share of the total cost, it is puzzling that donors do not show more interest in supply chains of humanitarian aid. The aftermath of the Tsunami in 2004 sadly illustrated that 'all the money in the world' does not help in the provision of sufficient disaster response when one is not well prepared: 'We were hit by three disasters in succession. First came the earthquake, then the Tsunami and finally the relief agencies.' (Words of an interlocutor in Indonesia during a Tsunami review [IFRC, 2005])

According to Walker and Pepper (2007:16), funding is a fundamental issue. Doctors always prescribe medicine, teachers provide education and lawyers provide litigation. Aid agencies are no different. Food aid providers have a

propensity to offer the solution of food aid and health providers look to medical solutions. Donors frequently make decisions independent of consultation with each other, and collective efforts to pool funding and make joint decisions regarding needs assessment are frequently viewed as inefficient and counter-intuitive to rapid service delivery. Therefore, perhaps one answer entails donors enhancing their own coordination to complement operational agencies devising mechanisms for them?

Funding cycles (unlike development aid) are unrealistically short for many donors. Funding mechanisms are critically limited by timelines of 6-12 months, when practitioners feel that they should be accorded a similar time investment as development aid funding cycles. Some donors do have mechanisms for multi-year funding. The critical issue here is that while some humanitarian crises may be unpredictable, many are only too predictable – chronic emergencies, annual flooding and the like. In addition, the aggregate case load of the system possesses a high degree of predictability. Most operational agencies can predict at the beginning of the year at least half - and often as much as 80% - of their final workload.

## **2.4 Information technology in the humanitarian supply environment**

Information technology has numerous applications in humanitarian supply chain management, similar to the applications and benefits in commercial supply chains. The most obvious is the visibility or transparency it brings to the supply chain, which implies that the right goods and relief items are sourced and purchased at the right time and delivered to the right location at the right time in the right condition and at the right cost. Practically, one does not have to carry all stock keeping units (SKUs) in all the places (positioning centres, warehouses and field stores) if you know where which items are located.



Tomasini and Van Wassenhove, (2009, 89 - 114) use the documented findings of a case study of the 2001 earthquake in El Salvador (Tomasini et al, 2003) as a basis for their suggested structure for information management in emergency response supply environments. However, some information management learnings from sudden on-set disaster responses (or **emergency supply chains**) can be applied to **project supply chains** or **permanent humanitarian supply chains** as defined by Jahre and Heigh (2008). One could argue that there is a strong correlation between permanent supply chains and humanitarian supply chain management when one delineates emergency response logistics (emergency supply chain management) from the scope. Tomasini and Van Wassenhove postulate that there are three main categories of information relative to humanitarian supply chain management namely: visibility, transparency and accountability.

**Visibility** provides a snapshot of what is in the pipeline, according to Tomasini and Van Wassenhove (2009:91). They justify that visibility helps to determine what resources are still needed “when the information is compared to the needs, one can identify if the supply chain is doing the right thing, e.g. meeting the needs and thus measure its effectiveness. Tomasini and Van Wassenhove add “*while **visibility** provides information about the content in the pipeline, **transparency** provides an insight into the process. For example, one may be aware that 10 tons of wheat is on its way to the warehouse (visibility), but not certain if it will be delivered via the quickest or cheapest route.*” Tomasini and Van Wassenhove (2009:94) define **transparency** as “*the ability to understand how processes interact within the supply chain to improve performance.*” The answer according to Tomasini and Van Wassenhove will help relief agencies to redesign steps in the process, determine procurement needs, or help donors allocate their funds. Lastly, Tomasini and Van Wassenhove hypothesise that “**accountability** identifies who is responsible for the actions within the process and how well they are performed.” On page 97 (Tomasini and Van Wassenhove:2009) theorise that accountability consist of four phases namely:

- Responsibility:
- action:
- reporting: and
- responding

Information flows according to Tomasini and van Wassenhove (2009:102) consist of:

- Data gathering;
- processing;
- disseminating;
- audience;
- accessibility;
- accuracy; and
- timeliness.

Jahre and Heigh, (2008) state that IT-systems, human resources, and process standards form the basis of a supply chain process. They go to say: *“The regionalisation could not have been undertaken without appropriate information systems and support. The development of HLS - the humanitarian logistics software for emergency response logistics - started around 2002 and required a real culture change within the IFRC logistics. It was not until the Tsunami operation that the importance of such an IT system was realised: 'By 6th January 2005, everyone realised they simply could not have been running the Tsunami operation without HLS. Suddenly the logistics department bought into it' (Head IT department, Sept., 10, 2007). HLS is now implemented in the RLUs with access to Geneva and training and development of IT competencies among RLU staff. IT provides a service catalogue listing explaining the services they provide and for whom.”*

A United Nations UN study of 2013 on Global sanitation crises indicated at the time that six billion of the seven billion population had cellular phones, however

only 4.5 billion have access to toilets. A study done in 2014, determined that there are over 7.2 billion gadgets, like tablets, smartphones, and not-so-smart phones in the world. That is more than the global population at the time of the study, of somewhere between 7.19 and 7.2 billion. The gadget market is growing 5 times faster than we are, with our population growing at a rate of about two people per second annually according to GMSA. According to [www.statista.com](http://www.statista.com), there are 1 billion registered Facebook users, and Twitter have 316 million active accounts, with Tumblr, a blogging service, with more than 230 million active blog users on their site, and 3.2 billion internet users in the world according to [www.internetworldstats.com](http://www.internetworldstats.com). An internet user is defined as a person who can access the internet via computer or mobile device. Refer table 2.1 for details on the magnitude of internet users. Given all these statistics, not only can one conclude logically that data and information exchange can be done immediately such as crowd sourcing, crowd funding from anywhere in the world, but the information and connectivity can assist humanitarian organisations to programme more effectively and efficiently. The collecting and mapping of information in real time is made possible.

**TABLE 2.2 -The magnitude of world internet users**

<b>WORLD INTERNET USAGE AND POPULATION STATISTICS</b>						
<b>JUNE 30, 2015 - Mid-Year Update</b>						
World Regions	Population	Internet Users	Internet Users	Penetration	Users %	Growth
	(2015 Est.)	Dec. 31, 2000	Latest Data	(% Population)	of Table	2000-2015
<u>Africa</u>	1,158,355,663	4,514,400	<b>313,257,074</b>	27.00%	9.60%	6839.10%
<u>Asia</u>	4,032,466,882	114,304,000	<b>1,563,208,143</b>	38.80%	47.80%	1267.60%
<u>Europe</u>	821,555,904	105,096,093	<b>604,122,380</b>	73.50%	18.50%	474.80%
<u>Middle East</u>	236,137,235	3,284,800	<b>115,823,882</b>	49.00%	3.50%	3426.10%
<u>North America</u>	357,172,209	108,096,800	<b>313,862,863</b>	87.90%	9.60%	190.40%
<u>Latin America / Caribbean</u>	617,776,105	18,068,919	<b>333,115,908</b>	53.90%	10.20%	1743.60%
<u>Oceania / Australia</u>	37,157,120	7,620,480	<b>27,100,334</b>	72.90%	0.80%	255.60%
<b>WORLD TOTAL</b>	<b>7,260,621,118</b>	<b>360,985,492</b>	<b>3,270,490,584</b>	<b>45.00%</b>	<b>100.00%</b>	<b>806.00%</b>

SOURCE: [www.internetworldstats.com](http://www.internetworldstats.com)

The first step would be to collect data from the population hit by the crises, giving details of crises as well as geographical location. The data is then collated and mapped. This information is then shared to necessary parties, linking information to disaster response and aid. An example of this is the Haiti earthquake in January 2010. A project generated by students Tufts University in Boston. Digicel providing a SMS short code, 4636, where to they could SMS their location and crises, allowing US Marine Corp to evaluate the information and act on the crises. (Meier,P) New Information technologies and their impact on the humanitarian sector).

This resulted in the birth of the Standby Task Force (SBTF). This team focuses on specific information management. They monitor mainstream and social media sources for relevant information, identifies GPS co-ordinates for events, verify the accuracy and validity of information and produces information products. This group has grown to more than 800 volunteers in over 80 countries worldwide. The majority of the volunteers are professionals from the technology and humanitarian sectors.

In 2010, forest fires ravaged Russia, killing some 56 000 individuals and causing more than \$15 billion in damages. Several Russian bloggers decided to launch a live crises map for the disaster, and they decided to turn the platform into a 'help map' by crowdsourcing both the needs and offers for help. They set up a co-ordination service and call centre in order to facilitate the matching of needs with the resources being offered. The free, volunteer-run call centre enabled the elderly – and others not otherwise connected to the internet – to call in their needs or offers of help, this resulted in Russian activists to launch their own citizen based disaster response agency in a matter of days.

Using the Internet and Internet based tools like Skype, Google Maps, Twitter, Facebook and Ushahidi have multiple advantages:

- Can work remotely from anywhere in the world;
- instant messaging;
- agility;
- quick response time;
- volunteers in different time zones all over the world, result in 24 hour coverage;
- pin pointing areas that require attention to the exact location;
- collaboration; and
- community engagement.

The company LinkedIn recently added a ‘Volunteer and Causes’ field to their member profile page which is now available to 150 million LinkedIn users worldwide according to (Garlinghouse 2012).

In essence, information technology platforms enable humanitarian organisations to do a real time needs analysis. Walker and Pepper (2007:15) question the impact that a needs analysis framework (NAF) will have on matching dollars, both in terms of agency resources and expertise to collect large volumes of data in dynamic environments, and the political willingness of donors, agencies, and other humanitarian actors to commit to mechanisms that seek to allocate funds to identified needs. The NAF is a starting point, but needs to be followed up by more rigorous work on assessment methodologies (partly being tackled under the cluster sector reform and by OCHA), by appropriate staffing (partly being addressed by the collective NGO Emergency Capacity Building (ECB, 33) project, and by a commitment from donors and agencies alike to be evidence-driven, as advocated in the GHD. Donors, recipient agencies, beneficiaries, and humanitarian personnel have flagged a number of key concerns regarding the state of humanitarian needs- assessment. There is a critical dearth of hard data, particularly in the early stages of rapid onset disasters, to support dynamic needs assessment. Quantitative data on mortality, health, and nutrition could

provide a critical assessment of vulnerability, however, there are limited systematic and coordinated efforts to track and analyse this information. The proposed Humanitarian Health and Nutrition Tracking Service (HNTS) is designed to partially address this.

Humanitarian agencies are accustomed to making rough assessments from preliminary observations in rapidly changing environments. Lack of data on key indicators creates a self-defeating cycle where needs assessments are under-resourced by donors. Agencies are therefore unable to invest in needs assessments, and quickly lose visibility for donors. Behind this data gap exists a chronic problem of staffing, training and systems to enable agencies to collect data in a rigorous fashion. It may be a problem of under-investment, but it may also be a problem of system inefficiency, with too many agencies all intent upon carrying out their own assessments according to their own rational.

Walker and Pepper (2007:16) continue by stating a great deal of needs analysis requires not just generic skills but acute context specific knowledge and experience. This strongly suggests a role for local information collectors and analysts. Yet, in many crises, operational agencies staffed by relatively inexperienced expatriate staff are reticent or incapable of investing in the hiring, training and relationship building with local expertise and institutions. This is equally true for humanitarian programming needs assessments. Should there be independent, objective structures to promote rigor in these assessments, perhaps channelled through sector leaders?

According to the Chartered Institute of Procurement & Supply (CIPS), in a new survey of 645 supply chain managers world-wide, 65% of South African supply chain managers said they did not have complete visibility of their business's supply chains, with the majority (58%) having zero visibility beyond the second tier of their chain. The results raise serious concerns about supply chain practices and standards in the country, according to CIPS. The survey finds that

three in five businesses have no relationship with the suppliers in their second tier – an important mechanism for preventing fraud, minimising disruptions and finding corruption.

Lack of information leading to the opaque view of South Africa's supply chains means that nearly three in five businesses (56%) are unable to guarantee there is no malpractice (such as child labour, fraud or corruption) in their supply chain. South African businesses also lack the processes to cope with an unexpected disruption, such as a natural disaster, economic crisis or even armed conflict in a region on which they rely for exports or imports. Should a supply chain disruption take hold, only 40% of South African businesses are aware of a risk mitigation strategy which encompasses their whole supply chain. The survey also reveals the unseen disasters being averted by South African businesses on a regular basis. Over two thirds of businesses (67%) have avoided a major crisis in the last 12 months as a direct result of strong supplier relationships through supply chain visibility enabled by information technology with almost three quarters (73%) avoiding smaller disruptions. With only 50% of businesses in the rest of the world claiming to have averted a crisis through the same means, the figures highlight the scale of the challenge facing South African businesses as well as the benefits of closer supplier links.

The survey does reveal some good news for South African businesses, however, as 70% of procurement professionals in the country would take full responsibility for any malpractice found - considerably higher than in both Australia (43%) and the UK (40%). "These figures must surely be a wake-up call for South African businesses," said Andre Coetzee of CIPS Africa. "The extent of South Africa's supply chain blind spots threatens to put consumers and the economy at serious risk."

Generally, the state of integrated supply chain information and information management in humanitarian organisations is lacking. Oxfam would be one of a

few exceptions with their development of a bespoke Helios ERP system in collaboration with the Fritz Institute. There may be other less publicised exceptions as well. During many years of field work, the author compiled the following list of potential benefits of integrated and automated supply chain information management:

- Improved effectiveness
  - Better planning and visibility of these plans e.g. annual business plan, detailed implementation planning, buying plans and budgets;
  - enhanced execution and programme / project management;
  - more accurate purchase requests;
  - online approval of purchase orders (for example) with built in approval limits;
  - visibility of budgets and encumbrances leading to a reduction in over and underspending;
  - improved collaboration between business units within the organisation and SCM units;
  - ease of access and sharing of information;
  - no loss of papers.
- Improved efficiency
  - Reduction of manual data entry and recapturing of data;
  - accuracy of data entry;
  - ease of accessing historical data for analyses and system generated reporting and reports;
  - electronic alerts pressurising managers to be responsive in approving actions;
  - shortening approval processes; and
  - time savings.



- Enhanced donor confidence
  - Enhanced governance;
  - embedded supply chain business processes which reduces the ability of circumventing the processes;
  - improving controls and accountability;
  - greater discipline and adherence to business processes ensuring better compliance and fewer audit findings;
  - data base for system of record and for archiving data and audit trails of procurement process (prices, bids, quotes etc.); and
  - improved budget monitoring.

De Souza and Stumpf (2012: 109–115) include a chapter on the topic of how information technology can contribute to humanitarian disaster response. They are of the opinion that information technology makes an essential contribution to increase efficiency for all parties involved, from donor to beneficiary. The most important opportunities for getting value from using information technology, include:

- Visibility into the supply chain;
- tracking and tracing for relief supplies; and
- inter-agency collaboration.

Information technology should be used to assist humanitarian organisations in making proactive decisions and choosing the best options when it comes to providing aid promptly and effectively. One of the important decisions to be made regarding the use of appropriate information systems is "make" or "buy". Similar to the use and development of information systems in commercial supply

chains, humanitarian organisations have to decide to develop their own software or to buy proprietary products.

The benefits of developing in-house information systems include customisation, compatibility with existing systems and possibly lower costs although experience in practice confirms that in-house development often leads to much higher costs than originally budgeted. Owning the source code is a benefit although maintaining it requires dedicated software technicians which might be difficult to retain or expensive. Other disadvantages include the need for regular updates, difficulty to keep up with technology improvements as it is not the core business of humanitarian organisations and the challenge of creating and managing a dedicated User Group to maintain software development.

Tatham and Christopher (2014: 57–76) include a case study on progress with the development of the HELIOS supply chain management project and the specific experience of implementing the HELIOS software in Oxfam. The software was selected by Oxfam as it was seen to be fit for purpose, non-complex and simple to operate. They recognised the risk of taking the novel route in collaborating with the founding partners World Vision, Fritz Institute and International Medical Corps in the development of customised software, but they were confident of the advantages of cost sharing and offering low engagement threshold for the partners.

The business case worked for Oxfam and they showed the following qualitative benefits:

- The higher degree of prescriptive behaviour required to comply with the operation of the system, combined with a significantly greater level of detailed controls, led to much increased visibility of mandatory procedure (non) compliance;

- the use of HELIOS gives a better view of broader strengths and weaknesses in supply chain performance; and assets are more visible to management and there is a clear evidence of increased asset utilisation.

Some lessons learnt from this project suggest that such a collaborative project should be able to reduce costs by:

- Sharing development and maintenance of software;
- sharing supply chain best practice;
- sharing user documentation and training materials;
- building a pool of trained trainers and users; and
- more rapid deployment, by benefiting from the existing software and the experience of deployment in other organisations.

Some of the challenges with the project include:

1. Supply chain automation in humanitarian and development programmes can be made to work, but it is a long and resource intensive task; and
2. experience with the Helios project indicates that there are serious barriers to success in standardisation and interoperability between agencies.

The barriers are not unsurmountable and inspiration by donors to insist on efficiency, effectiveness and transparency of resource utilisation will obviously make it easier to implement appropriate information technology.

To conclude, information and information management is critical to humanitarian programming, but it is not about the technology platform only. Skilled people and integrated business processes are equally important. Some humanitarian actors resist investing in the technology component of humanitarian information management due to the perceived high costs. Therefore, it is critical to postulate a balanced view contrasting the initial cost and ongoing maintenance vs. the benefits as articulated in the paragraphs above. Investing in a technology

platform will not solve all problems, but together with skills enhancement and business process development, it will hugely contribute towards enhanced organisational effectiveness, efficiency and donor confidence.

## **2.5 Development in humanitarian supply chain management – The Global landscape**

Christopher (2011:257) says in the relatively short time that companies have been focusing on managing supply chains, the world has changed dramatically. Over the last three decades or so since the phrase ‘supply chain management’ has first been coined the world has witnessed a major trend to globalised supply chains, with activities that were once performed in-house are now outsourced, accompanied by a dramatic increase in volatility in the business environment creating ever higher uncertainties in both demand and supply. The globalisation of procurement, production and distribution has moved the value of integrated business logistics and supply chain management higher up on the priorities of industries worldwide, according to De Souza and Stumph (2012:9). De Souza and Stumph continue to state that *“supply chains have become competitive weapons in driving efficiency and responsiveness linking an array of specialized components such as procurement, manufacturing, sales, distribution and so on”*. They continue postulating that logistics and supply chain management have become important economic enablers and have positively impacted strategic corporate decisions in the commercial sector, but this is clearly lagging in the context of humanitarian programming. However, according to De Souza and Stumph (2012:9), the humanitarian sector excels admirably in many cases over the commercial sector in preparedness and response to unforeseen events.

Gattorna (2010: 51–56) has done much work in the development of supply chain frameworks and he suggests that there are typically four generic supply chains:

- Continuous replenishment supply chain: Very predictable demand from known customers; easily managed through tight collaboration with these collaborative customers; focus on retention of customer relationships;
- Lean supply chain: Regular pattern of demand; quite predictable and forecastable although may be seasonable; tend to be mature low risk products/services; focus on efficiency;
- Agile supply chain: Usually unplanned at least until the last possible moment. May result from promotions; new product launches; fashion marketing; unplanned stock-outs; or unforeseen opportunities. Focus on the service-cost equation; and
- Fully flexible supply chain: Unplanned and unplannable demand due to unknown customers with exceptional, sometimes emergency, requests. Focus on providing creative solutions at a premium price.

This last type is further split between a business event strategy in an entrepreneurial environment and a humanitarian response strategy in an emergency environment. Gattorna (2010: 251–260) recommends that the emergency response/humanitarian supply chain should not only be agile, but fully flexible. In disaster situations, there is usually an initial event (or series of events) that dictates the requirement for a fully flexible supply chain, although it changes from the critical response phase into the on-going rebuilding phase. The immediate aim is to quickly provide life-saving essentials to the survivors, who often have no choice of buyer behaviour, but rather "whatever is provided". In the next stage, when basic living requirements are restored, and in the rebuilding phase, survivors will exhibit a greater range of buyer behaviors as the situation permits. This situation occurs when an entire complex of supply chains need to be created from scratch because of a major disruption to normal living and business due to situations such as war, terrorist attacks, famine and natural disasters such as earthquakes, tsunamis or cyclones.

Going back to the four typical humanitarian situations requiring logistics services, it is indeed possible to match them with the generic supply chains of Gattorna in Table 2.2 as follows:

**TABLE 2.3 - Matching humanitarian situations with generic supply chains**

Humanitarian Situation	Generic Supply Chain
Emergency relief or response	Fully flexible supply chain
Food distribution	Lean supply chain
Distribution of gifts-in-kind	Continuous replenishment supply chain
Development projects	Agile supply chain

Emergency relief or response clearly requires a fully flexible supply chain while food distribution needs a lean supply chain, possible because of known demand from historic take-off. Gifts-in-kind usually provides for predictable demand due to long term relationships and regular supply of school books or medicines while development projects often necessitate agility to be able to respond to unplanned or unforeseen demand.

According to The Guardian of 25 October 2014 ([www.theguardian.com/global](http://www.theguardian.com/global)), global spending on humanitarian relief soared to a record \$22bn in 2013 as conflicts in Central African Republic, South Sudan and Syria combined with natural disasters drove donors to pay out more emergency aid than ever. Donations from governments reached \$16.4bn last year, 24% increase from 2012 says research group Development Initiatives (DI), in a preview of their annual report. Private donations from corporations, foundations, individuals and trusts, usually in response to natural disasters grew by 35% over the same period. The total bill for typhoon Haiyan in the Philippines, which affected 14 million people, and the conflict in Syria, which affected 9.3 million people, was more than \$7bn, said Christina Bennett, a Research Fellow in Humanitarian Policy at the Overseas Development Institute (ODI). In per capita terms, Syria

was the most expensive crisis, at close to \$700 per capita, followed by \$322 per capita in South Sudan, she added.

Despite a record level of aid, Dan Coppard, director of research and analysis at ODI, said: "There is no place for complacency, with over a third of needs still not being met and demands set to rise in 2014 and beyond. As more actors provide assistance, we will need to improve the transparency of both humanitarian and other potential financial resources to target populations more effectively. "Humanitarian assistance is only one small element of the total resources reaching crisis-affected countries, yet it continues to play a critical and unique function in providing a principled response to crisis-affected populations." The UK and US were the top donors of humanitarian aid last year, while Turkey spent \$1.6bn (£940m) on relief projects, mainly aimed at the 735,000 Syrian refugees living in the country, making it the third-largest donor.

Whilst one cannot say with any certainty what the next few years will bring by ways of change, there are some clear trends that some indication of the backdrop of the future supply chain environment according to Cristopher (2011:257). Christopher goes on to defining the following global mega trends (2011:258):

- A projected increase in the world's population from somewhere in the region of 7 billion today to over 9 billion by 2050. At the same time age profiles are changing differently across countries and regions and this combined with cross-border migration will mean that some country's population may grow whilst others may shrink. From a commercial perspective, spending patterns will change causing some markets to expand and others to decline. From a humanitarian perspective, this mega trend will place much more stress on already strained infrastructure at the bottom of the income pyramid leading to reduced resilience.

- The United Nations reports that already today half the world population currently live in urban areas and by 2015 about 70% will be city dwellers. The growth in urbanisation will lead to so-called mega-cities that have a population of 10 million people or more. The commercial challenge of serving these massive populations will require an increased focus on 'city logistics' with city specific solutions. From a humanitarian development perspective, this mega trend will place much more stress on already strained infrastructure leading to more pollution and increased higher prevalence of malnutrition, sickness, lack of hygiene to mention only a few consequences.
- The trend towards a redistribution of wealth from the western world to the newly emerging economies will continue. For example, it is estimated that over the next 20 years, the US's share of the worldwide wealth will slip from 28 percent to 24 percent. Asia's share of the global market will almost double, meaning Asia will account for over 50 percent of the global economy by 2030. The middle classes in the emerging economies are likely to increase from 400 million to over 1 billion by 2030. This trend may well lead to communities living in developing economies becoming more self-sufficient and less dependent on foreign aid.

Continuing with Christopher's research on emerging trends (2011:259 – 261), he interprets the supply chain of the future under three themes namely ***Shifting centers of gravity***, ***Shifting centers of economic activity***, and the ***Multi-channel revolution***.

- **Shifting centers of gravity**

Christopher (2011:259) states: "All supply chains have a center of gravity determined by the pull of demand and supply factors. The relative costs and availability of materials and the costs of moving them to the point of final demand will determine where the optimal locations for factories, distribution



and other value-adding activities should be. Because of the uncertainties that surround the future patterns of demand and supply and the potential changes in input costs such as energy and other basic commodities, it becomes imperative that any decisions to redesign supply chains reflect the need to maximise flexibility. Ideally, the supply chain of the future will be capable of adapting quickly to any shifts that might occur on both the demand side and the supply side of the business.”

Equally, with the continued volatility of many input costs, particularly oil and energy, many companies are already reviewing their existing supply chain strategies. For example, in June 2008, Keith Harrison, Chief Product Supply Officer of Procter and Gamble was quoted saying: “Soaring energy costs are forcing P&G to rethink how to distribute its products...A lot of our supply chain work was implemented when oil was \$10 a barrel...I could say that our supply chain design is now upside down...What is our business going to look like in 2015?”

If the current conditions of turbulence and volatility continue, it may be that the supply chain solutions that served us well in the past may no longer be fit for the present or future purpose. As mentioned above, there is mounting evidence that because of major demographic changes, the center of gravity in many markets will shift, causing a rethink of existing supply chain structures. The shifting centers of gravity and the growing urbanisation of society are trends that are already evident and forward thinking humanitarian supply chain planners will already be factoring them into their strategy.

The use of logistics platforms located on the edge of large cities is likely to increase to enable the consolidation of shipments for delivery into those cities. This will be accompanied by a growing number of collaborative arrangements amongst companies that will share logistics assets such as transport and distribution centers. The dynamics that causes these shifting

centers of gravity will significantly influence the designs of the future humanitarian supply chains. This change in strategy will also be influenced by the growing environmental concern over carbon footprints but also by cost consideration as transport costs continue to rise.

- **Shifting centers of economic activity**

Professor Martin Christopher (2011:260) continues by saying: “The world is undergoing a massive realignment of economic activity, whose outlines are clearly visible in the changes occurring in the energy and material sectors.” He goes on stating: “Growth in demand for energy and basic material such as steel and copper is moving from developed countries to developing ones, predominantly in Asia. On the supply side, Asia’s strong demand environment for energy and basic materials, coupled with its low labour costs means that the region will increasingly become a global producer of aluminum, chemical, paper and steel. China for instance is adding steelmaking capacity so rapidly that its production will rise and in the process it will become a leading exporter.

Over the next decade, resources will generally be developed and produced farther away from the points of consumption than ever. Brazilian fibre for instance will be converted into paper product in China. In natural gas, the amount of indigenous production consumed within countries will continue to decline, replaced by cross border flows delivered by long distance pipelines and by ships carrying liquefied natural gas. Oil production too will increasingly switch to regions that are more and more remote as developed countries with diminishing reserves seek new supplies.

Important macroeconomic shifts are also occurring within regions. States in the Middle East are expanding their reach beyond oil into new industries such as chemicals and metals. To be sure, the rising levels of global

connectivity required to meet the world's energy needs in the coming years will have positive economic effects, such as greater market liquidity and more globally priced commodities. At the same time longer and more complex supply chains, combined with the mounting possibility that geopolitical events could curtail supply, will make prices more volatile.

As the demographic and income distribution changes, other trends are reshaping the supply chain landscape. One trend in particular is the emergence of new routes to markets and the adoption by many companies of what has come to be termed 'multi-channel' distribution. The challenge for the humanitarian supply chain thought leaders will be understanding how the shift in economic centers of gravity will impact on development and preparedness programmes of the future.

- **The multi-channel revolution**

Christopher (2011:261) states the arrival of the internet spurred a dramatic growth in recent years of the use of alternative channels of distribution. Whilst the old route-to-market may still be used, they have been augmented by these new channels which more often than not bypass traditional intermediaries and enable a direct contact between the supplier and the customer or consumer. Many companies offer their customer's a range of option for ordering and for delivery or collection. A retailer might offer the traditional brick and mortar outlets but also an internet service for online shopping and the possibility of home delivery or collection from the store.

It is not only the sheer scale of this new channel that brings challenges to logistics management, it is also the fact that the internet is likely to speed up the shift from a sellers' market to a buyer's market. In a way the internet democratised the supply chain by placing the customer or consumer at the center of the network. The customer can rapidly access information on

alternative suppliers, they can make price comparisons, they can assess delivery lead times and they can demand to have their own specific requirements catered for. Therefore, opportunity could present itself to the humanitarian supply chain to enable their developing communities to access local markets through shared internet stations enabling these communities to become familiar with technology and source from local suppliers portals whilst supporting the local economies.

There have been some clear trends in the development of supply chain management best practices as well. Scholten et al (2009) states in their paper called "Supply chain management concepts and humanitarian aid agencies" that supply chain management plays a critical role in saving lives and improving living conditions as it comprises 80% of relief operations (Van Wassenhove, 2006). However, despite the positive results that have been achieved using supply chain concepts in the commercial sector, humanitarian agencies largely ignore the techniques developed, overlooking possibilities to increase efficiency and effectiveness. Instead they rely on standards used in the for-profit sector in the 1970s and 80s (Fenton, 2003; Gustavsson, 2003; Rickard, 2003). This research represents an initial attempt of applying supply chain theory to the humanitarian area. It particularly explores whether the concept of agile supply chain management is applicable to the supply chain management of humanitarian aid organisations. It is an exciting opportunity to provide practitioner guidance and to contribute to theory development. Scholten et al explored current practices of logistics in humanitarian supply chains as well as the concept of agility and leagility with the aim of building a bridge between the two of them. They explored by analysing the humanitarian sector and challenges within. They outlined present humanitarian supply chain management and summarize to date literature and findings of supply chain theory in NGOs. To build a bridge and give supply chain theory background we then outline the concept of agility and other strategies associated with it (postponement and leagility).

The following paragraphs will articulate the research methodology and findings regarding commercial supply chain concepts in light of the humanitarian sector. Scholten et al will apply the characteristics of agility and the associated concepts of postponement and leagility to supply chain practices in NGOs and test to what extent the NGO supply chains can be described as agile. The following paragraphs will be discussed under the ***humanitarian aid sector***, ***humanitarian supply chain management***, and the ***evolution of agile supply chain management***.

Broadly speaking, foreign aid-assisted projects can be categorised as developmental aid and emergency aid. The focus of this study is development aid and programming. Development aid is constantly offered to a country over longer periods of time in order to develop those communities. It can be in the form of education, roads, goods, etc. Emergency Aid is given to countries over a shorter period after a disaster or war has happened to facilitate basic needs to the people experiencing difficulties in these situations.

- **The humanitarian aid sector**

While there are many players in humanitarian relief operations such as the United Nations (UN), the military, NGOs and profit seeking organisations, donors are favouring NGOs. There is a higher visibility on how funds are actually contributed than in governmental bodies and likewise NGOs are more accountable for the resources spent. Thomas and Kopczak (2005) claim that the demand from donors for performance and impact, which makes the competition for donor funding more intense, as one of two external factors impinging the growth and operations of international humanitarian relief organizations. Donor bodies are starting to demand that aid agencies collaborate around the creation of common services. Consequently, aid agencies have to become more aware of the need to strategically use their resources since data demonstration (results etc.) is

likely to be the differentiator for donors to decide which agency to donate money to and who to trust. The second factor Thomas and Kopczak identify is the ever increasing number of simultaneous operations and number of disasters around the world, which is broadening the existing resources of all agencies. Ways to operate more efficiently have to be found in the sector as a whole in order to be able to respond to all needs. Therefore, the need to review and evaluate supply chain management in NGOs as differentiator in delivering aid and its high importance in operations.

- **Humanitarian supply chain management**

**Current practices:** Humanitarian logistics is defined as the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials as well as related information (Thomas and Kopczak, 2005:2). This includes preparedness, planning, procurement, transport, warehousing, tracking and tracing and customs clearance. Activities take place along the whole supply chain from the point of origin to the point of consumption with the aim to improve conditions for people affected. Managing humanitarian supply chain holds unique challenges, as unlike commercial supply chains, demand cannot be anticipated (Long and Wood, 1995). These factors make it difficult to assess demand and supply requirements (Van Wassenhove, 2006). Hence, there is a high need of flexibility as distribution networks have to be set up quickly.

Despite this importance of supply chain management in operations, logistics is still seen as a support function in many humanitarian companies (Thomas, 2003). The function is often excluded from the decision making process, even though it will fulfil most of the critical tasks. Van Wassenhove (2006) notes that for years humanitarian supply chain management has been struggling for recognition as there has been a lack of understanding of the benefits as well as acknowledgment of the importance. Recent interest in the

area is largely practitioner based which has led to calls for greater academic interest and debate on how supply chain management can be applied by humanitarian aid providers (Kovács and Spens, 2007). There is an appearing need for literature developing links between commercial logistics and not-for-profit organisations.

**Developments in literature:** The overall aim of any international relief or development operations should be the establishment and management of an efficient and effective supply chain (Pettit and Beresford, 2005), which necessitates the use of strategic approaches. Humanitarian aid supply chains are clearly unpredictable and unstable. Hence, a high degree of flexibility is needed, which means that insights are to be achieved from exploring their potential as agile supply chains.

Oloruntoba and Grey (2006) introduced a preliminary investigation into whether agility is part of humanitarian supply chain and display a possible agile humanitarian supply chain. When applying agility to humanitarian aid supply chains, Oloruntoba and Grey suggest holding inventory in a generic form instead of using prepositioned stock. Aid goods can then be distributed according to the evolving needs of the end user, the concept of postponement, resulting in the use of more accurate data and reliability of information about recipients' immediate needs while saving costs, overcoming security risks and speeding response and flexibility. However, it is dependent on the input of information from local people regarding the complexity of operations as well as changing needs as an agile supply chain responds to real demand (it is information driven) which diminishes forecasting errors and therefore reduces costs and waste. Moving on we will outline the concept of agility and methodologies associated with it in order to see to what degree they can be part of a humanitarian supply chain.

- **The evolvement of agile supply chain management in commercial terms**

**The concept of agility:** The concept developed in the 1990s as systems for flexible manufacturing (FMSs). Their purpose was to enable rapid change e.g. reduced set up times and greater responsiveness to changes in product mix or volume. The notion of agility is holistic rather than functional and of strategic rather than tactical importance (Power et al., 2001). It integrates supplies, business process, customer and product use and disposal. Furthermore, it is customer enriching as an individualised combination of products and services in arbitrary lot sizes is possible (Aitken et al., 2002). Another key characteristic of agility described by Aitken et al. (2002) is that an organisation can obtain the ability to synthesise new productive capabilities from the expertise of people, by enabling knowledge, skills, innovative thinking, emphasised management, and physical facilities regardless of their internal or external location.

The concept of agility was extended into the wider business context by Nagel and Dove (1991) as it is clear from core characteristics that agility is more than a manufacturing system. Sanchez (1995) notes that one strategy for gaining and maintaining a competitive advantage in a dynamic environment is to create a flexible organisation. He characterises strategic flexibility as having two dimensions: resource flexibility and coordination flexibility. Resource flexibility is the extent to which a resource can be applied to a range of alternative uses, the costs and difficulties associated with the switching from one resource to another and the time required for the switch. Coordination flexibility is part in processes that redefine product strategies, reconfigure chain of resources to produce product and re-deploy those resources needed to produce the product.



From these flexibility characteristics the centrality of supply chain management is evident. Therefore, literature for agility evolved in recent years into the area of supply chain management, where it refers to the use of market knowledge and a virtual corporation to exploit profitability opportunities in a fast changing marketplace (Naylor et al., 1997). Agile supply chain management as described by Ismail and Sharif (2006, p.431) captures 'the ability of a supply chain as a whole and its members to rapidly align the network and its operations to the dynamic and turbulent requirements for the demand network', in other words the key attribute of agility in an organisation is flexibility. Furthermore, according to Christopher and Towill (2000) agility is a business-wide capability that embraces organisational structures, information systems, logistics processes and overall mind-sets. All companies within a supply chain network need to be integrated into strategic planning processes to achieve an impact beyond the individual company (Van Hoek et al., 2001) as the effectiveness of a company's response to volatile market conditions is largely determined by the capabilities of trading partners (Power et al., 2001). Consequently the reliability of supply is a critical success factor for agility.

**Characteristics of agility:** Today, in various forms in supply chains, the agility concept is recognised as a winning strategy for growth and almost essential for the survival of an organisation in most business settings (Ismail and Sharifi, 2006). It adds needed flexibility between and within all partners in the chain, including departments within an organisation and external partner (suppliers, carriers, third-party companies and information systems providers) (Duclos et al., 2003). The relevance of the concept depends very much on the environment a supply chain is built in. Fisher (1997) proposes that, functional products with predictable demand profit most from "physically efficient" supply chain operating structures and that innovative products need "market responsive" supply chain processes that are focused on speed and flexibility rather than costs.

According to Harrison et al. (1999) an agile supply chain is capable of reading and responding to real demand (market sensitive). In industries where service and customer value enhancement are the key requirements the total lead-time needs to be minimised as demand is highly volatile and therefore difficult to forecast (Christopher and Towill, 2000). Furthermore, the supply chains need to be integrated along the lines of virtual supply chains, as it should be information-based rather than inventory-based and processes (collaboration of work effort between supplier, the organisation and customers e.g. product development, common systems). This leads to a network based system in which supply chain partners are linked together by coordination of the network and alignment of strategies in order to develop transparency along the supply chain. Other methodologies such as postponement, lean production, mass customisation and Just-in-Time are associated and combined with agility, as they can contribute an important building block to the construction of an agile supply chain.

**Postponement:** Postponement or delayed configuration is as stated by Christopher and Towill (2000) a vital element in any agile strategy. Furthermore, as suggested by Van Hoek (2000) postponement is one initiative that has been identified to support the realisation of the agility vision in practice. Postponement contributes to agility by the use of common platforms, components or modules so that final assembly or customisation can take place after the final customer is known (Christopher and Towill, 2000), which reduces uncertainty and enhances efficiency (Van Hoek, 2001). Therefore, it supports market sensitivity due to customised and localised assembly, virtual integration by supply chain operations that are linked to the customer orders, process integration by cross functional links e.g. between manufacturing and distribution and network integration due to the critical role of supplier networks (Van Hoek, 2000).

Christopher and Towill (2000) comment that as a result of limited ability to anticipate real demand supply chains are often forecast driven. The point in the chain where real demand is fed upstream into a supply chain and meets the forecast driven demand is called decoupling point (information decoupling point). Ideally inventory should be kept in a generic form as far downstream in the supply chain as possible awaiting final assembly or localisation (material decoupling point), which is the aim of agile supply chain management and the concept of postponement. Christopher and Towill (2000) suggest that by managing these two decoupling points a powerful opportunity for agile response can be created while minimising the Forrester effect.

**Recent developments in literature (leagility):** Van Hoek et al. (2001) identify another research stream that can contribute an important building block to the construction of an agile supply chain combined with lean production. This supply chain concept evolved out of a manufacturing theory which was concentrated on the reduction and elimination of waste (Aitken et al., 2002). It is a preparation for responsiveness and agility (Van Hoek et al., 2001). Childerhouse and Towill (2000) note, that leanness is relevant where consumer demand is relatively stable. Therefore, if the market is volatile the concept needs to be decoupled from part of the supply chain process and combined with agility into a hybrid leagile strategy where lean principles are applied downstream in the chain and the concept of agility upstream.

- **Humanitarian supply chains and postponement**

The methodology of postponement can be associated and combined with agility. It contributes an important building block to the construction of an agile supply chain while strengthening it. It is based on the principle of designing products in a way that common modules can be used so that customisation can take place after the final market or customer is known.

Therefore, postponement leads to an information based and demand driven supply chain which is one of the characteristics for achieving agility.

Decoupling points that decide on where in the supply chain real demand meets forecast driven demand need to be set depending on the kind of postponement needed. In emergency situations humanitarian agencies use standardised kits that cover the basic needs of the suffering population, which are often not 100 per cent adequate. However, it makes the postponement of inventory allocation to specific countries possible and reduces the amount of goods that need to be stored in general. Most NGOs have several warehouses in key areas to keep pre-positioned stock that is only used for emergency situations. It is called off and allocated in case of a disaster occurring. Therefore, the supply chain is demand driven, the decoupling point being the regional warehouses.

NGOs generally do not keep inventory for development aid. Goods are ordered or acquired when the need for them is recognised. Hence, the supply chain is demand driven; however, it is also accompanied by longer lead-times. Considering all aspects involved in humanitarian operations Scholten et al (2009) conclude that present practices are best suitable for the current situation. However, when agencies get to a stage where suppliers are integrated into their processes and have visibility of demand and stock levels there will be the opportunity to combine emergency relief and development supply chains by applying postponement to both operations. It would then be possible for vendors to replenish stocks to a set safety level diminishing forecasting errors, reducing the lead time for development goods, achieving cost savings for the NGOs as well as vendors and increasing responsiveness and flexibility.

- **Humanitarian supply chains in context of the definition of agility**

Ismail and Sharif (2006, p.431) describe agility as ‘the ability of a supply chain as a whole and its members to rapidly align the network and its operations to the dynamic and turbulent requirements for the demand network’.

In light of Ismail and Sharif’s description, Scholten et al (2009) concluded that agility is a part of humanitarian supply chains as literature have clearly shown that one of NGOs’ strength is the capability to set up a distribution network within 24 to 48 hours of an emergency happening and align demand with supply. However, this is only true for disaster relief operations and not for development needs as these involve a different supply chain. Duclos et al. (2003) have developed specific characteristics defining a flexible organisation: operations system flexibility, market flexibility, logistics flexibility, supply flexibility, organisational flexibility and information system flexibility. Agility is associated with responsiveness and flexibility. When investigating to what extent humanitarian aid organisations are flexible, it can be said that, their supply chains are true to these characteristics, besides the element of information system flexibility. Scholten et al (2009) research has shown that supply chain technology for humanitarian aid organisations is only in the development stage. Nevertheless, does being a flexible organisation mean that they operate an agile supply chain?

To answer this question it is necessary to explore whether NGOs are tuned along the lines of the four basic elements of agility by Harrison et al. (1999) (Market sensitivity, virtual integration, process integration and network integration). A supply chain that is market sensitive reads and responds to real demand and is therefore demand driven. This is true for the supply chain of development aid as goods are ordered when a need occurs and not stored according to forecasted needs. The emergency aid relief chain is

different; goods are pre-positioned in warehouses around the world to be able to react quickly in case of a disaster striking. However, in combination with postponement it is still demand driven and market sensitive. For humanitarian supply chains to be virtually integrated information technology is a necessity so that data can be shared between buyers and sellers. Our interviews have shown that, humanitarian organisations are only starting to deploy technology and are far from sharing data with suppliers. Hence, the emergency aid supply chain is not virtual due to its nature of being based on inventory. However, the supply chain for development aid is information driven and therefore true to the characteristic of virtuality. Process integration relates to co-operation all along the supply chain in a way that no boundaries exist. Technology is once again a necessity. Humanitarian aid agencies are in the process of testing and implementing technology, but it is in the early stages, they are far from integration processes with suppliers such as vendor managed inventory. Hence, process integration does not take place in either the development or in the emergency aid supply chain. Network integration, the alignment of supply chains of different partners into one supply chain, is based on process integration. In order to establish a network of processes all along the supply chain all participants need to be integrated to achieve information sharing and transparency throughout. As there is no process integration in humanitarian aid organisations there is no foundation for network integration either.

Therefore, although NGOs are flexible organisations and humanitarian emergency supply chains meet the definition of an agile supply chain, they do not meet the characteristics behind the concept of agility. However, NGOs are on the way to achieving more agility by developing and implementing the necessary technology systems and with it the element of virtuality. Once that has been accomplished the next step towards an agile supply chain is process integration in a way that suppliers are part of the planning procedures in order to

reach the final integrative stage (network integration) supporting the realisation of the agility vision in practice.

## **2.6 Development of humanitarian supply chain – Knowledge management**

Supply chain management, like most business functions relies on the combination of competent and committed people, integrated business processes and enabling technology for decision support. Lacking in one or more than one of these three pillars of people, processes or systems, will bring about debilitating lack of capability. The Fritz Institute states in a White Paper: *From Logistics to Supply Chain Management: The path forward in the humanitarian sector* (2005:5) by Anisya, S Thomas and Laura Rock. Kpopczak, in general, humanitarian organisations are defined by their personnel, who share a common value system based on alleviating the suffering of those affected by disasters and humanitarian emergencies. People who choose a career in this world come from diverse and varied backgrounds and are driven by a desire to resolve crises and do well in the world. They achieved their positions by trial and error and have honed their valuable skills through experience in multiple disaster theatres, rapid on-set emergency response as well as slow onset humanitarian programming, over several decades. However, the vast majority of people with logistics responsibilities in humanitarian organisations do not have training in logistics. While this is changing in large multilateral organisations, the trend toward the “professionalisation” of logistics has been slow to take hold as field experience is considered much more valuable than formal training in logistics.

The Fritz Institute continues, as the operations of international humanitarian organisations expand, to simultaneously include multiple geographies, organisations are struggling to find people who can manage the complex supply chains of relief. For example, in order to effectively respond to the Tsunami,

88% of large aid agencies surveyed had to pull their most qualified staff from the ongoing humanitarian operations in Darfur.

Humanitarian logistics has the opportunity to increase its contribution to disaster relief and to be recognised for that contribution by implementing initiatives in the areas of knowledge management, technology, measurement, community, and positioning. While moving relief items to disaster sites will continue to be an important role for logistics, the strategic focus must be on providing timely information, analysing that information to garner insight as to how to improve operations, and learning internally and with others. Establishing a community that shares and invests jointly in advancing the field can leverage each logistician's efforts many-fold. It is through these two mechanisms of information and community that humanitarian logistics can find its voice and create its future, rather than limit itself to responding to the present.

The International Federation of the Red Cross and Red Crescent Societies (IFRC) human resources have encountered significant challenges that have been accentuated by the implementation of the regional concept. Many staff are temporarily employed and are mobilised only when disasters strike, making it difficult to defend long-term and expensive training programmes. The IFRC tries to meet its main HR challenges regarding both recruitment and the need for more continuous training, planning, and coordination. *“You have to have more or less the same people in key positions [who] would be able to keep the same policy - to keep stability and consistency”* (Head KL- RLU (Kuala Lumpur Regional Logistics Unit), Dec. 13, 2007).

With regionalisation, operational support has been completely decentralised. Now the task of the GVA-LRMD (Geneva) is to help the regional logistics coordinators with training, tools, and standards and to support them in training their local/regional staff and building logistics capacities within the local teams: “. it is important to keep control from here and to make sure that the standards we



are developing are implemented in the regional logistics units .' (Reference: Field logistics officer, June 28, 2007).

When the IFRC decided to include knowledge management as part of its preparedness strategy (Tomasini & van Wassenhove, 2009: Chapter 3), it was because it understood that further competencies and value could be created from the lessons learned from previous disasters. The IFRC acknowledged that its supply chain would dramatically improve if it could capitalise on the knowledge possessed by the staff of the Red Cross Movement globally.

Knowledge is created not only within the organisation, but also between organizations as they interact in the field. In fact, the maximum value of knowledge is produced only when it is captured and shared among the different stakeholders. Based on this, the United Nations Joint Logistics Cluster (UNJLC), like the IFRC, has extended its information management function to capitalise on this shared knowledge. The UNJLC's objective is to coordinate the efforts of humanitarian agencies, reduce duplication of efforts, and leverage resources (such as time, money, goods, transportation, human capital, etc.). Former Chief Information Officer Nigel Snoad (Tomasini & van Wassenhove, 2009:116) comment on his experience dealing with disasters: *"Basic information like fuel prices, road distances, (light schedules, or truck rates can easily be posted directly onto the website. It saves users time to have all that data centralised. However, the impact on the relief operation has been minimal when we have done this. Gathering and processing data to publish information is only half of our job, and the work would be incomplete if that is all we did ... The real goal is to disseminate knowledge that would drive the organisations to coordinate and become more efficient in light of limited resources and time pressures.*

Tomasini & van Wassenhove continue to explore how knowledge is created, at what levels it is needed, potential bottlenecks in collecting, processing, and disseminating it, and lastly the barriers to knowledge sharing.

### **How is knowledge created?**

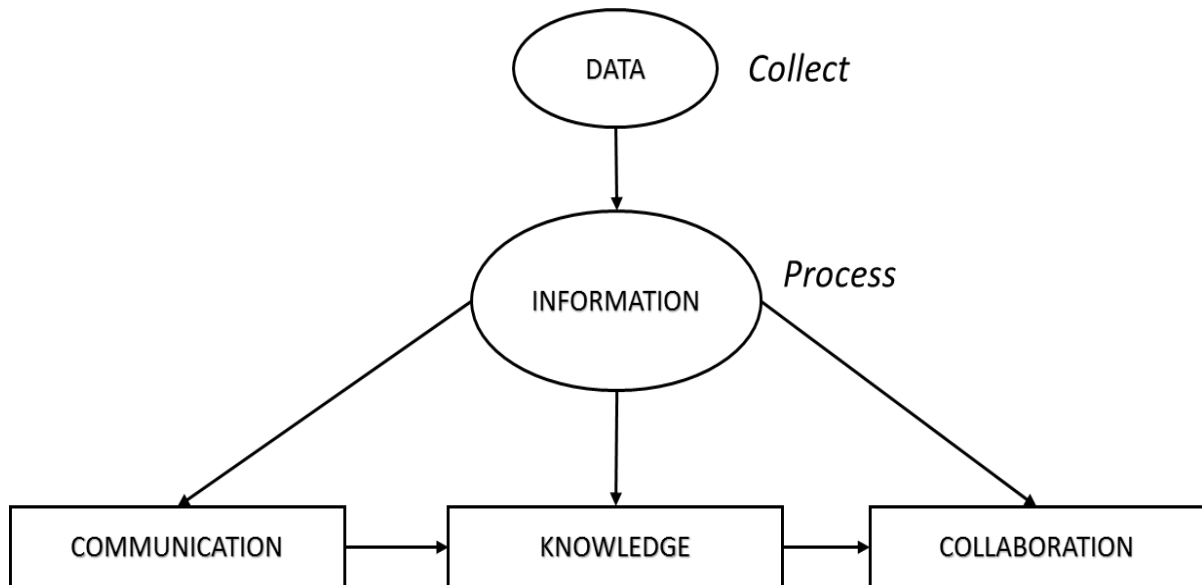
Nigel Snoad continues by stating (Tomasini & van Wassenhove, 2009:116) that soon after the surrender of the Taliban forces in September 2002 a UNJLC team was deployed for the first time ever in Afghanistan. *"They were to focus on the logistics and coordination issues for relief efforts. Upon arrival they quickly realised that most agencies were experiencing the same bottle-necks, yet there was little exchange of information and resources to overcome them. They encountered a typical scenario for emergencies where there was data overload, poor or unreliable information, little knowledge sharing, haphazard communication, and occasional, if any, interagency collaboration. One of the initiatives of the UNJLC was to create a website through which field updates could be widely distribute. In designing our information strategy, the goal was to support the UNTLe's coordination mandate. So our products had to be valuable and crucial in helping agencies to collaborate and coordinate their activities, reducing duplication of efforts, competition, cost of operation, and lead times. We needed to fill a gap in the humanitarian community by providing knowledge that would bridge their bottlenecks and improve efficiency."*

Snoad goes on to say: *"The task was not so simple. We were overloaded with data from many sources and a wish list of requests. We focused on logistics and began to process pieces of it to create information. The website and the bulletins had to be a one-stop point for information with clear and reliable recommendations for action that was quick to access."*

Through their trials and errors, the UNJLC team learned that good information did not necessarily translate into effective coordination. This would be achieved only if knowledge could facilitate collaboration and maximise the use of resources. With the goal of fostering collaboration, they agreed on a process that would collect data and turn it into information. Communication of this information would result in prompt action. It would also evolve into knowledge

when interpreted based on previous experience. This shared knowledge would hopefully lead to better collaborative efforts (see Figure 6.1).

**FIGURE 2.2 - Actionable data process**



SOURCE: Tomasini & van Wassenhove: (2009:118)

- **Data**

Data is raw, unprocessed material such as facts and statistics that can be analyzed to produce information. The main problem with data collection is the potential for overload. Imagine driving down a transportation corridor in Afghanistan and trying to record every detail along the way, unaware of the purpose and usefulness of the data being collected. However, some data like the temperatures in the mountains during the winter can be very helpful.

- **Information**

Information is data that has been given meaning, basically data processed in function of the context in which it is disseminated. It has a purpose and prompts action. It therefore needs to be timely, and in the format the recipient needs.

Information is crucial to maintaining and adapting competitive levels of resources (human and capital) and allowing officials to strategically plan their deployment.' This way donors and humanitarian agencies can, at different stages of the emergency, assess and deploy the right amount of funds, goods, and skills to the ground in a way that adds the most value without creating bottlenecks or inefficiencies.

Continuing with the Afghan winter example, the information created based on the raw temperature data dictates that access to the mountains will be blocked and additional resources will be needed to get people through the coldest months.

- **Communication**

Exchange of information with a value statement equals communication. For instance, *"My stock of blankets has dropped to 10 units, I am going to be in trouble. There is a shooting in the main road corridor."* Much of this can be based on the interaction with locals, whose knowledge of the area and conditions can help to give a value statement to the information communicated. The value statement qualifies the implications of the information, often giving an indication of the actions required, as well as their urgency.

For example, in planning their winterisation strategy for Afghanistan, humanitarians had to survey the locals to assess before the winter what the conditions would be like later on, and what factors should be considered for prepositioning goods.

- **Knowledge**

Information becomes knowledge when know-how and staff expertise have been used to interpret it and make decisions. Much of this is based on the interpretation of experts or senior staff members.

For the Afghan winter example, this means that a food prepositioning strategy should be designed and executed before the winter to assist people in the high mountains.

- **Collaboration**

Collaboration is when knowledge is equally shared and the parties are able to align their incentives to produce action. Following our example, the different agencies interact with suppliers and transport providers to implement the winter seasonal strategy together in time.

### **Knowledge is created and needed at different levels**

Indeed, knowledge is not exclusive to one layer of an organization, and should travel vertically and horizontally among the different components. In the case of a humanitarian supply chain, there are three main levels at which knowledge is created and needed: field, supply chain, and theater levels.

- **Field Operations Level: Knowledge Resides in the People**

This level is the most people intensive, and in the case of humanitarian operations is often considered the main source of knowledge due to its proximity to the conditions and needs of the beneficiaries. Humanitarians in the field are in closest contact with needs, and thus are most informed and knowledgeable about priorities. However, it is one of the most challenging aspects to manage.

For example, in Afghanistan, the year one winter season strategy proved to be very successful. However, despite success the previous year, year two was a failure. How did that happen? It was very hard to implement a strategy in the second year because none of the staff from the previous year was still present in the country, and in most cases there had been no overlap and knowledge exchange between people coming in and those leaving. There was almost no transfer of experience at the organisational level and little

knowledge was absorbed by the participating agencies to support the future operation. This is not a rare situation in a field with high staff turnover. People are oftentimes overworked, with limited resources and time, and are frequently pulled out of an operation abruptly, to be dragged cold into another emergency.

- **Supply Chain level: Knowledge resides in the Processes**

At the supply chain level, knowledge transfer must be both vertical and horizontal; in other words, within the different levels of an organisation as well as among the different organisations participating in the same supply chain. At this level, knowledge is extracted from the people to develop procedures, manuals, and standardised processes that can improve the performance of the supply chain.

The most popular and controversial example at this level is unsolicited donations. Following a disaster, the generosity of the international community is often manifested in many ways. Unfortunately, not all of the efforts are needed, and in fact, many of them create bottlenecks like the large number of planes with donations that arrived into Banda Aceh unsolicited following the Indian Ocean tsunami. For most of these planes, the humanitarian agencies were completely unaware of their content, and had to find a way to receive and offload them without forklifts or proper storage space. This strongly contributed to the creation of a huge bottleneck which significantly perturbed emergency relief operations.

Unsolicited donations can represent a major obstacle to the operation, taking up resources that could otherwise be used to provide better-quality assistance. Organisations have used their knowledge to develop lists of items needed per disaster type, and estimates for quantities, as well as specifications. They have also developed manuals and training modules to

facilitate the processes and quality of delivery (norms for packaging, labeling, storage, loading, etc.)."

Knowledge can also be used to adapt product specifications to meet the needs more efficiently, for instance in defining survival kits. The content is not only a simplified and packaged solution, but kits take the responsibility away from the person who orders them on the minute details that should be included. For example, when someone orders an electricity kit, they will get a generator. The kit is packaged in such a way that a person who has never seen or used a generator before can easily figure out how to use it to meet his or her electricity needs. It will also include all the different fluids and accessories that could be needed, the type of things that a first timer ordering would most likely forget or not know about. Basically the kits are a way of packaging and passing on knowledge.

- **Theater Level: Knowledge Resides in the Context**

This is the big picture level: for example, how do the physical, economic, or social conditions in the country or region affect operations? This could be knowledge about market conditions, regulatory measures, government dynamics, weather conditions, and so on. Knowledge reduces complexity by helping to disentangle the issues affecting the supply chain.

The classic example is knowledge about the cultural context within the theater of operations. For example, while plastic blankets are considered to be warmer and longer lasting, there may be a cultural resistance by recipients who prefer natural fibers. Other examples are the segregation of the genders, awareness of the cast system, or dietary restrictions in communities practicing certain religions.

## **Barriers to knowledge sharing**

The text above highlighted the importance of sharing knowledge, but in practice this is rather difficult within and among organisations at the different levels. Tomasini & van Wassenhove (2009:127) argue the challenge is to share knowledge so that it may become part of the organisation (an asset/competency) and, most importantly, so that it be shared with the community (minimising duplication of efforts). As with most relationships, parties are not willing or ready to share until they see a benefit from knowing what others know. Until then no one is willing to assume the cost/investment in sharing information. Tomasini & van Wassenhove continue by stating that sharing is difficult for the following reasons:

- **Knowledge is power:**

So why share it? One of the spins is to make knowledge exchange a rewarding act by giving proper credit to the sources. Consider why a humanitarian organisation would tell another that they have the cheapest rate to get aid into Afghanistan? The incentive may be to share space when they have less than a full truck load. An important point is to understand what power information provides, and when that power of information is useful to complete the necessary tasks.

- **Exchanging knowledge can be threatening:**

Organizations may be afraid of the negative repercussions of sharing knowledge about themselves. Revealing gaps or insufficiencies in the operations can reflect poorly on their performance. Rather than being penalized for their shortcomings, organizations need to be rewarded for revealing them and finding solutions in a collaborative way. For example, an organization may reveal gaps in their pipeline as an opportunity for others to share their stock and transportation.

- **Unknown cost/benefit ratio:**

What is the value of knowledge and what is the effort needed to acquire it? How to know if the knowledge is a good deal if there is no way of knowing



the value of what is circulated? There is a need to promote popular and relevant ideas. Eventually the usefulness and quality of the information will build a reputation that will attach a value to the source (as it is the case with most news agencies). This is how the UNJLC positions itself as a key player in knowledge management with the weekly bulletins posted on its website.

- **Knowledge is contextual:**

The best knowledge resides where it was conceived, so how valuable would it be when transferred? There is a need to establish contact persons and promote dialogue and exchange. The key is to make that knowledge replicable and transferable to others. For this, the UNJU had information managers that would be in frequent contact with people from different organisations in the field to understand the context.

- **Lack of absorptive capacity:**

How to avoid information overload? Focus on quality and relevance. Through constant validation of the priorities and regular feedback from the users one can focus on the most relevant aspects.

- **Knowledge can become sacred:**

Knowledge becomes entrenched and hard to replace with new ideas and realities. Hence the need to stay on top of the latest developments and be ready to discard old ideas based on dated information. Keep in mind that crises and operations are dynamic with ever-changing needs and conditions.

In conclusion, Tomasini & van Wassenhove (2009:129) state high staff turnover and multiple deployments happening simultaneously lead to an environment where there is little time to codify and transfer experiences. As a result many humanitarian organisations find themselves reinventing the wheel from one deployment to another, missing out on the valuable experiences of colleagues who perhaps lived through similar circumstances earlier.

Tomasini & van Wassenhove (2009: Chapter 3) say knowledge management is one of the key elements in making supply chain a core function of the organisation. Increasingly we see organisations investing in this area as they become more aware of their shortcomings, redesign their processes, and prepare for the retirement of their most experienced and senior staff. Though the knowledge produced within an organisation is irreplaceable and extremely valuable, new sources of knowledge need to be considered to improve performance.

## **2.7 Challenges of integrated business logistics and supply chain management in humanitarian supply environments**

Humanitarian logistics is defined as the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials as well as related information (Thomas and Kopczak, 2005:2). This includes preparedness, planning, procurement, transport, warehousing, tracking and tracing and customs clearance. Activities take place along the whole supply chain from the point of origin to the point of consumption with the aim to improve conditions for people affected. Managing humanitarian supply chain holds unique challenges, unlike commercial supply chains, demand cannot be anticipated (Long and Wood, 1995). Disasters whether they be slow onset protracted hardship or rapid onset emergency responses (the latter is not in the scope of this study) happen anywhere in the world at any time, often in undeveloped regions with poor infrastructure or during political instability, which might necessitate a combination of military and commercial applications. These factors make it difficult to assess demand and supply requirements (Van Wassenhove, 2006). Hence, there is a high need of flexibility as distribution networks have to be set up quickly.

Tomasini & van Wassenhove (2009:131) state the commercial and humanitarian supply chain management can learn from each other through partnerships and

they further explain the process of transferring best practice, one of the main drivers for this type of cross-sector involvement. Please see paragraphs below detailing Tomasini & van Wassenhove's (2009) overview of Private-Humanitarian partnerships, forms of corporate support for humanitarian activities, CSR partnership challenges, value through learning, barriers to exchanging best practices.

### **2.7.1 Private-Humanitarian partnerships**

The reasons for the boom in cross-sector partnerships are simple: humanitarian organizations recognise that the private sector can help with resources and expertise, while the private sector is looking for opportunities to improve its impact on society through responsible actions. High-impact partnerships help to improve the competitive advantage of the parties involved. Such improvement comes as a result of the exchange of best practices and knowledge.

Companies have long supported humanitarian activities, either through commercial contracts or through philanthropic programs, but mostly in their home countries. However, in this era of rapid globalisation of business, disasters like the Indian Ocean tsunami of 2004 have prompted companies to re-examine their roles and consider humanitarian activities in terms of their overall corporate and social responsibility (CSR) strategy. By becoming better corporate citizens these companies believe they can benefit both their business and society, even though risks are involved.

Falling out of favour is the notion that just giving cash and in-kind donations to support humanitarian relief efforts is enough. Companies today are considering marrying short-term relief actions with longer-term disaster response partnerships with the humanitarian sector. When successful, these partnerships have the potential to exploit the core competencies of both business and humanitarian organisations, improve overall disaster preparedness, heighten corporate brand awareness, and, in some cases, contribute to disaster

mitigation. They can also act as an effective forum for the exchange of information, ideas, and best practices that can improve efficiency and, in the case of the private sector, the bottom line. Partnerships also have the potential to deliver fast, effective support during a crisis, and can help build capacity between disasters.

Given the potential rewards of such cross-sector links, they are attracting increasing attention from both the corporate and the humanitarian sectors. Humanitarian organisations, which at one time regarded cash as the only useful form of corporate giving, are now recognising that businesses have more to offer in terms of resources, expertise, and technology. As a result, they are becoming more open to discussions with the private sector and, in some instances, are identifying their ideal partners and making the first approach. Similarly, companies are realizing that they may have something to learn from humanitarians, particularly about being agile and adaptable in difficult circumstances, one of the main strengths of humanitarian organisations. They too are manifesting an interest in initiating a cross-sector dialogue to examine what types of partnerships are feasible and most likely to deliver mutual benefits.

For an increasing number of companies these partnerships are also a visible means of demonstrating to their stakeholders, including employees, customers, vendors, and local communities that they actively subscribe to the concept of social responsibility. CSR has risen in importance over the years and is now an integral part of the business culture of a growing number of global companies. It is increasingly recognised as a key non-financial performance indicator that has the potential to affect a company's reputation as well as its share price. For business to adopt an enhanced CSR strategy and expect to realise short-term business benefits in the face of long-term global needs may be unrealistic, but

that does not lessen the importance of developing such a strategy for the long haul.

It was not until very recently that the private sector stepped in (cautiously and despite a lot of scepticism). One of the key differences are whilst the private sector may be relatively independent of politics, it functions with incentives different from those of the humanitarian sector, like making profit rather than saving lives.

- **Building learning laboratories**

The emergence of CSR has made corporations more aware of the potential gains in areas rarely considered before. Michael Porter argues that corporations can enhance their competitiveness by engaging in partnerships where social and economic values overlap. The aftermath of the 2004 Indian Ocean tsunami amply demonstrated that logistics plays a substantial role in delivering aid in emergencies. Although the scope of this research is not focused on emergency response logistics, there are still many parallel learnings that would also apply to humanitarian programming. The circumstances and settings are very different from private sector logistics, yet they present attractive learning opportunities for private sector partners. For example, companies increasingly need the same sort of skills as relief organisations, given the dynamic demands and disruption risks of operating global supply chains and the central role of logistics in increasing profits when it comes to short-term changes in demand or supply (agility), or in adjusting their design to market changes in the medium term (adaptability). As a result, corporations have realised that while high speed and low cost may be necessary for a successful supply chain, they are not sufficient to ensure a competitive and sustainable advantage over rivals. Such advantage comes only when the supply chain is also agile, adaptable, and aligned.

Unlike the private sector, humanitarian organisations are specialists in being agile and adaptable, implementing complex supply chains under high levels of uncertainty, with limited resources and infrastructure, and often overnight. There's been an increase in private logistics companies participating in partnerships with humanitarian organisations, approaching the latter not only with a charitable intent but also as an opportunity for learning and business development.

In a partnership every joint project either between or during a disaster is an opportunity to learn. Done well, these partnerships can become learning laboratories for both parties. Humanitarian agencies invest equal resources, hoping to enhance their performance and core competencies through interaction with their private sector partners. In operational terms, the humanitarians can mainly benefit from their partners in two particular areas: back-office support for better disaster preparedness, and the movement of key assets during a crisis (food donations, medicines, shelters, or telecommunications equipment).

- **Back-Office Support**

Pedro Figueredo, WFP Regional Logistics Coordinator, emphasises that in emergency operations *"The concern among logistics firms and relief agencies is that we can't feed the beneficiaries or transport the food to them. It's a race against time in the sense that the ports, railways, roads, warehouses and silos all need to be coordinated."* This type of complex and large-scale coordination is neither improvised nor coincidental. In fact, Bernard Chomilier, former Head of Logistics at the IFRC, explains that *"To be prepared, humanitarians need to work not only during disasters but, more importantly, between disasters, developing agreements and establishing policies and processes to operate swiftly during disasters with existing as well as new supply chain partners."*

Between disasters, alignment, as an aspect of preparedness, is one area in which the private sector is able to transfer its knowledge and expertise to the humanitarian sector. Indeed, it has long focused on strengthening relationships with its partners and establishing incentives to improve the performance of the whole supply chain. This includes negotiating agreements with suppliers and service providers, and implementing tools that can provide greater visibility, facilitate communications and reporting, and enable better planning and forecasting.

- **Humanitarians in the forefront**

The front-office activities of the actual relief operation in a crisis or during humanitarian programming remain in the hands of the humanitarian agencies, this being their core competency and primary role. Humanitarian organisations are licensed to operate in conflict zones and disaster areas thanks to their guiding principles of humanity, impartiality, and neutrality, which aim to create a space in which they can operate free of political and economic agendas. But in light of their other stakeholders (donors, the military, governments, suppliers, carriers, implementing partners, and beneficiaries), such a task can be a real challenge. It is important to have systems and processes in place that can facilitate collaboration among stakeholders to keep efficiency at high levels. Help from the private sector can be invaluable here. However, it is also crucial to minimise undesirable outcomes that could contradict humanitarian principles. Therefore, it is better if the military and the private sector do not get actively involved in running humanitarian operations.

During humanitarian programming, private sector partners can assist the humanitarian agencies with readily accessible assets (e.g., airplanes, forklifts, office and warehouse space, call centers, telecommunications equipment) and skills (e.g., programmers, communication specialists, pilots)

to meet demand in the field. This may be pro bono or at cost, helping to keep the overall expense of the operation down and enhancing flexibility and lean agility.

### **2.7.2 Forms of corporate support for humanitarian activities**

Being a good corporate citizen is at the heart of most companies' humanitarian activities, whether this revolves around providing cash, goods, human resources, knowledge and expertise, or a combination of these, each with its pros and cons (as indicated below). Typically, support is provided immediately after a disaster, although there may be a significant disaster preparedness component in some corporate initiatives.

- **Cash**

Cash is still the most important, and often the most appropriate, donation for humanitarian relief and recovery efforts, enabling humanitarian agencies to purchase essential goods and services upfront, mainly relief supplies and transportation. From the corporate point of view the advantage of cash is that the expense is defined, but it also has other less-tangible benefits in terms of return-on-investment. For example, fund-raising activities organised by employees (and inspired by a corporate promise to match the amount raised) can be more effective than other more conventional team-building events. The downside of donating cash is that it requires a certain amount of due diligence on the company's part to determine that the humanitarian agency chosen to receive the cash has a track record (capability), and can provide reliable data about how it manages its funds (accountability).

- **Goods**

When appropriate, in-kind donations may be a useful alternative to cash. However, companies often fail to realise that in-kind donations should be based on demand, as specified either by the government of the affected



country or by a recognized humanitarian agency with existing operations in the area, rather than on what they can supply.

Unsolicited in-kind donations cause bottlenecks and needless expenditure. The key is for companies to work closely with aid agencies, local embassies, or possibly a supply chain partner in the region, rather than launching their own mini-NGO.

- **Volunteers**

Volunteers from the corporate sector, like in-kind donations, may also hinder rather than help relief efforts if the people volunteering are not equipped with the relevant skills, expertise, or knowledge. Technical competence and noble intentions alone are not enough. Volunteers also need to be familiar with the local context, have experience with emergency situations, and preferably fluency in the language of the country in order to be effective from the outset.

- **Partnerships**

Corporate-humanitarian partnerships that share knowledge, expertise, and best practices can result in more efficient ways of dealing with aid distribution, and, especially, disaster preparedness and disaster mitigation. They have significant potential to deliver benefits across the board to the partners and to the people and communities affected. But setting up these partnerships and making them work effectively raises many issues and challenges.

### **2.7.3 CSR partnership challenges**

Most of the obstacles to successful cross-sector partnerships (CSR) result from the cultural differences between sectors. In a 2005 study of 25 humanitarian organisations carried out by INSEAD, five main concerns surfaced:

- *Lack of mutual understanding;*
- *lack of transparency and accountability;*

- *level of commitment;*
  - *roles and responsibilities; and*
  - *relationship management.*
- **Lack of mutual understanding**

Given their different working environments and objectives, each sector has its own context. While commercial and humanitarian organisations may have logistics and supply chain management in common, they each have their own ways of going about it, with different goals and objectives (speed, cost, lives saved, beneficiaries, etc.), decision-making processes (more or less bureaucracy or political sensitivity) and performance metrics. These diverging notions of logistics can create undesirable bottlenecks in the system when they work together.

*Solution:* Specify requests and needs so that contribution channels are predefined and expectations are met when and where needed, according to the most pressing needs. The best time to do this is during non-emergency periods as a means to enhance preparedness and as the potential partner is freer to explain their needs and concerns. During emergencies it may be too late, and too improvised.

- **Lack of Transparency and Accountability**

Motivation for engagement is a gray area of CSR where commercial and philanthropic intentions can easily overlap. The line between the two is fuzzy and can create a conflict of interest between organisations that have not fully agreed on their position in the engagement spectrum. The resulting confusion can lead to understatement, but more often overstatement, of the contribution. If the private sector and humanitarian organizations find themselves in a position where they have to compete for airtime and media exposure, collaboration will simply not work.

Each sector has different values, responds to different stakeholders, and protects its image and reputation in different ways to maintain its license to operate. Humanitarian organisations generally want to remain as neutral and impartial as possible from political and economic agendas, while business wants to be seen creating the highest impact through their involvement.

*Solution:* Agree on responsible public relations and communication strategies to avoid conflicting messages that could compromise the validity of either party. Different strategies can be defined for different levels of engagement in the spectrum

- **Commitment at all levels**

Humanitarian organisations often see their partner fully motivated and engaged at the C-suite level but experience little buy-in from the rest of the organisation. This poses a major problem given that partnerships often start from the top down but grow from the bottom up when the operational levels work out ways to collaborate and transcend their differences. Contact at the operational level provides an excellent opportunity to validate the needs and solutions upon which interaction channels will be built.

*Solution:* Develop engagement rules that define the needs in advance and can be fulfilled by the partnership, along with protocols and guidelines to agree on service levels, and clarify expectations at the different levels and stages.

- **Roles and responsibilities**

Agencies may be reluctant to let private partners take on responsibilities that are critical for their operation or in areas where they feel they can do it best themselves. Likewise, companies want to get involved in areas that are relatively low cost and easy for them to assist and with relatively high visibility (e.g., sending their excess inventory into a disaster or programming

area as quickly as possible while the cameras are still rolling, regardless of how it may fit the needs on the ground). As a result, many opportunities to work together fail, duplication of effort occurs, and each contribution carries a high transaction cost to both parties.

*Solution:* Determine areas to leverage respective competencies and allow each party to focus on where they make the highest impact from their contribution, rather than each one trying to do the most (or the most visible) at every point.

- **Relationship Management**

Lack of an interface to enforce protocols and regulations creates further confusion about when and how to engage with each other. The interface needs to be designed to build trust, foster mutual respect, and develop a common language and goals.

For example, vehicle fleet management is the second largest cost in the humanitarian sector after human resources. While transport companies have a lot of knowledge and experience in this area which they could transfer to humanitarians, doing so requires an interface that can bridge the cultural differences between the two. Initiatives like the Fleet Forum allow humanitarian organisations and the private sector to interact via a broker for best results.

*Solution:* Develop partnerships in non-emergency periods rather than during emergencies (when it may be too late). Building the relationship and getting to know each other requires significant investment on both sides. Pre-negotiated collaboration minimizes the risk of mistakes, false assumptions, and potential confusion, and provides an opportunity for the partners to establish clearer expectations.

#### 2.7.4 Value through learning

Many humanitarian-private collaborations have been designed under the CSR umbrella to exchange best practices as a means to enhance the partners' performance. Through the exchange process each partner builds new knowledge from the learning steps, ultimately creating social and economic value for their sector.

However, creating value through the exchange of best practices demands attention and resources. Successful partnerships have taken this investment seriously with special attention to overcoming the barriers to exchange best practices. When properly done, these exchanges can develop new knowledge in the organisations through the learning process they initiate. Also refer section 2.6 above for development of humanitarian learning.

#### 2.7.5 Barriers to exchanging best practices

Success depends on how well both parties learn from each other. In these cases, learning is the process of developing knowledge that is embedded in the best practices transferred. The challenge is how to reduce the barriers between two different sectors and create a system to effectively exchange best practices. The difference between the two sectors should not be a deterrent for learning or best practice transfer. According to Tomasini & van Wassenhove, research shows that the "not-invented-here" syndrome is not the biggest barrier to learning. In fact, statistics reveal that arduous relations, causal ambiguity, and absorptive capacity are far greater barriers. Consider the following statement as we review the barriers in the following sections:

**Arduous relations:** Ease of communications and intimacy of the overall relationship.

Cultural gaps have been shaped by stereotypes that inhibit the trust between parties. For example, humanitarians exist to save lives, while the private sector is focused on making money. To save lives, humanitarians are willing

to go into dangerous areas at any time and for any length of time, while the private sector may not go the same distance (or will simply go as far as the cameras will follow).

Clearly defined roles and expectations help to break the barriers of stereotypes, but nothing surpasses the benefits of networking and personal relationships. Not surprisingly, several humanitarians expressed that, under pressure, they are more likely to call upon people they know well or at least have met personally.

***Solutions:***

- Establish an interface to share experiences with other organisations and understand each other's culture, incentives, and priorities.
- Develop ambassadors, at different levels, to help bridge the communication gaps and demystify the differences between the two organisations.

**Causal ambiguity:** When the reasons for success or failure in replicating a best practice in a new setting cannot be determined.

Transferring best practices is not about acquiring new knowledge but about taking advantage of existing knowledge. As such, it is important to separate the key elements that make a practice successful from the context in which it occurs. For example, the similarities between warehousing in a relief area and a European distribution center are not always immediately obvious. Such was the case with logistics company TNT, when they were asked to help redesign humanitarian warehousing in Brindisi. TNT transferred their vast knowledge of commercial warehousing, while at the same time gained knowledge of the complexity of humanitarian operations. Later on, TNT was also requested to examine the distribution network in war-torn South Sudan. The transfer of best practices was less obvious due to the complexity of the situation. After 20 years of fighting, primary access to the area was by air,

and new roads had to be built to bring in aid by land at a more sustainable cost. The TNT team required more in-depth analysis before they were able to deliver a reasonable contribution to the UN. The challenge to transfer the knowledge was an opportunity for TNT to refine their knowledge in a new setting with new conditions.

***Solutions:***

- Encourage the exchange and secondment of staff to execute tasks where responsibility and risk are shared.
- Build a common language and use it to reframe one another's needs. This will allow partners to embrace commonalities while becoming more aware and respectful of differences.
- Communicate and evaluate with your partner the internal applications of the lessons learned from the experiences.

**Absorptive capacity:** Inability to exploit outside sources of knowledge.

Humanitarians invest the majority of their capacity in attending to disasters and humanitarian programming with limited human and capital resources, numerous uncertainties, and scarce information. Partnerships can be created to alleviate constraints and improve performance with additional resources and expertise. However, partnerships have a high absorption cost too, which may be counterproductive during disasters. Based on their limited resources, many NGOs have decided not to divert their attention to partnering with the private sector, or to do so through a third party who will manage their private sector relations.

***Solutions:***

- Discuss priorities and the allocation of resources to interaction channels with your partners ahead of time and assess the resources that will be needed from both to work together.

- Develop indicators, with reasonable expectations, to measure the progress of the transfer. Use this to assess continuous improvement throughout the transfer process.
- Recognise that there can be multiple benefits during the learning process, so be open to embracing unexpected positive outcomes. Keep in mind that there is no single method of learning.

There are many learning opportunities that private-humanitarian partnerships offer. However, there are challenges in establishing and maintain these partnerships. According to Tomasini & van Wassenhove (2009), partnerships are not for everyone. They require a substantial investment and encompass a broad set of risks. For some companies, and in some circumstances, less engagement is, in fact, more, and thus organisations should not rule out the alternative option of simply making a cash donation.

## **2.8 Humanitarian supply chain management interfacing with or complemented by military logistics**

Often, famine relief is needed in places where it is less developed and there is a lack of proper infrastructure. The logistics model to be used, must then be a combination of civilian and military aspects. The military would be the ideal partner in these situations due to the infrastructure, expertise, existing processes and mobility they provide. The military also have specialised units which consist of trained personnel to interface between the military and civilian populations, they are experts in law, communications, health, policing and transportation. One of the many operational capabilities they provide is the ability to build essential infrastructure, roads, ports, airports, railways and storage facilities. They can transport personnel and supplies rapidly and provide an ongoing supply of equipment and materials.



Due to the military's sophisticated control and communications processes they are able to provide rapid and complex contingency planning and basic organisational and communications framework for relief organisations.

Unfortunately in countries where political or military unrest is the cause of the required aid relief, the use of military resources is not possible. In these cases the military will only be able to assist to a certain point, thereafter it would be left up to the humanitarian aid relief organisations.

Military logistics comes in very handy when having to provide security for relief supplies, whether it be by air, where air traffic control provisions, airstrip or airport improvements need to be done, or navigation aid provided. Where landlocked countries are at the receiving end, and the only transport available is rail and road, the military can also assist in keeping the cargo safe until it reaches the designated region. Relief supplies may be vulnerable to attack and need protection, as were provided by the UK military in Iraq in March /April 2003, providing a protected gateway for vessels delivering humanitarian assistance. (BBC 2003)

## **2.9 Summary**

Humanitarian supply chain management (HSCM) just like commercial supply chain management needs cash, goods, people and information to execute. However, it is clear that the level of maturity of the policies, processes and systems as well as the additional governance surrounding HSCM does not bode well for a level playing field. Humanitarian logistics and supply chain management have developed into a specialist field of application of typical commercial or business logistics principles. The knowledge base is increasing rapidly with numerous examples and case studies where significant results have been achieved through appropriate implementation in natural and man-made disasters as well as humanitarian development projects.

One could argue that both HSCM and CSCM needs to be effective, which is achieving their goals and objectives. However, the goals and objectives differ vastly between for-profit CSCM and not-for-profit HSCM. One could further postulate that both CSCM and HSCM focus equally on the principles of lean supply, agile supply and efficiency. Therefore, this study will serve to empirically test this notion of how to measure HSCM efficacy.

## CHAPTER 3: METRICS AND PERFORMANCE MANAGEMENT

### 3.1 Introduction to performance metrics and performance management

Reference was made in paragraph 2.2 to Kessler's (2013:20) argument that in business, companies aim to satisfy the customer through quality, service levels and efficient processes, and thus be profitable, whereas in the humanitarian supply chain, the goal is the reduction or prevention of starvation, malnutrition, illness or death. *"This distinction results in a particular problem since humanitarian supply chains involve commercial partners, such as suppliers of food and non-food items or logistics services provider, who are dependent upon commercial success. Humanitarian logistics is thus faced with a conflict between the monetary goals of the commercial sector and the non-monetary goals of the humanitarian sector. (Baumgarten et al 2010: 456)"*, as quoted by Kessler.

In an unpublished manuscript by Gerard de Villiers, previous Chief Logistics Officer at World Vision International, De Villiers stated that humanitarian logistics and supply chain management is not different in concept from commercial supply chain management but the theatre of deployment, is different, the implementation poses different complexities due to the scale and number of stakeholders involved, and the metrics defining success varies vastly. In defining humanitarian logistics, De Villiers explained that commercial supply chains strive to increase profit and return on investment while humanitarian supply chains focus on yield to ensure maximum benefit is provided to the beneficiaries. This is indeed one of the key performance indicators of measuring the impact of humanitarian logistics, but there are more indicators that could be used. Researching these performance indicators is the primary research objective of this study.

Tatham and Christopher (2014: 222) suggest that key performance indicators need not be complicated nor numerous but a starting point could be whether the

right item was delivered to the right place at the right time and at an acceptable cost. The critical need is to assure and measure effective programme outcomes. This implies it is more important to know what to do with the information, than to define, collect and analyse the required data. One important purpose of such information is to identify trends in the sector.

Beamon and Balcik (2008: 14–21) discuss performance measurement in humanitarian relief chains and explain why performance measurement is important. Unfortunately performance metrics and measurement systems have not yet been developed and implemented widely in the relief sector, but it is indeed possible to apply existing performance measurement frameworks for commercial supply chains, in relief chains. The basic questions in humanitarian logistics are the same as for commercial systems:

- How best to measure (what metrics are most appropriate)?
- What are the relationships between the performance metrics and the information and material flow decision variables?
- How are multiple individual metrics integrated into a unified measurement system?

These questions lead to resource, output and flexibility performance metrics with are summarised in Table 3.1.

**Table 3.1 - Summary of relief chain performance metrics**

Resource	Output	Flexibility
<ul style="list-style-type: none"> <li>• Total cost of resources used</li> <li>• Overhead costs</li> <li>• Total cost of distribution (including transport and handling cost)</li> <li>• Inventory investment (value)</li> <li>• Inventory obsolescence</li> </ul>	<ul style="list-style-type: none"> <li>• Total amount of disaster supplies delivered</li> <li>• Total amount of disaster supplies of each type</li> <li>• Total amount of disaster supplies to each region</li> <li>• Amount of disaster supplies delivered to each recipient</li> </ul>	<ul style="list-style-type: none"> <li>• Number of individual units of Tier 1 supplies that an organisation can provide in time period</li> <li>• Minimum response time</li> <li>• Mix of different types of supplies that the relief chain can provide in a specified time period</li> </ul>

Resource	Output	Flexibility
<ul style="list-style-type: none"> <li>and spoilage</li> <li>• Order / setup costs</li> <li>• Inventory holding costs</li> <li>• Cost of supplies</li> <li>• Number of relief workers employed per aid recipient</li> <li>• Number of "value added" hours (direct hours spent on dispensing aid)</li> <li>• Dollars spent per aid recipient</li> <li>• Donor dollars received per time period</li> </ul>	<ul style="list-style-type: none"> <li>• Target fill rate achievement</li> <li>• Average item fill rate</li> <li>• Stock-out probability</li> <li>• Number of backorders</li> <li>• Number of stock-outs</li> <li>• Average backorder level</li> <li>• Average response time (between occurrence of disaster and arrival of supplies)</li> <li>• Minimum response time</li> </ul>	<ul style="list-style-type: none"> <li>• Number of individual units of Tier 1 supplies that an organisation can provide in time period</li> </ul>

SOURCE: Beamon and Balcik (2008)

Performance measurement in humanitarian logistics is critical for securing donor funding, which relies heavily on some form of accountability to ensure that the funds or other donations are indeed used for the saving of lives and reducing human suffering.

Christopher and Tatham, (2011: 65) postulate "As a means of guiding management in subsequent decision making, one might reasonably anticipate that considerable effort would be invested in the design of appropriate performance metrics – but, surprisingly, this does not appear to be the case." Easterly and Pfutze (2008) state that \$2.3 trillion has been invested in foreign aid over the past 50 years, "*there have been fierce debates over how effective this aid has been or could have been*". They continue by arguing the issue of aid effectiveness (that is the extent to which foreign aid actually achieves their goals by reducing poverty, malnutrition, disease and death).

De Leeuw & van den Berg (2011) state it is generally believed that companies applying performance management practices to outperform those that do not

measure and manage their performance. Studies examining the link between performance management and performance improvement implicitly assume that performance management affects behaviour of individuals in an organisation, which then facilitates the achievement of organisational goals. Their study takes a step towards understanding this implicit assumption. They investigated how performance management practices relate to improvement in performance by influencing behaviour of individuals. They focused on operational performance management, i.e. the definition and use of performance measures on the shop floor in production and distribution. They surveyed 102 companies to identify the relationships between performance management practices, shop floor behaviour and improvement in performance. Their research found that there is a positive correlation between the number of performance management practices applied and performance improvement, suggesting that it is not only which practices are applied but also how many. Recommendations emerging from this study enable managers to identify which behavioural changes are desired to improve performance and to select those performance management practices that positively influence the desired behaviour.

### **3.1.1 Prior research**

Research regarding instruments measuring supply chain efficacy has focused mainly on commercial supply chain management, and significant research gaps are still evident regarding what instruments can measure humanitarian supply chain efficacy the most effective way. In the following sections, some of the commercial supply chain management performance publications will be referred to. In doing so, the relevance of the prior research and the opportunities pertaining to humanitarian supply environments will be contextualised.

Samii (2008:53) quotes Beamon & Balcik (Beamon & Balcik, 2008) discuss the challenges for performance measurement in the non-profit sector given the

“intangibility of the services offered, immeasurability of the missions, unknowable outcomes, and the variety, interest and standards of stakeholders.” Despite these challenges, there is a need to measure the performance of non-profits in general and humanitarian organisations in particular.

Samii (2008:53) continues by stating that scholars note that non-profit organisations tend to measure performance in terms of financial and non-financial inputs metrics rather than outputs metrics (Kaplan, 2001 & Henderson et al., 2002). Thomas & Fritz (Thomas & Fritz, 2006) observe that the sector measures itself in terms of how much food it has distributed or how much funding it has raised rather than how many lives it has saved or sufferings it has alleviated. Since such input metrics does not necessarily imply higher levels of services nor higher delivery capacity (Letts et al., 1999), the sector requires a performance measurement framework that can measure how effectively and efficiently it meets its mission.

Although there is an increasing interest in performance measurement of non-profit organisations, to date there have been only two attempts to measure the supply chain performance of relief operations (Samii, 2008:53). More specifically, Davidson (Davidson, 2006) develops a performance measurement framework for relief logistics by proposing four performance metrics. Beamon's (Beamon, 1999) performance measurement framework consisting of resource metrics, output metrics and flexibility metrics to humanitarian supply chains. Davidson (Davidson, 2006) argues that disaster response involves trade-offs between speed, cost and accuracy of an operation. This is because speed increases the cost of an operation and not necessarily accurately meets the requirements of the beneficiaries. To make informed decisions regarding these trade-offs, four indicators are proposed: appeal coverage, donation to delivery time, financial efficiency and assessment accuracy. The appeal coverage helps measure the extent to which an organisation is meeting its appeal in terms of both finding donors and delivering items. The donation to delivery time indicator

helps measure both the average and the consistency of the delivery lead times. The financial efficiency indicators compare budgeted versus actual cost of an operation. These indicators are to help logisticians make better decisions, measure actual achievements against pre-set targets, provide accountability and develop lessons learnt.

Beamon & Balcik (Beamon & Balcik, 2008) propose three sets of metrics to measure the performance of humanitarian organizations during disaster response, namely resource metrics, output metric and flexibility metrics. Different cost centres (suppliers, distribution, inventory costs) comprise the resource metric. Response time constitutes the output metric. Flexibility metrics measures the ability of a humanitarian organisation to respond to different magnitudes of disaster (volume flexibility), time to respond to disasters (delivery flexibility), and ability to provide different types of items (mix flexibility).

The Council for Logistics Management has done much research in the for-profit arena and focused mainly on whether one's logistics operations are enhancing or eroding shareholder value. The SCOR model challenges industry mainly in the following areas:

- Do you have capital tied up in slow moving inventory, funds that should be going to growth initiatives? Can you quickly identify and recover that capital without affecting service?
- Do you know whether you are providing enough or too much service to customers and the impact on your bottom line?
- When a major customer says that your service is not meeting its standards, do you have the information to respond?
- Are you sure that your logistics organisation is aligned with and focused on the company's strategic goals?



The ability to answer questions like these depends on how well you “keep score” in logistics that is, how well you measure the performance of your logistics operations. In today’s business world, effective logistics measures increasingly are separating the leaders from the laggards. Certainly, measurement has become critical to the success of many business operations, manufacturing, engineering merchandizing, and others. Managers in many industries quickly have adopted tools like “balanced scorecards” to monitor the health of their activities and make necessary changes.

The SCOR model continues by challenging why are there such little useful measurements occurring in logistics? There are several reasons:

- The first is that a successful measurement program is harsh concept. It demands commitment of top managers, who must persuade employees, customers and suppliers that the return from measuring performance across the supply chain is worth the substantial effort. In many companies, effective measurement forces a cultural change, one in which people learn to evaluate by numbers and seek improvements across functional boundaries.
- Secondly, the measures used to evaluate logistics performance are often out of synch with corporate strategy. Meanwhile, senior management may have shifted its direction and failed to communicate this to managers located far from headquarters in the warehouses and on shipping docks.
- The third reason effective logistics measurement has failed to take hold is that there are often too many measures being collected. These measures are set independently by functional managers who lack accountability for an entire business process. A procurement manager, for example, looks for ways to reduce inventories. But a store manager who reports to a different division head is not concerned with minimizing inventories. He is rewarded on sales volumes, which means minimizing

stock outs by maximizing inventory. Contradictory logistics measures like this are rampant in organisations.

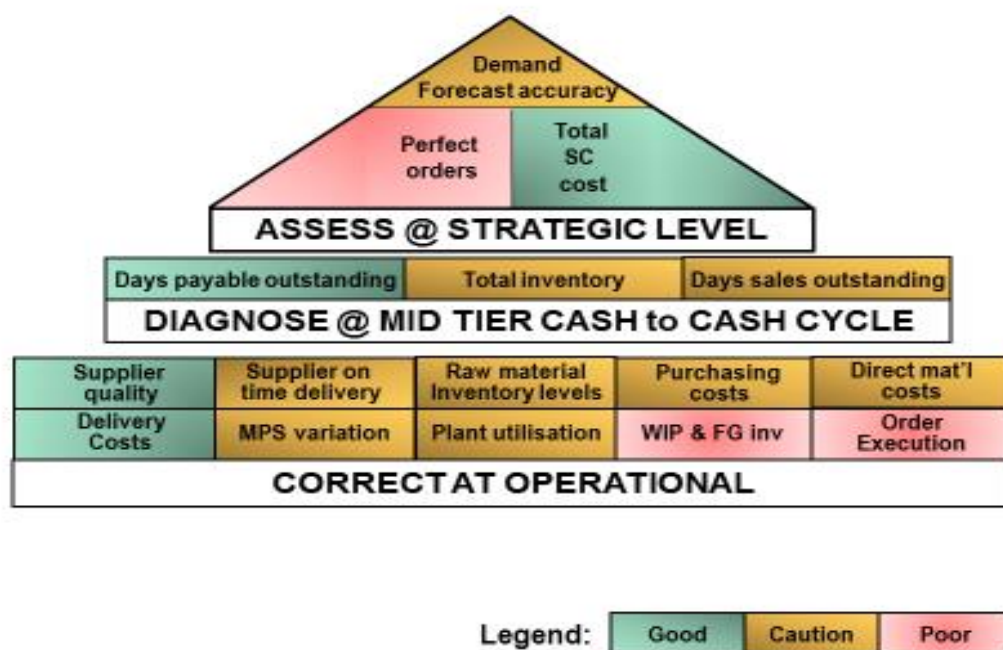
- A fourth reason for the lack of useful measurement is that companies are reluctant to provide information on their performance. Logistics measures appear threatening to workers and their companies who wonder what their boss or their customers will do with the data.
- Lastly, logistics measurement is plagued by problems with language. There can be substantial disagreement over the definition of basic terms, which can remain dormant until there is a problem. For example, to some manufacturers, “on-time” shipments means meeting predetermined dates when their goods leave the plant or the warehouse. To customers, “on-time” means when they take possession of the goods at a specified time and place. This disagreement on basic definitions can cause major misunderstandings.

One of the most significant contributions towards supply chain management metrics was research done by Hofman (2004). ‘***The hierarchy of supply chain metrics***’ by Debra Hofman (2004) postulates that there is a distinctive interdependence between metrics across a supply chain. Hofman states that for many managers, measuring supply chain performance is very difficult because there are so many metrics available and so little guidance on how to best use them. Her research focuses on some essential supply chain metrics, but it does not cover all supply chain paradigms such as the humanitarian supply environment.

Hofman’s research points to a three-tiered hierarchy (refer Figure 3.1) that enables managers to cut through the maze of metrics. With this approach, she argues managers will be able to cut through the chaos and bring order to their thinking. By vertical synthesis, managers will progressively have an enhanced granular view of their supply chain’s performance. Although this is very valuable,

more research is needed pertaining to key aspects commensurate with integrated supply chains of humanitarian programming development, such as donor feedback and the impact on beneficiaries for example.

**FIGURE 3.1: A hierarchy of supply chain metrics**



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SOURCE: Hofman (2004)

Horizontally, Hofman's model proposes to establish the correlation between planning accuracy, optimum order processing, cash to cash cycle optimisation and an ideal inventory model. By expanding the metrics as well as grouping some metrics into key focus areas, one can make a significant contribution to the measurement of supply chain efficacy, and contribute towards a benchmark of next steps en route to world-class best supply chain management practice.

Although Hofman's research has made significant contributions in terms of supply chain metrics, and many of the humanitarian supply chain management

processes are very similar or exactly the same as in the for-profit eco systems, it cannot be directly applied in its totality to the humanitarian supply environment. Although the HSCM environment is equally driven by processes relating to forecast accuracy, perfect order fill, and total supply chain costs, cash-to-cash cycles as embedded in days payable outstanding and days sales outstanding are less important to HSCM. The constructs perceived to be important to CSCM and HSCM respectively will be expanded upon in chapter four.

### 3.1.2 Key terminology and clarification of concepts

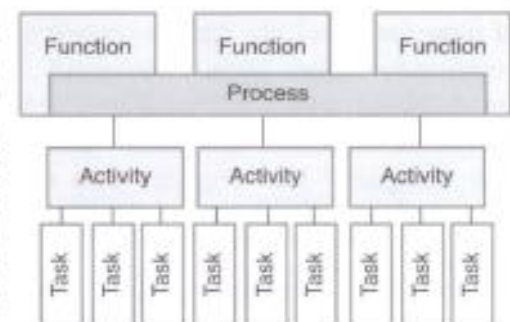
Ackermann and van Bodegraven (2007: 11) state that “ultimately, Supply Chain Management is all about increasing shareholder value, improving profitability, support revenue and market share performance”. According to Ackerman and Van Bodegraven (2007: 11) “The supply chain challenge, in management, in operations, and in administration is to:

- “Distribute more customised product / services
- ...With faster order turnaround
- ...With smaller and more frequent (and perfect) orders
- ...With higher fill rate
- ...With higher quality
- ...With less inventory
- ...At lower cost”

In the following sections, the meaning of certain concepts and terms to be used in this study will be clarified. In doing so, the relevance of the concepts to this research will also be contextualised.

#### **Definition of Terms (Keeble et al, 1999)**

For the purpose of a common ground of understanding and discussion, the following definitions are used for various logistics and business terminology in this study.



**Task:**

A coherent piece of work that can be assigned to an individual or small team and completed in a reasonably short amount of time.

**Activity:**

A collection of tasks that have a common purpose, produce a common output, or address a common theme.

**Function:**

A grouping of related activities contributing to a combined result where trade-offs between the tasks and activities can be made under unified management.

**Process:**

A series of linked, continuous and managed tasks and activities that contribute to an overall desired outcome or result. Processes have a specific starting point and ending point and often but not always, cross functional boundaries. Customers of the process are always at the end point of the process, and they are also often at its starting point.

**Integration (as applied to Process):**

The uniting, combining or incorporation of two or more functions within a company, or two or more processes between two or more companies into a compatible or unified process. This presupposes that joint definitions and agreements concerning the separate functions and processes have been defined and articulated between all parties.

**Logistics:**

That part of the supply chain process that plans, implements, and controls the efficient flow and storage of goods, services and related information from the point of origin to the point of consumption in order to meet customers' requirements. (Council of Logistics Management, 1998)

**Supply Chain:**

A set of three or more organisations directly linked by one or more of the upstream and downstream flows of products, services, finances and information from a source to a customer. (Supply Chain Research Group, University of Tennessee, 1999)

**Effectiveness:**

Effectiveness is the extent to which an activity fulfils its intended purpose or function.

<http://www.qualityresearchinternational.com/glossary/effectiveness.htm>

**Efficiency:**

Efficiency is the extent to which an activity achieves its goal whilst minimising resource usage.

<http://www.qualityresearchinternational.com/glossary/effectiveness.htm>

**Efficacy:**

Power or capacity to successfully produce a desired effect or intended result.

<http://www.thefreedictionary.com/efficacy>

**Key Performance Indicator:**

A **performance indicator** or **key performance indicator (KPI)** is a type of performance measurement. An organisation may use KPIs to evaluate its success, or to evaluate the success of a particular activity in which it is engaged. Sometimes success is defined in terms of making progress towards strategic goals, but often success is simply the repeated, periodic achievement of some level of operational goal (e.g. zero defects, 10/10 customer satisfaction, etc.). Accordingly, choosing the right KPIs relies upon a good understanding of what is important to the organisation. 'What is important' often depends on the department measuring the performance - e.g. the KPIs useful to finance will be quite different from the KPIs assigned to sales or to supply chain management. Since there is a need to understand well what is important (to an organisation),

various techniques to assess the present state of the business, and its key activities, are associated with the selection of performance indicators. These assessments often lead to the identification of potential improvements, so performance indicators are routinely associated with 'performance improvement' initiatives. A very common way to choose KPIs is to apply a management framework such as "Management by Objectives" or the "balanced scorecard" or McKinsey's "7S" framework. These frameworks will be covered in section 3.5.

### 3.2 Types of key performance indicators

**Key performance indicators** define a set of values used to measure against. These raw sets of values, which are fed to systems in charge of summarising the information, are called **indicators**. Indicators identifiable and marked as possible candidates for KPIs can be summarised into the following sub-categories:

- **Quantitative indicators** that can be presented with a number.
- **Qualitative indicators** that cannot be presented as a number.
- **Leading indicators** that can predict the outcome of a process
- **Lagging indicators** that present the success or failure *post hoc*
- **Input indicators** that measure the amount of resources consumed during the generation of the outcome
- **Process indicators** that represent the efficiency or the productivity of the process
- **Output indicators** that reflect the outcome or results of the process activities
- **Practical indicators** that interface with existing company processes.
- **Directional indicators** specifying whether or not an organisation is getting better.
- **Actionable indicators** are sufficiently in an organisation's control to effect change.

- **Financial indicators** used in performance measurement and when looking at an operating index.

Key performance indicators, in practical terms and for strategic development, are *objectives* to be targeted that will add the most *value* to the business. These are also referred to as 'key success indicators'.

### **Identifying indicators of organisation**

Performance indicators differ from business drivers and aims (or goals). A school might consider the failure rate of its students as a key performance indicator which might help the school understand its position in the educational community, whereas a business might consider the percentage of income from returning customers as a potential KPI. The key stages in identifying KPIs are:

- Having a pre-defined business process (BP);
- having requirements for the BPs;
- having a quantitative/qualitative measurement of the results and comparison with set goals; and
- investigating variances and tweaking processes or resources to achieve short-term goals.

Key performance indicators (KPIs) are ways to periodically assess the performances of organisations, business units, and their division, departments and employees. Accordingly, KPIs are most commonly defined in a way that is understandable, meaningful, and measurable. They are rarely defined in such a way such that their fulfilment would be hampered by factors seen as non-controllable by the organizations or individuals responsible. Such KPIs are usually ignored by organisations.

### **Categorisation of indicators - Supply chain management**

Businesses can utilise KPIs to establish and monitor progress towards a variety of goals, including lean manufacturing objectives, diversity spending,



environmental "green" initiatives, cost avoidance programs and low cost sourcing targets. Any business, regardless of size, can better manage supplier performance with the help of KPIs robust capabilities, which include:

- Automated entry and approval functions;
- on-demand, real-time scorecard measures;
- rework on procured inventory;
- single data repository to eliminate inefficiencies and maintain consistency;
- advanced workflow approval process to ensure consistent procedures;
- flexible data-input modes and real-time graphical performance displays;
- customised cost savings documentation; and
- simplified setup procedures to eliminate dependence upon IT resources

Main SCM KPIs will detail the following processes:

- Sales forecasts;
- inventory;
- procurement and suppliers;
- warehousing;
- transport; and
- reverse logistics

Suppliers can implement KPIs to gain an advantage over the competition. Suppliers have instant access to a user-friendly portal for submitting standardised cost savings templates. Suppliers and their customers exchange vital supply chain performance data while gaining visibility to the exact status of cost improvement projects and cost savings documentation.

In practice, overseeing key performance indicators can prove expensive or difficult for organisations. Some indicators such as staff morale may be impossible to quantify. As such dubious KPIs can be adopted that can be used

as a rough guide rather than a precise benchmark. Key performance indicators can also lead to perverse incentives and unintended consequences as a result of employees working to the specific measurements at the expense of the actual quality or value of their work. For example, measuring the productivity of a software development team in terms of source lines of code encourages copy and paste code and over-engineered design, leading to bloated code bases that are particularly difficult to maintain, understand and modify.

### **3.3 Objective or goal setting**

Objective or goal setting is regarded as an effective tool or process for making progress by ensuring that participants have a clear awareness of what they must do to achieve or help achieve an objective. In other words, objective or goal setting helps people understand and unite on what is expected of them. The word goal is also one of the most recognisable words in management for motivational endeavours.

Goal setting theory was developed and refined by Edwin A. Locke in the 1960s. His first article on goal setting theory was "Toward a Theory of Task Motivation and Incentives" which was published in 1968. This article laid the foundation for goal setting theory and established the positive relationship between clearly identified goals and performance.

Goals that are deemed difficult to achieve and specifically tend to increase performance more than goals that are not. A goal can become more specific through quantification or enumeration (should be measurable), such as by demanding "...increase productivity by 50%," or by defining certain tasks that must be completed.

Setting goals affects outcomes in four ways:

1. **Choice:** goals narrow attention and direct efforts to goal-relevant activities, and away from perceived undesirable and goal-irrelevant actions.
2. **Effort:** goals can lead to more effort; for example, if one typically produces 4 widgets an hour, and has the goal of producing 6, one may work more intensely towards the goal than one would otherwise.
3. **Persistence:** someone becomes more likely to work through setbacks if pursuing a goal.
4. **Cognition:** goals can lead individuals to develop and change their behaviour.

In business, goal setting encourages participants to put in substantial effort. Also, because every member has defined expectations for their role, little room is left for inadequate, marginal effort to go unnoticed.

Managers cannot constantly drive motivation, or keep track of an employee's work on a continuous basis. Goals are therefore an important tool for managers, since goals have the ability to function as a self-regulatory mechanism that helps employees prioritise tasks.<sup>[5]</sup> Also Locke and Latham (2002)<sup>[6]</sup>

The four mechanisms through which goal setting can affect individual performance are:

1. Goals focus attention towards goal-relevant activities and away from goal-irrelevant activities;
2. goals serve as an energiser: higher goals induce greater effort, while low goals induce lesser effort;
3. goals affect persistence; constraints with regard to resources affect work pace; and

4. goals activate cognitive knowledge and strategies that help employees cope with the situation at hand.

### **Goal commitment**

People perform better when they are committed to achieving certain goals. Through an understanding of the effect of goal setting on individual performance, organisations are able to use goal setting to benefit organisational performance. Locke and Latham have indicated three moderators that indicate goal setting success:

1. The importance of the expected outcomes of goal attainment, and;
2. Self-efficacy – one's belief that they are able to achieve the goals, and;
3. Commitment to others – promises or engagements to others can strongly improve commitment

### **Goal–performance relationship**

Locke et al. (1981) examined the behavioural effects of goal-setting, concluding that 90% of laboratory and field studies involving specific and challenging goals led to higher performance than easy or no goals. While some managers believe it is sufficient to urge employees to "do their best", Locke and Latham have a contradicting view on this. The authors state that people who are told to "do their best" do not. "Doing one's best" has no external referent, which makes it useless in eliciting specific behaviour. To elicit some specific form of behaviour from others, it is important that this person has a clear view of what is expected from him/her. A goal is thereby of vital importance because it facilitates individuals in focusing their efforts in a specified direction. In other words, goals channel behaviour (Cummings & Worley p. 368). However, when goals are established at a management level and thereafter solely promulgated from the top, employee motivation with regard to achieving these goals is rather suppressed (Locke & Latham, 2002 p. 705). To increase motivation, employees not only

must be allowed to participate in the goal setting process, but the goals must be challenging as well. (Cummings & Worley p. 369)

### **Goal setting and feedback**

Without proper feedback channels, it is impossible for employees to adapt or adjust to the required behaviour. Keep track of performance to allow employees to see how effective they have been in attaining their goals. Providing feedback on short-term objectives helps to sustain motivation and commitment to the goal and without it, goal setting is unlikely to be successful. Feedback should be provided on the strategies followed to achieve the goals and the final outcomes achieved, as well. Feedback on strategies used to obtain goals is very important, especially for complex work, because challenging goals put focus on outcomes rather than on performance strategies, so they impair performance. Properly delivered feedback is also very essential, and the following hints may help for providing a good feedback:

- Create a positive context for feedback;
- use constructive and positive language;
- focus on behaviours and strategies;
- tailor feedback to the needs of the individual worker; and
- make feedback a two-way communication process.

Advances in technology can facilitate providing feedback. Systems analysis have designed computer programs that track goals for numerous members of an organisation. Such computer systems may maintain every employee's goals, as well as their deadlines. Separate methods may check the employee's progress on a regular basis, and other systems may require perceived slackers to explain how they intend to improve.

More difficult goals require more cognitive strategies and well-developed skills. The more difficult the tasks, the smaller the group of people who possess the

necessary skills and strategies. From an organisational perspective, it is thereby more difficult to successfully attain more difficult goals, since resources become more scarce.

### **Employee motivation**

The more employees are motivated, the more they are stimulated and interested in accepting goals. These success factors are interdependent. For example, the expected outcomes of goals are positively influenced when employees are involved in the goal setting process. Not only does participation increase commitment in attaining the goals that are set, participation influences self-efficacy as well. Additionally, feedback is necessary to monitor one's progress. When feedback is not present, an employee might think (s)he is not making enough progress. This can reduce self-efficacy and thereby harm the performance outcomes in the long run.

- Goal-commitment, the most influential moderator becomes especially important when dealing with difficult or complex goals. If people lack commitment to goals, they lack motivation to reach them. To commit to a goal, one must believe in its importance or significance.
- Attainability: individuals must also believe that they can attain or at least partially reach a defined goal. If they think no chance exists of reaching a goal, they may not even try.
- Self-efficacy: the higher someone's self-efficacy regarding a certain task, the more likely they will set higher goals, and the more persistence they will show in achieving them.

### **Limitations**

Goal-setting theory has limitations. In an organisation, a goal of a manager may not align with the goals of the organisation as a whole. In such cases, the goals of an individual may come into direct conflict with the employing organisation.

Without aligning goals between the organisation and the individual, performance may suffer.

For complex tasks, goal-setting may actually impair performance. In these situations, an individual may become preoccupied with meeting the goals, rather than performing tasks.

Goal-setting ideally involves establishing specific, measurable, achievable, relevant, and time-bounded as referred to as S.M.A.R.T. objectives. SMART objectives will be covered in detail in section 3.4.1

One cannot manage what one cannot measure. Hence, it is critical to reflect on various objective setting models that could inform the framework to measure supply chain management efficacy in humanitarian supply environments. Three objective setting models will be discussed in the next paragraphs.

### **3.4 Objective setting models**

Whether it be in one's personal life, or work life, goals and objectives are required if one would like to grow. One cannot manage what you cannot measure. In order to measure one's progress, one requires goals and objectives. These goals and objectives will guide one in the direction that is required to achieve these goals and objectives. By documenting the goals and objectives one will be able to track one's progress against pre-determined time lines.

A very simple but popular model is the GROW Model. This model can be used for goal setting as well as problem solving:

- G – Goal
- R – Reality
- O – Obstacles/Options
- W – Way Forward

In many organisations, people are asked to write work objectives, for themselves and for others, as part of their organisation's performance planning and appraisal process. For some, this is a new experience. For many, it is a difficult one. Fred Nichols' article (2012) elaborates upon the qualities of good work objectives and the process of writing them. The article is concerned with how objectives are derived (i.e., their content) and how they are specified (i.e., their form).

### **Prerequisites for a good objective**

- A good objective should be precise and well defined;
- should be consistent with the values of an organisation;
- must fulfil the measurability criterion in quantifiable terms;
- should be challenging for encouraging better performance and attainment of superior standards;
- should be achievable and must be within the purview of an individual's capability;
- Should be mutually agreed by the manager and the employee concerned; and
- must be time bound and emphasise on team based results.

Many businesses use the SMART model as a management by objectives model to assist in achieving organisational goals.

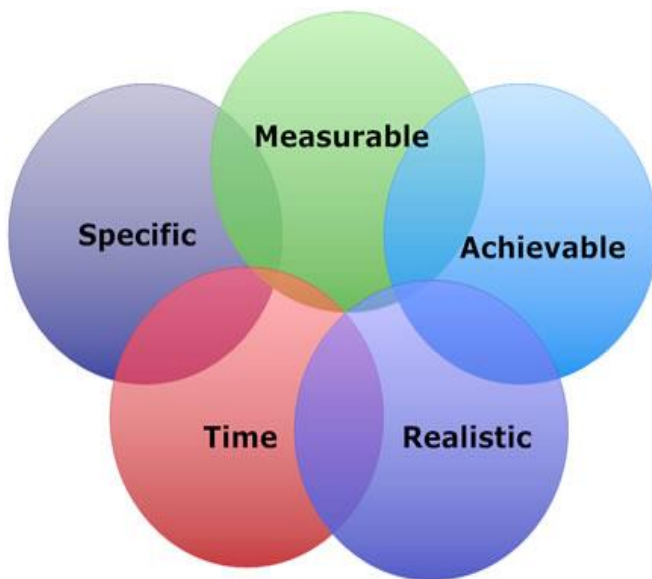
#### **3.4.1 SMART objectives**

All businesses need to set objectives. They are important as they bring focus to organisations. Businesses that have specific aims are usually more successful than those that don't; because a business with objectives knows what it is trying to achieve. Objectives can be set in all areas of the business e.g. sales, production, finance and marketing.



An objective that follows SMART is more likely to succeed because it is clear (specific) so you know exactly what needs to be achieved. You can tell when it has been achieved (measurable) because you have a way to measure completion. A SMART objective is likely to happen because it is an event that is achievable. Before setting a SMART objective relevant factors such as resources and time must be taken into account to ensure that it is realistic. Finally the timescale element provides a deadline which helps people focus on the tasks required to achieve the objective. The timescale element stops people postponing task completion.

**FIGURE 3.2: SMART Objectives**



An effective way to set objectives is to follow the well-known acronym SMART. A SMART objective is:

- Specific;
- Measurable;
- Achievable;
- Realistic; and
- Time scaled.

SOURCE: <http://learnmarketing.net/smart.htm>

#### SMART Objective Example:

The table below uses an example objective from a software company, to illustrate how to apply the SMART objective principle.

**TABLE 3.2 - SMART objective setting for a software company**

**Example:** A software company would like to increase its sales so it has set an objective to increase its market share to 3% in 12 months

Element	How does the objective include this element?
Specific	The objective specifically states that the firm would like to increase its market share instead of something general like be more profitable
Measurable	The objective specifically states that the firm would like to increase its market share to 3%. Stating the percentage provides something that can be measured to show whether the objective has been achieved or not
Achievable	Before setting the objective the firm should have assessed its capabilities and its marketing environment to ensure that the objective is achievable
Realistic	Before setting a 12 month deadline for the objective the firm should have reviewed its resources, employees, competitors and current market share to ensure that an increase in market share to 3% in 12 months is realistic
Timescaled	This element is achieved by the objective including a 12 month timescale

SOURCE: <http://learnmarketing.net/smart.htm>

On the whole, it may be regarded that objective setting process is an important part of performance management process as it defines and manages expectations by establishing an understanding on the part of the role holder about what has to be achieved and at the same time acts as a point of reference during the period of performance review.

Objectives can be broadly classified under the following heads according to the management study guide:

1. **Work Objectives:** These are the key result areas in a role profile of an employee which not only explains what has to be done but also why a job

has to be done. For example, respond proactively to the customer complaints and queries for maximizing customer satisfaction. Effective work objectives clearly define an activity in terms of the results or standards which are to be accomplished. For example, Tata Steel for transforming itself into a growth organisation aligns the key result areas with the corporate strategy at all levels in its performance management module. The organisation rewards and provides career growth opportunities to those employees who perform well in their jobs. In this way the organisation manages the performance of its employees by focusing on work objectives or the KRA's.

2. **Targets:** These are the results which can be measured in quantifiable terms like output, income, cost reduction, service delivered, etc.
3. **Tasks/Projects:** These are the objectives which carry a deadline and should be fulfilled within a specified time frame or can be completed in phases.
4. **Behavioural Parameters:** Behavioural parameters are normally set out within the competency frameworks, identified as desirable and undesirable behaviours which may be useful in the process of performance planning and reviewing. For example, Infosys emphasises on recruiting only those candidates who display a high degree of learnability and at the same time possess special competencies like analytical skills, communication skills and problem solving skills.
5. **Values:** The objective may be to drive all the efforts of the employees and the management team for upholding the core values of the company. In FedEx, the organisation exposes the value of maximizing employee satisfaction for promoting customer satisfaction.
6. **Performance Improvement:** This objective aims at realisation of an improved performance by directing all the attention towards achieving

better results. This objective is highlighted in the performance improvement plans of the employees which describe what steps or measures can be jointly adopted by the managers and the employee for an optimal performance. South West Airlines aims at improving the performance of its employees by providing them appropriate training for handling the requirements of the job challenges, compensating them favourably and keeping them motivated for winning their loyalty.

7. **Developmental Objectives:** These objectives are highlighted in the personal development plans and include the diverse areas of development for an employee which can help in the enhancement of skills and knowledge levels of an employee. In GE, training and development is a continuous process for developing the competencies of the employees and invests in both in-house training programmes and development programmes. Besides this, the company also sponsors its employees for an MBA course in reputed universities.

In conclusion, organisations, businesses and people set objectives everyday often without realising it. If they test their objectives against the SMART principle, they will increase their chances of success. Once a SMART objective has been set, the next step is to write a plan detailing how the objective will be achieved.

### **3.4.2 Management by objectives**

Many organisations set goals and objectives through a formal process known as **Management by Objectives (MBO)** which is an organised and a systematic approach of defining organisational goals and realising them within the available resources. According to the management study guide, the main aim of this approach is to improve organisational performance by aligning the

organisational goals with the individual objectives at all levels and attaining those goals within a prescribed time frame. The system involves continuous monitoring and feedback for improving the quality of outcome.

The chief proponent of MBO system was Peter F Drucker in 1954 in his book entitled 'The Practice of Management'. GE was the first organisation to adopt the MBO method for defining goals. The major focus of this approach is on inviting participation from all the managers in the goal setting process and strategic planning and implementing a range of performance systems which help an organisation to remain on the right path. On the whole, it may be regarded that objective setting process is an important part of performance management process as it defines and manages expectations by establishing an understanding on the part of the role holder about what has to be achieved and at the same time acts as a point of reference during the period of performance review.

Thomson, TM (1972) states the "Management by Objective" (MBO) approach, in the sense that it requires all managers to set specific objectives to be achieved in the future and encourages them to continually ask what more can be done, is offered as a partial answer to this question of organisational vitality and creativity. As a management approach, it has been further developed by many management theoreticians, among them Douglas McGregor, George Odiorne, and John Humble. Essentially, MBO is a process or system designed for supervisory managers in which a manager and his or her subordinate sit down and jointly set specific objectives to be accomplished within a set time frame and for which the subordinate is then held directly responsible.

All organisations exist for a purpose, and, to achieve that purpose, top management

sets goals and objectives that are common to the whole organisation. In organisations that are not using the MBO approach, most planning and objective

setting to achieve these common organisational goals is directed downward. Plans and objectives are passed down from one managerial level to another, and subordinates are told what to do and what they will be held responsible for. The MBO approach injects an element of dialogue into the process of passing plans and objectives from one organizational level to another. The superior brings specific goals and measures for the subordinate to a meeting with this subordinate, who also brings specific objectives and measures that he or she sees as appropriate or contributing to better accomplishment of the job. Together they develop a group of specific goals, measures of achievement, and time frames in which the subordinate commits himself or herself to the accomplishment of those goals. The subordinate is then held responsible for the accomplishment of the goals. The manager and the subordinate may have occasional progress reviews and re-evaluation meetings, but at the end of the set period of time, the subordinate is judged on the results the he or she has achieved. He or she may be rewarded for success by promotion or salary increases or he or she may be fired or transferred to a job that will provide needed training or supervision. Whatever the outcome, it will be based on the accomplishment of the goals the subordinate had some part in setting and committed himself or herself to achieving.

Thomson. TM (1972) continues arguing managers always have been challenged to produce results, but the modern manager must produce them in a time of rapid technological and social change. Managers must be able to use this rapid change to produce their results; they must use the change and not be used or swallowed up by it. Both they and the organisations they manage need to anticipate change and set aggressive, forward-looking goals in order that they may ultimately begin to make change occur when and where they want it to and, in that way, gain greater control of their environments and their own destinies. The objectives should be achievable and challenging. Never set staff unachievable targets – it will be demoralising for them.

The most important tool the manager has in setting and achieving forward-looking

goals is people, and to achieve results with this tool the manager must: first, be able to instil in the workers a sense of vital commitment and desire to contribute to:

- organisational goals;
- control and coordinate the efforts of the workers towards goal accomplishment; and
- help his or her subordinates to grow in ability so that they can make greater contributions.

In some organisations, MBO is a very formal management system with precise review scheduling, set evaluation techniques, and specific formats in which objectives and measures must be presented for review and discussion. In other organisations, it may be so informal as to be described simply as “we get together and decide what we’ve done and what we’re going to do?”

### 3.4.3 McKinsey 7S Framework

The **McKinsey 7S Framework** is a management model developed by well-known business consultants Robert H Waterman and Tom Peter who also developed the *Management by Walking Around* (MBWA) motive, and authored *In Search of Excellence* in the 1980s. This was a strategic vision for groups, to include businesses, business units, and teams. The 7S are structure, strategy, systems, skills, style, staff and shared values.

The model is most often used as a tool to assess and monitor changes in the internal situation of an organisation. The model is based on the theory that, for an organisation to perform well, these seven elements need to be aligned and mutually reinforcing. So, the model can be used to help identify what needs to be realigned to improve performance, or to maintain alignment (and

performance) during other types of change. Whatever the type of change – restructuring, new processes, organisational merger, new systems, change of leadership, and so on – the model can be used to understand how the organisational elements are interrelated, and so ensure that the wider impact of changes made in one area is taken into consideration.

To analyse how well an organisation is positioned to achieve its intended objective, the 7S framework may be used to:

- Improve the performance of a company;
- examine the likely effects of future changes within a company;
- align departments and processes during a merger or acquisition; and
- determine how best to implement a proposed strategy.

The basic premise of the model is that there are seven internal aspects of an organisation that need to be aligned if it is to be successful. The seven interdependent elements are:

#### Hard Elements

- Strategy
- Structure
- Systems

#### Soft Elements

- Shared Values
- Skills
- Style
- Staff



**FIGURE 3.3: McKinsey 7S framework**

Source: [https://commons.wikimedia.org/wiki/Category:McKinsey\\_7S\\_framework](https://commons.wikimedia.org/wiki/Category:McKinsey_7S_framework)

### 3.5 Performance measurement models

Zig Ziglar once said *“if you aim at nothing, you’ll hit it every time”*. He also said *“If you don’t know where you’re going, you’ll probably end up somewhere else”* and added *“A goal properly set is halfway reached”* according to the brainy quote website (n.d.).

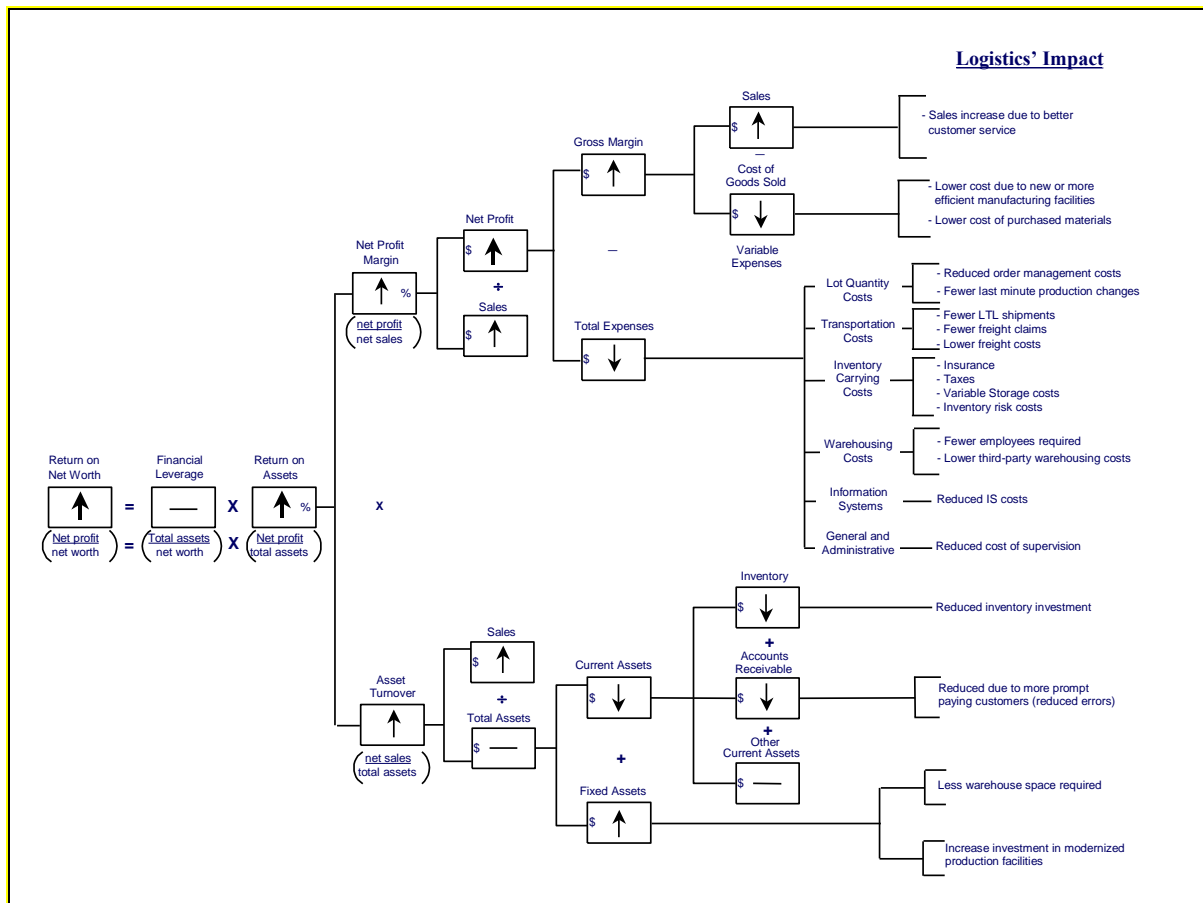
#### 3.5.1 The strategic profit model

The strategic profit model is widely used in commercial for-profit organisation as an instrument to measure integrated supply chain management efficacy, according to Stock and Lambert (2001:668). Bowersox, Closs and Cooper (2002: 576) state that: “While costing and profitability assessment are important aspects of financial controllership, the most critical measure of strategic success is return on investment (ROI). One of the major shortcomings of the strategic

profit model is it ultimately measures ROI, and in humanitarian logistics the return is not monetary.

Stock and Lambert, (2001: 668) debates that *strategic profit model* demonstrates how asset management and margin management will influence both *return on assets* and *return on net worth*, which is the return on shareholders' investment plus retained earnings". Refer Figure 3.4 for a diagrammatic presentation of the strategic profit model.

**FIGURE 3.4: Strategic Profit Model**



SOURCE: Stock & Lambert [2001: 669]

However, Stock and Lambert (2001: 668) adds that it is important to note that both these practises can lead to disastrous results on corporate profit performance. Indeed, large reductions in inventory levels, without considering the impact on other logistics cost, may increase the total cost of logistics significantly. Likewise, reducing accounts receivable without any change in the logistics system can affect the customers negatively, resulting in lower sales revenue. The strategic profit model helps managers determine the overall impact of decisions with regard to cash flows and asset use.

Another criticism of the strategic profit model would be that although it adds great value to for-profit organisations, it will be challenging to apply it in its current form to a humanitarian supply chain. Humanitarian supply chains also need to focus on total expenses, and fixed assets, but is less sensitive to current assets as it often does not have accounts receivable and does not consider gross margins and net profits. Therefore, although many of the principles of supply chain optimisation would also apply to humanitarian supply chains, the strategic profit model cannot be used in its current form to measure humanitarian supply chain management efficacy.

### **3.5.2 The balanced scorecard**

Coyle, Bardi and Langley (2003: 488) states that traditionally performance is measured through key performance indicators. They go on to state: “The classic approach is to say, if you want something, measure it, but at the same time, companies must be careful what they measure.” Coyle et al (2003: 488) continues to argue unintended results from a specific metric is a common problem. They table an example:

A common mistake is to choose only one metric, such as creating the *perfect order* or *perfect shipment*, which needs more measurements surrounding it for counterbalance. The concept of a perfect order is a

good metric, but used alone, it is too one-sided. If there is a breakdown in this metric, it could be due to errors in any department or any person.

The "*Balanced Scorecard*" is a strategic management approach developed in the 1990s by Dr Robert Kaplan and Dr David Norton. Refer Figure 1.5 for a graphical depiction of the *balanced scorecard*. Kaplan and Norton (2008) describe the innovation of the balanced scorecard as follows:

"The *balanced scorecard* retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation"

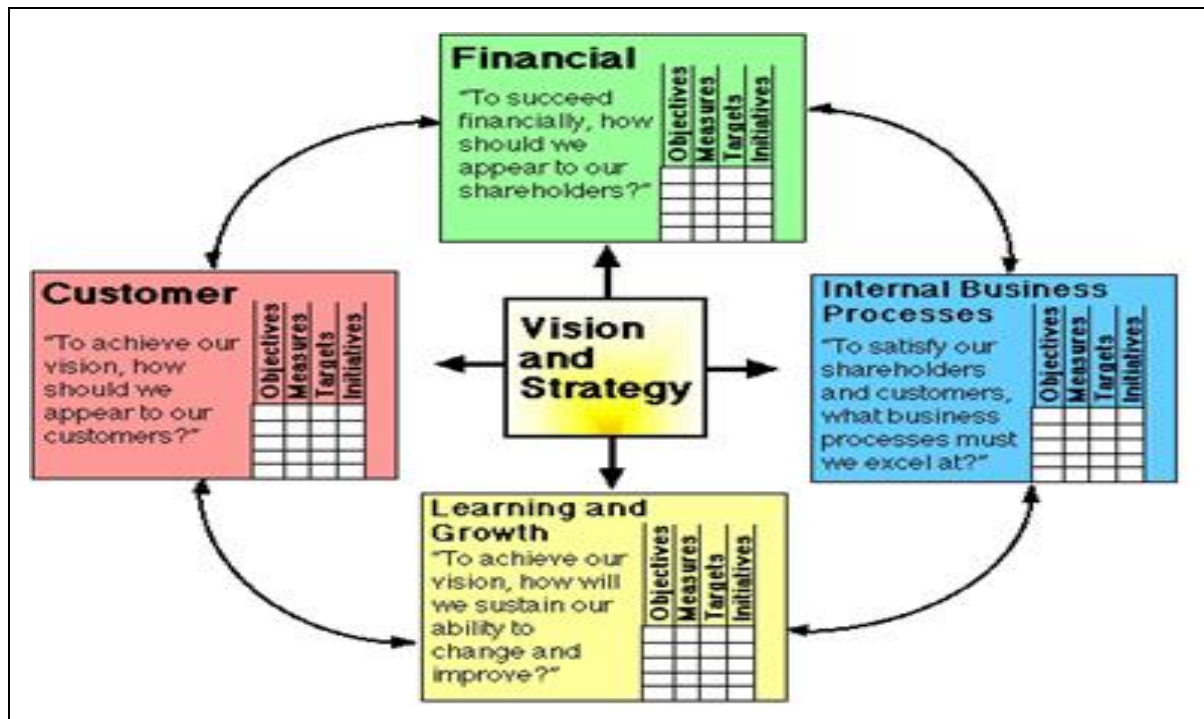
Kaplan and Norton (2008) go on to say the *balanced scorecard* identifies four perspectives from which to view an organisation. These are:

- The learning and growth perspective;
- the business process perspective;
- the customer perspective; and
- the financial perspective.

The *balanced scorecard* is a revolutionary tool to mobilise people to fulfil the company's mission. It is more than just a measurement system. The *balanced scorecard* is a management system that can channel the energies, abilities, and specific knowledge of people throughout the organisation towards achieving long-term strategic goals both to guide current performance and to target future performance. Through using the *balanced scorecard*, management can align individual, organisational, and cross-departmental initiatives and identify entirely

new processes for meeting customer and other stakeholder objectives. The *balanced scorecard* provides a management system for organisations to invest in the long term in customers, in employees, in new product development, and in systems rather than managing the bottom line to ensure short-term earnings only. It changed the way one measures and manages a business. Employees at all levels in the organisation must have access to financial and non-financial measures. However, for humanitarian organisations, the financial metrics will need to include yield to beneficiary, customer metrics will have to include donor and beneficiary points of view, the internal business process and learning and growth perspectives would probably need least changes from the commercial for-profit paradigms.

**FIGURE 3.5: The Balanced Scorecard**



SOURCE: Kaplan and Norton (1996:9)

Bowersox, Closs and Cooper (2002: 168) argue that one of the benefits of the *balanced scorecard* is to measure performance in an integrated way. Integration is key for effective supply chain management. Bowersox et al (2002: 168) are saying:

*“Traditional measurement and reward systems serve to make cross-functional coordination difficult. Measurement systems typically mirror organisation structure. Most reward systems are based on functional achievement. To facilitate internal process integration, new measures such as balanced scorecards must be developed. Managers must be encouraged to view specific functions as contributing to a process rather than a stand-alone performance. A function may, at times, have to absorb increased cost for the sake of achieving lower total process cost. Unless a measurement and reward system is in place that does not penalise managers who absorb cost, integration will remain more theory than practice.”*

### **3.5.3 SCORE Model**

The Council for Logistics Management has done much research in the for-profit arena and focused mainly on whether one's logistics operations are enhancing or eroding shareholder value. The SCOR model challenges industry why it would be important to measure performance? They postulate eight good reasons:

- Objective data provides support for improvement initiatives;
- effective measures are critical to success;
- if a company depends on a process, it has to know its condition;
- measures help illustrate what should and should not be done now;
- measures help companies determine how to stay competitive;
- measures can help improve a company's culture;
- measures can help companies confirm their value to customers; and
- measurement is the only way to control the logistics process.

In pages 92 to 94, the authors of *Keeping Score* continue by stating in the ideal supply chain, there is a high degree of communication. The old maxim about a chain being only as strong as its weakest link is a truism in the world of supply chain and logistics measurement. That is, if a company fails to critically examine the chain from one end to another, it may find itself at the mercy of the weakest member. Any manufacturer that has worked hard to develop a highly integrated, just-in-time manufacturing model is crippled if a key supplier fails to deliver parts at the appointed time, regardless of the health of the company's internal operations.

On page 99, the authors of *Keeping Score* state that even before companies embark on measurement programs, it helps greatly to have everyone who will affect and be affected by the initiative to assume the right mind-set about logistics measurement. Mind-set means having a common understanding of the essential principles or rules of effective logistics measurement. The following checklist of qualities for individual logistics measures themselves that is, a checklist for determining what constitutes a good measure.

The overarching principles of measurements are fairly simple, yet very important (*Keeping Score*. 1999: p118 to 121). These principles should be on the clipboards of everyone attending the first planning meeting for a logistics measurement program. It also might be helpful if a list of the qualities of good measures were on the clipboard. What makes for a good measurement? Research and experience reveal that good measures share 10 basic characteristics. A good measure:

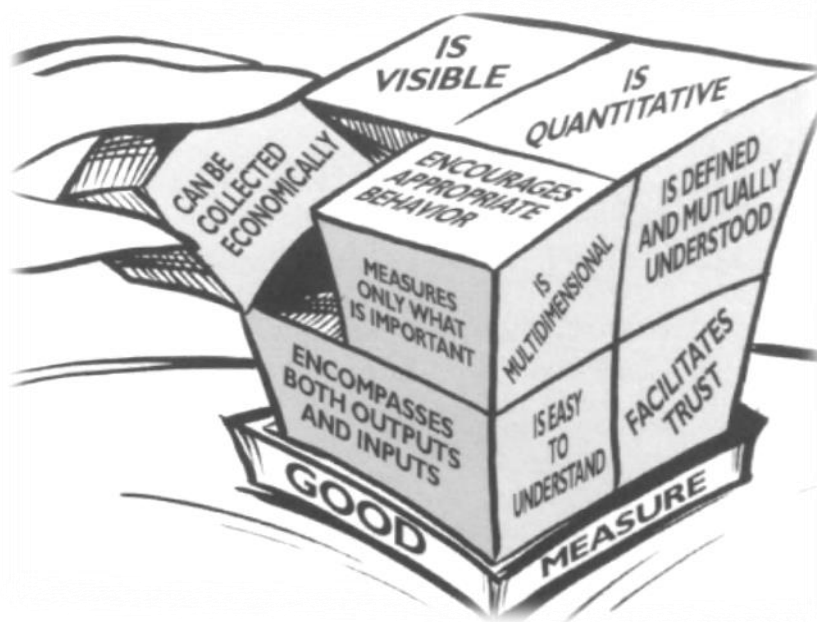
- Is quantitative;
- is easy to understand;
- encourages appropriate behaviour;
- is visible;

- is defined and mutually understood;
- encompasses both outputs and inputs;
- measures only what is important;
- is multidimensional;
- can be collected economically; and
- facilitates trust

**First**, a good measure is quantitative. As just illustrated, it cannot be based on feelings or subjective rankings.

**Second**, a good measure is easy to understand. It has to be able to convey, at a glance, what it is measuring and how it was derived.

**FIGURE 3.6: Hallmarks of good measures**



Source: Keeping Score (1999:120)

**Third**, because of the trade-offs inherent in logistics, a good measure encourages appropriate behaviour. For instance, if a transportation manager is evaluated and compensated on his ability to minimize transportation costs, he



may be inclined to hold orders until they can be combined in one, lower-cost truckload. But, although he has fulfilled his duties based on how his performance is measured, he may have created a satisfaction problem for those customers waiting for deliveries and that of course, would be a major problem in a company competing on the basis of superior service. This characteristic is usually best served by two or three measures that balance the trade-offs.

**Fourth**, a good measure is visible. In other words, everyone involved in the process knows how performance is being measured and everyone has access to performance measures at all times. Such visibility helps companies pinpoint trouble spots, not to affix blame, but to correct the problem so that it does not recur.

**Fifth**, a good measure is defined and mutually understood. A company cannot arbitrarily decide what is good without getting its internal counterparts and/or external trading partners involved in the decision. Instead, all partners must work together to develop standard definitions: What, for example, is “on time”? What does “order cycle time” mean?

**Sixth**, a good measure encompasses both the output and the input to the process. For instance, the ability of a company to deliver goods to a customer on time is necessarily, to a large extent, dependent upon how well the company’s production process is working. A company cannot manage on-time delivery without considering the impacts of order processing, production planning and production scheduling.

**Seventh**, a good measure also measures only what is important. If it does not play a key role in supporting the company’s logistics, supply chain and/or business strategies, it should not be measured.

**Eighth**, a good measure is multidimensional. Because of the complexity of today's processes, effective process measurements must account for three key dimensions: utilisation, productivity and performance. Utilisation is an objective comparison of capacity used versus capacity available meaning how much warehouse space has been used in relation to how much is available. Productivity is the result of dividing output by input, the number of pieces produced by a worker. When a company combines figures for utilisation and productivity, the result is a measure of its efficiency.

**Ninth**, a good measure can be collected economically. The processes and activities being measured are designed for the easy capture of relevant information. The benefits of the measure out-weigh the cost of data collection and analysis.

**Finally**, a good measure facilitates trust. To get all parties to believe in the accuracy of the measure, everyone must agree to and see how the information is collected. Relationships with suppliers or customers are strengthened because of the trust engendered by such measurement.

### **3.6 Bridging to humanitarian supply chain management metrics.**

Commercial supply chain management (CSCM) often measures its results or success in financial terms. The core key performance area of profitability in CSCM is often measured using indicators such as ROI and perfect order fill. However, in humanitarian supply chain management (HSCM) or in not-for-profit supply chain management, the key success factors are often times not a function of financial performance and profitability, but rather philanthropic in nature focusing on the impact that could be achieved through effective and efficient supply chain management. Both commercial and humanitarian supply

chains aim to achieve their respective objectives, but HSCM is more focused on outputs and impact rather than financial results.

“Around half of the African continent’s almost one billion people live on less than US\$1.25 per day and almost 240 million people are affected by chronic hunger. That is more than ever before. Estimates suggest that in the last 50 years one trillion US dollars has been invested in Africa’s battle against hunger disease, water shortages and poverty. However, up to now the international community of states has not managed to provide Africans with the appropriate tools to win this battle.” (Kessler. 2013: 11) One of the tools needed would be a framework to measure the effectiveness and efficiency of humanitarian supply chain management

### **3.7 Aid programming preparedness**

Preparedness is sometimes associated as one of the phases in emergency response logistic management. Although emergency response logistics is excluded from the scope of this study, it may add value to reflect on some similarities because supply chain management in humanitarian supply environments are also in response to disasters, although not rapid onset disasters requiring emergency responses. The former focuses on agile logistics whereas the latter focuses on lean supply chain management. According to General Gus Pagonis (2008), US Army General responsible for logistics in Operations ‘Desert Shield’ and ‘Desert Storm’ leading organisations tend to have both a distinctive operating model and high-performance execution. The execution component implies a need for metrics. I shall approach the research from the perspective that for a supply chain to be excellent, management must be able to differentiate between appropriate metrics for different channel strategies. Supporting the need for measuring supply chain performance, Pagonis, postulated that Supply Chain Executives must know:

- What are the qualitative business goals?

- What are the quantitative supply chain objectives?
- How are they doing?
- What is best practice to improve the situation?

### **3.8 Summary**

This chapter articulates much has been published on performance management in the theatre of general business management and commercial supply chain management but fewer publications have been published on performance management in humanitarian supply chain management. The complexity of performance management has been discussed. Various types of key performance indicators have been discussed and examples of objective setting models have been explained.

The focus of chapter four will be on bridging to the theatre of humanitarian supply chain management and defining the research questionnaire. The purpose of the research questionnaire is to empirically test which supply chain management elements would be most value adding if measured and managed. Humanitarian Supply Chain Management agencies, Non-Governmental Organisations and service providers need to have the diagnostic ability to evaluate a supply chain's maturity, readiness, capability and related risks. Humanitarian relief organisations need to know the nature of demand, readiness and efficient and effective programming.

## **PART 3: EMPIRICAL TESTING RESEARCH**

### **CHAPTER 4: RESEARCH FRAMEWORK**

#### **4.1 Introduction**

In this chapter the author will articulate the thought process of the research design which was used to investigate which metrics ought to be included into a framework to measure supply chain management efficacy in humanitarian supply environments. Empirical research of supply chain management efficacy is rich with commercial and for-profit metrics, however the humanitarian and not-for-profit domain has not been published widely. Evidence in the commercial world has shown that when placing emphasis on supply chain management and logistics, major cost savings and increased efficiency can be achieved. When applying this approach to NGOs, one needs to consider that the environment within which the organisation operates in does play a role and will influence the extent of improvements that can be made. Subjective reality needs to be taken into account, as not just organisations but countries, education, currencies and cultural differences will affect the outcomes. Not-for-profit organisations in humanitarian supply environments have largely been unable to measure and report on their supply chain management performance.

There have been some clear trends in the development of supply chain management best practices. Scholten et al (2009) states in a paper called "Supply chain management concepts and humanitarian aid agencies" that supply chain management plays a critical role in saving lives and improving living conditions as it comprises 80% of relief operations (Van Wassenhove, 2006). However, despite the positive results that have been achieved using supply chain concepts in the commercial sector, humanitarian agencies largely ignore the techniques developed, overlooking possibilities to increase efficiency and effectiveness. Instead they rely on standards used in the for-profit sector in the 1970s and 80s (Fenton, 2003; Gustavsson, 2003; Rickard, 2003).

This research aims at applying supply chain theory to the humanitarian supply theatre. It particularly explores whether the concepts of commercial supply chain management is applicable to the supply chain management of humanitarian aid organisations. It is an exciting opportunity to provide practitioner guidance and to contribute to development of humanitarian business management.

Section 4.2 will articulate the qualitative factors that were used during this research to evaluate and weigh the various supply chain elements as to their relative importance and relevance. The research aims to evaluate a hierarchy of supply chain elements and verify their relevance to efficacy in the humanitarian supply environment.

The empirical research was done through a first round of structured questionnaires. The findings after the first round were then evaluated and where high levels of disagreement was found, these elements were re-evaluated through a subsequent round of research gaining more consensus using the Delphi research technique. The Delphi technique will be explained in section 4.3. Other methods for empirical research working with a limited number of respondents was also considered. Nonparametric statistics was one of these methods that was considered. Nonparametric statistics are statistics not based on parameterized families of probability distributions. They include both descriptive and inferential statistics. The typical parameters are the mean, variance, etc. Unlike parametric statistics, nonparametric statistics make no assumptions about the probability distributions of the variables being assessed. The difference between **parametric models** and **non-parametric models** is that the former has a fixed number of parameters, while the latter grows the number of parameters with the amount of data. Note that the *non*-parametric model does not have any parameters: parameters are determined by the data, not the model.

The design of the research questionnaire will be discussed in detail in section 4.4. The primary source of data was obtained during the structured questionnaires and semi-structured interviews as they offered deep insight into the topic and provided an easy comparison of the results. Therefore, questions were predetermined with forced choices while still allowing for flexibility through soliciting and capturing comments, observations, prior experience and general wisdom. Some of the research participants preferred personal engagement rather than working through the questionnaire in their own time. These requests were accommodated either through face-to-face facilitated discussions or through conference calls. Working through the first round of research, the questionnaire took approximately two hours to complete. The second round of verifying consensus through the Delphi method took 30 minutes to complete. Both these rounds were followed up with informal discussions via Skype calls, telephone calls, electronic medium messaging or face-to-face discussions.

The various supply chain management elements were grouped into the ten (10) key focus areas. The grouping was based on prior research of the logistics planning hierarchy done by Anderson consulting, and a framework for integrated supply chain management by the University of Pretoria. The ten themes or groupings of key focus areas will be discussed in section 4.5.

Following the literature research and interviews with humanitarian supply chain thought leaders over the past several years, sixty five (65) supply chain management elements were identified that were considered worthy of being empirically tested. These 65 elements will be described in section 4.6.

## **4.2 Research questions**

Functional leaders across private and public sectors, “for-profit” and “not-for-profit” organisations alike are being asked to describe and evaluate their programmes by presenting a logical argument on how and why their function,

programme or initiative is addressing a specific customer need and how measurement and evaluation will assess and improve programme effectiveness.

At its simplest, the Government Performance and Results Act can be reduced to a single question: "What are we getting for the money we are spending?" To make GPRA more directly relevant for the thousands of Federal officials who manage programmes and activities across the government, GPRA expands this one question into three on the website:

1. What is your program or organisation trying to achieve?
2. How will its effectiveness be determined?
3. How is it actually doing?

One measure of GPRA's success will be when any Federal Manager anywhere can respond knowledgeably to all three questions. (John A Koskinen. 0886 Once of Management and Budget).

The purpose of this research questionnaire is to provide input into a new framework (what) for Supply Chain Managers (whom) to measure Supply Chain Management efficacy in humanitarian supply environments. Supply Chain Management "efficacy" includes effectiveness, efficiency, seamless integration between functions and business processes to continuously deliver the intended results (why). The scope of this evaluation will delineate humanitarian "not-for-profit" supply chains (where) from commercial "for-profit" supply chains. The scope of this research also focuses on slow on-set natural disasters and not emergency response logistics. This research aims to identify a comprehensive hierarchy of supply chain elements that pertains to humanitarian supply environments that ought to be included into the framework. The research questionnaire will further aim to arrange these supply chain management elements that will differentiate between those elements that:

- are most important pertaining to superior execution of humanitarian programming;



- could have the most significant impact on enhanced donor confidence and increased funding;
- have most significant impact on risk mitigation;
- evaluates whether the supply chain management metric would indicate effectiveness or efficiency;
- would indicate whether the supply chain management function in the humanitarian organisation can directly control or indirectly influence efficacy of a specific element, and
- whether the metrics would be a lead or a lag indicator.

In order for participants to reflect and understand the playing field prior to responding to the research questions a working definition of the outcomes of HSCM was postulated as: "***The desired outcomes of HSCM is to improve programming responsiveness (being effective and efficient in increasing the wellbeing of beneficiaries) whilst mitigating risks and enhancing donor confidence***"

Six questions were asked of each supply chain management element in a matrix format where the respondent had to rate each supply chain management element according to a Likert Scale rating of 1 to 5, or alternatively had to rate each element according to a forced choice between two alternatives. Exceptions were allowed where respondents felt strongly that an element would qualify for each of the mutually exclusive options and they responded that both alternatives would be equally relative and/or value adding.

#### **4.2.1 Relative importance on superior execution**

**Question 'a': "What is the relative importance of this SCM ELEMENT on superior execution of humanitarian programming?"**

An explanation was provided by way of example: “is the humanitarian supply chain effective and efficient in continuously improving the delivery of benefits to the intended beneficiaries?”

For the purposes of this research questionnaire, “the relative importance of this supply chain management element on superior execution of humanitarian programming” pertains to how well does the supply chain perform in relation to:

- superior execution (continuously improving service levels to internal clients) in support of programming needs;
- enhanced capacity, professionalism and scalability of the SCM function (this is perhaps more an outcome than an objective);
- improved yield of donor funding resulting in increased “cash or goods to beneficiary”; and
- visibility of supply chain metrics to inform overall optimisation opportunities and strategies.

#### **4.2.2 Relative importance on superior execution**

**Question ‘b’: “*What could the impact of this SCM ELEMENT be on enhanced donor confidence and increased funding?*”**

The explanation provided by way of example was: “Improved HSCM performance could also relate to increased donor confidence. Therefore, the question “What could the impact of this element be on beneficiaries” in other words, higher donor confidence could lead to increased funding as a result of SCM efficacy.”

For the purposes of this research questionnaire, “the impact of this element on enhanced donor confidence and increased **funding**” pertains to how well does the supply chain perform in relation to:

- enhancing donor confidence and increased funding;

- risk mitigation through good governance and process rigour; and
- improved yield of donor funding resulting in increasing "cash to beneficiary"

#### 4.2.3 Relative impact on risk mitigation

**Question 'c': "Indicate whether the relative impact of this SCM ELEMENT be low or high on risk mitigation?"**

The explanation that was provided by way of example read: "HSCM performance may run better but the beneficiaries may still not benefit. Therefore, improved HSCM performance may also depend on physical and reputational risk reduction."

For the purposes of this research questionnaire, "what could the relative impact of this supply chain management element be on risk mitigation" as it pertains to how well does the supply chain perform in relation to:

- enhanced capacity;
- enhanced professionalism;
- enhanced process rigour; leading to
- financial and reputational risk mitigation through better governance.

#### 4.2.4 SCM effectiveness or efficiency

**Question 'd': "Indicate whether this SCM ELEMENT would be measuring SCM "Effectiveness" or "Efficiency" or both?"**

The explanation by way of example that was provided was "Effectiveness is the extent to which an activity fulfils its intended purpose or function. (In short: Doing the right things). Efficiency is the amount of resource or capacity needed to successfully produce the desired effect or intended result. (In short: Doing the things right)."

#### **4.2.5 Does the SCM function have direct or indirect influence and/or control**

**Question 'e': “Does the Supply Chain Management function have Indirect or Direct influence over this ELEMENT?”**

The supply chain management function would have indirect influence over an element when the execution of duties covered under such an element does not fall directly under the control of the supply chain management function. An example of such an element could be the financial appraisal of an annual procurement budget which could fall under the finance group. Elements that are under the direct control of the supply chain function could be elements such as procurement strategy and supply planning.

It is important to differentiate between the indirect influence of a supply chain management function versus the direct control by such a function of elements in the design of performance measuring criteria. This differentiation is necessary in order to evaluate the maturity of a supply chain function. Immature supply chain management organisations tend to focus on risk mitigation and avoiding audit findings whereas more mature supply chain management organisations tend to be welcomed as respected strategic alliance partners of the business represented at the C-Suite. The latter will lead to more respect and an extension of the accountabilities under the direct control of supply chain management functions and will naturally be more empowered for cross functional integration.

#### **4.2.6 Is this element a lead or lag indicator**

**Question 'f' was: “Indicate whether this ELEMENT would be a "lead" or "lag" indicator.”**

The example provided was: "Can good ethical standards avoid corruption, or would one use good ethical standards as a policy to fall back onto, after corruption has happened?"

A "Lead indicator" informs future state, in other words, what can be expected to happen in future if a lead measure indicates a positive or negative tendency. An example is measuring "suggestions and innovations per person" as an indicator of "staff morale".

A "Lag Indicator" is based on data or information that happened in the past. For example "high absenteeism" could be a lag measure for low staff morale.

### **4.3 Delphi Technique**

The first round of research was followed by a second round, seeking to build more consensus through the Delphi technique. According to Hsu and Sandford (2007), the Delphi technique is a widely used and an accepted method for gathering data from respondents within their domain of expertise. The technique is designed as a group communication process which aims to achieve a convergence of opinion on a specific real-world issue. The Delphi technique is well suited as a method for consensus-building by using a series of questionnaires delivered using multiple reiterations to collect data from a panel of selected subjects. Subject selection, time frames for conducting and completing a study, the possibility of low response rates, and unintentionally guiding feedback from the respondent group are areas which should be considered when designing and implementing a Delphi study.

Theoretically, the Delphi process can be continuously iterated until consensus is determined to have been achieved. The following discussion, however, provides guidelines in order to assist those who decide to use the Delphi process as a

data collection technique when it is determined that additional iterations beyond three are needed or valuable.

In the first round, the Delphi process traditionally begins with an open-ended questionnaire. The open-ended questionnaire serves as the cornerstone of soliciting specific information about a content area from the Delphi subjects (Custer, Scarcella, & Stewart, 1999). After receiving responses, investigators need to convert the collected information into a well-structured questionnaire. This questionnaire is used as the survey instrument for the second round of data collection. It should be noted that it is both an acceptable and a common modification of the Delphi process format to use a structured questionnaire in Round 1 that is based upon an extensive review of the literature. Kerlinger (1973) noted that the use of a modified Delphi process is appropriate if basic information concerning the target issue is available and usable.

In the second round, each Delphi participant receives a second questionnaire and is asked to review the items summarized by the investigators based on the information provided in the first round. Accordingly, Delphi panellists may be required to rate or rank-order (Practical Assessment, Research & Evaluation, Vol 12, No 10 3 Hsu & Sandford,) As a result of round two, areas of disagreement and agreement are identified (Ludwig, 1994, p. 54-55). In some cases, Delphi panellists are asked to state the rationale concerning rating priorities among items (Jacobs, 1996). In this round, consensus begins forming and the actual outcomes can be presented among the participants' responses (Jacobs, 1996).

This study will use two rounds of the Delphi technique to find sufficient consensus after which some elements will be eliminated and henceforth excluded from the framework to measure supply chain efficacy in a humanitarian supply environment. A Delphi study is time consuming and not a straightforward research method. A time limit will be set between the first and

second round of empirical research. It will be necessary to impose a cut off time due to the complexity of the research questionnaire and the time each research associate would have to volunteer to commit. The cut off time will be based on when it will be deemed that sufficient consensus is reached.

#### 4.4 Research questionnaire design

**The purpose of the research questionnaire** was stated as *'to provide input into a new framework (what) for Supply Chain Managers (whom) to measure Supply Chain Management efficacy in humanitarian supply environments. Supply Chain Management "efficacy" includes effectiveness, efficiency, seamless integration between functions and business processes to continuously deliver the intended results (why).'*

**The scope of the research questionnaire** delineated humanitarian "not-for-profit" supply chains (where) from commercial "for-profit" supply chains. **The scope of this research** also focused on slow on-set natural disasters resulting in humanitarian programming and excluded emergency response logistics.

In responding to questions a) to f), respondents were directed to consider a working definition of the outcomes of humanitarian supply chain management (HSCM) namely: "The desired outcomes of HSCM is to improve programming responsiveness (being effective and efficient in increasing the welfare of beneficiaries) whilst mitigating risks and enhancing donor confidence".

After evaluating the myriad of supply chain management elements, the researcher narrowed the scope down to 65 elements that would be empirically evaluated for relevance and significance in the quest to measure supply chain management efficacy. These 65 elements are based on feedback gained through networking with peers following many collective years of exposure to humanitarian supply chain management programs. However, the focus of the

research was to verify through empirical research whether these 65 elements were in fact relevant to measuring humanitarian supply chain management efficacy. The 65 elements were then grouped into ten (10) themes. See section 4.5 for an explanation of the grouping. The 65 elements in 10 groups were then evaluated by research participants via a bank of six (6) questions or criteria. See section 4.2 for more details on the six criteria.

A Likert scale ranging from 1 to 5 was used to rank elements when evaluating their relative importance on superior execution (question a) and relative impact on donor confidence (question b). Mogey, N (1999) states a typical question using a Likert Scale might pose a statement and ask the respondent whether the 'Strongly agree – Agree – Disagree – Strongly Disagree'. This methodology was used although the respondents had to evaluate whether the element would have a 'low–medium–high' importance or impact pertaining their relevance regarding:

- What is the relative importance of this SCM element pertaining to superior execution of humanitarian programming; and
- what could the relative impact be on enhanced donor confidence and increased funding if this supply chain element is managed well;

Mogey (1999) continues by saying the data collected is ordinal meaning they have an inherent order or sequence. However, descriptive techniques such as using the median or mode (not the mean) is probably the most suitable methodology for ease of interpretation.

A forced choice of 'Low' or 'High' was used in the research questionnaire evaluating all 65 elements as to their 'relative impact on risk mitigation (Refer question c).



A forced choice of 'Effectiveness' or 'Efficiency' was used to evaluate the respondents' rating of whether each element would impact on the humanitarian supply chain's effectiveness or efficiency. Respondents also had the option to choose both which would be included as both efficient and effective during the analyses of the research findings in chapter 5. (Refer question d)

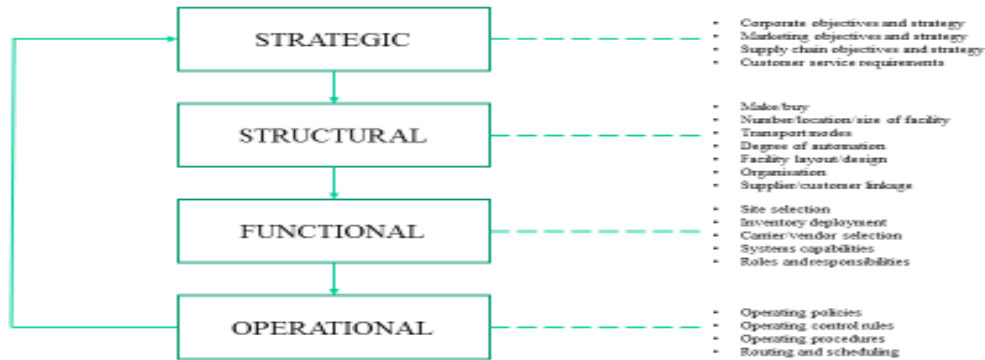
A forced choice of 'Indirect' or 'Direct' was employed addressing the question of whether the Supply Chain Management Function would have indirect or direct control of each of the 65 element. (Refer question e)

Lastly, a forced choice was employed when evaluation whether each element would lead to a 'Lead' or 'Lag' indicator. (Refer question f)

Refer annexure 'E' for a copy of the first round research questionnaire

#### **4.5 Grouping supply chain management activities**

Stock and Lambert (2001: 702) state that logistics decisions are generally made hierarchically but in an interactive manner synthesising between strategic decisions (business objectives, marketing strategy, customer service requirements, etc.) to structural (make/buy, number/location/size of facilities, transportation modes, etc.) to functional (site selection, inventory deployment, carrier/vendor selection, etc.) to operational (operating policies, operating control rules, operating procedures, routing and scheduling, etc.). Refer figure 4.1 for a depiction of the four levels in the logistics decision making hierarchy.

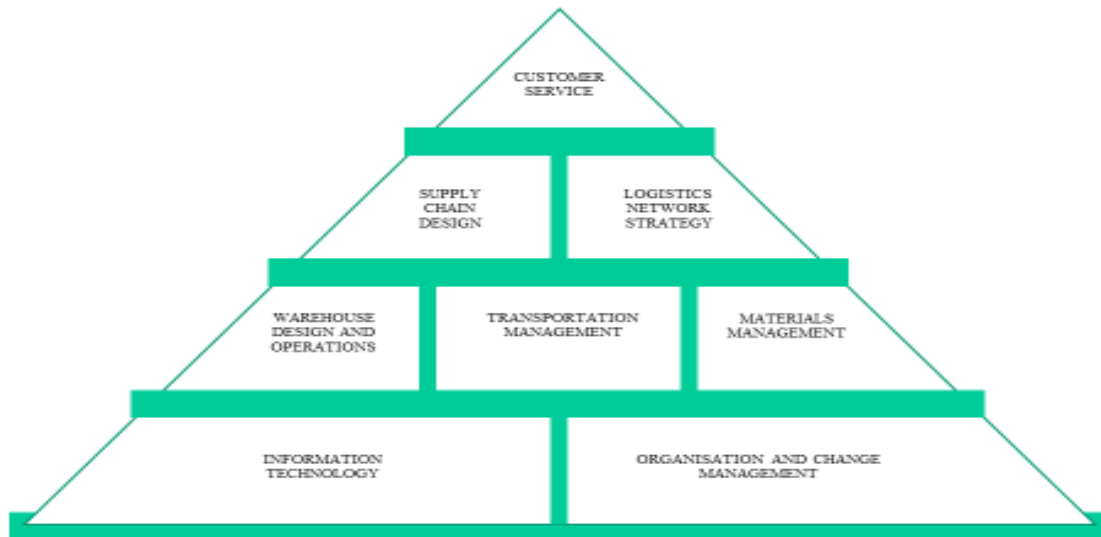
**FIGURE 4.1: Logistics decision making hierarchy**

Source: William C. Copacino. Anderson Consulting. 2000.

Stock and Lambert (2001:703) continue by stating that logistics strategy involves the integration of eight key areas namely:

1. Customer service
2. Supply chain design
3. Logistics network strategy
4. Warehouse design and operations
5. Transportation management
6. Materials management
7. Information technology
8. Organisation and change management

See figure 4.2 for a diagrammatic depiction of these eight key focus areas.

**FIGURE 4.2: Logistics planning hierarchy**

Source: William C. Copacino. Anderson Consulting. 2000.

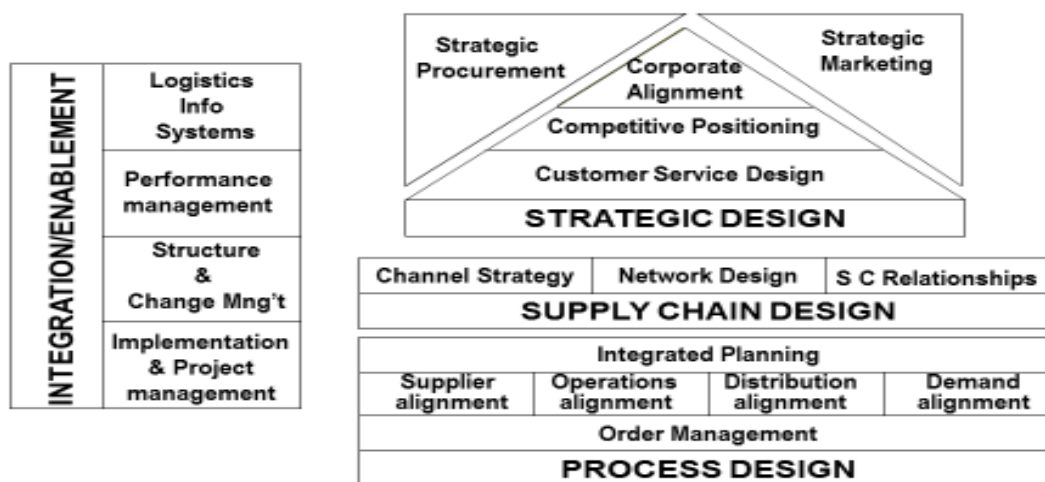
Stock and Lambert (2001:703, 704) conclude by stating any logistics strategy should be based on the above eight key focus areas by addressing the following corresponding questions:

1. What are the service level requirements for each customer segment?
2. How can operational integration be achieved among the various supply chain members?
3. What is the supply chain structure that best minimises the costs and provides competitive service levels?
4. What materials handling / storage technologies will facilitate attaining the service objectives with optimum levels of investments in facilities and equipment?
5. Are there opportunities to reduce transport costs in both the short term and long term?
6. Can current inventory management procedures support more stringent service demands?

7. What information technology is required to gain maximum efficiency in logistics operations?
8. How should resources be organised to best achieve service and operating objectives?

Prof Pieter Nagel, previous Chair in Supply Chain Management at the University of Pretoria developed the following model for the University's MBA programme inclusive of four horizontal integrators. See figure 4.3 for a depiction of Prof Nagel's theory on key supply chain management focus areas.

**FIGURE 4.3: Supply chain management key focus areas**



Source: University of Pretoria

Source: University of Pretoria MBA programme.

In essence, the key supply chain management elements developed by Prof Nagel consist of the same four levels as the Anderson Consulting structure developed by William C. Copacino, but the eight focus areas have been expanded into eighteen focus areas but the operational level was named integrators and/or enablement factors cutting horizontally across the other key focus areas. The key focus areas grouped by Prof Nagel are as follows:

**1. Strategic design level**

- a. Strategic procurement
- b. Strategic marketing
- c. Corporate alignment
- d. Competitive positioning
- e. Customer service design

**2. Supply chain design level**

- a. Channel strategy
- b. Network design
- c. Supply chain collaborative relationships and alliances

**3. Process design level**

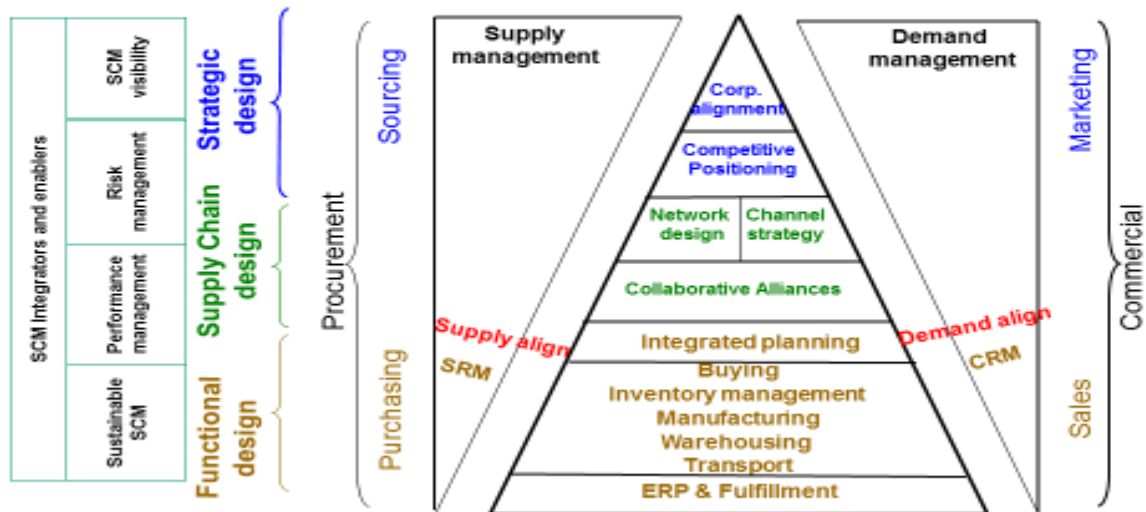
- a. Integrated planning
- b. Supplier alignment
- c. Operations alignment
- d. Distribution alignment
- e. Demand alignment

**4. Integration and / or enablement integrators**

- a. Information and decision support systems
- b. Performance management
- c. Structure and change management
- d. Implementation and project management

The author consulted with many humanitarian supply chain leaders over the past few years and collectively identified sixty-five (65) supply chain management elements that ought to be tested for relevance in terms of importance and impact. See figure 4.4 for a depiction of these ten key focus areas.

**FIGURE 4.4: Supply chain management key focus areas developed for the purpose of this research paper**



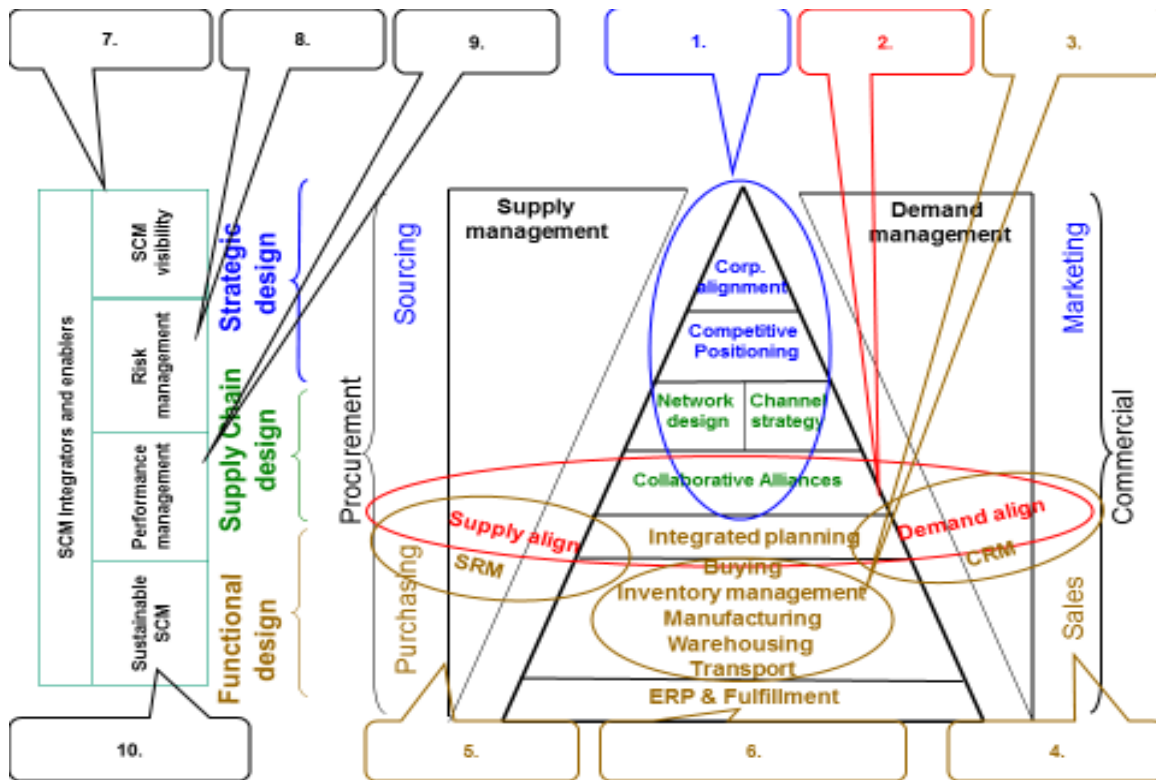
Source: Developed by the author for the purposes of this research.

The 65 supply chain management elements were grouped into ten (10) key focus areas. **The ten key focus areas grouped by the author in consultation with other humanitarian supply chain actors are:**

1. Supply chain management strategy including product and service rationalisation and portfolio management
2. Integrated business planning
3. Logistics integration
4. Demand management (Execution)
5. Supply execution (Plan to Procure to Pay)
6. Fulfilment
7. Supply chain visibility
8. Internal processes and risk management
9. Supply chain performance management
10. Sustainable supply chain management

Refer to figure 4.5 for these ten groupings.

**FIGURE 4.5: Grouping of supply chain management key focus areas for the purpose of this research paper**



Source: Developed by the author for the purposes of this research.

These ten key focus areas will be discussed and explained in the following paragraphs.

#### 4.6 Supply chain management themes and activities

In the following paragraphs, the author will explain which constructs and elements were included in each grouping of key focus area.

Refer annexure 'E' for a copy of the research questionnaire.

#### 4.6.1 Supply chain management strategy including product and service rationalisation and portfolio management

Supply chain management strategy involves understanding the industry drivers of the macro and market environments of such an industry and aligning one's micro and market positioning strategy to optimise one's position. Included in this key focus area of **supply chain management strategy** are themes such as:

- corporate alignment;
- competitive positioning and customer service design;
- network design;
- channel strategies;
- demand design and management including collaborative alliances where appropriate;
- supply design and management including collaborative alliances where appropriate; and
- product portfolio management.

Ethical standards and policies (Q1.1) is included under **corporate alignment**. See below for a description of the element.

##### Element 1.1 - Ethical standards and policies

'Ethical standards' and 'Conflict of Interest' policies are defined and staff are re-committing annually in writing to uphold these.

Supply chain strategy formulation (Element 1.2), demand management strategy (Element 1.4) and demand fulfilment strategy (Element 1.5) are all included under **competitive positioning and customer service design**. See below for a description of the elements.



#### Element 1.2 - The SCM strategy formulated and documented

Differentiating supply chain strategies such as a responsive supply chain for agile responses following a rapid onset disasters vs. lean supply chains commensurate with slow onset programming needs.

#### Element 1.3 – Channel differentiation

Different channels have different operating requirements. Various channel strategies exist and are implemented.

#### Element 1.4 - Demand Management Strategy

The strategy of selecting service levels by supply channel.

#### Element 1.5 - Demand fulfilment strategy

Designing the supply chain to best serve the selected segments and locations. This includes the network design, supply locations, market locations, physical distribution infrastructure, and cost analyses.

Channel differentiation (Element 1.3), procurement strategy (Element 1.6) and globalisation (Element 1.10) are all included under the supply chain design constructs of **network design, channel strategies, and collaborative alliances**. See below for a description of these elements.

#### Element 1.6 - Procurement Strategy

Formulating sourcing strategies by product category and developing appropriate supply strategies.

#### Element 1.7 - Product Development

Influencing the product development process to improve supply chain performance during the life of the product service offerings design to align the SCM solution with the organisational mission.

Product / service development, portfolio management and portfolio rationalisation were included under the construct of **product and service rationalisation and portfolio management**.

#### Element 1.8 - Portfolio Management of service offerings

Optimising the portfolio of different products and services to reduce SCM complexity. This includes strategies such as postponement.

#### Element 1.9 - Product Portfolio Rationalisation

Evaluating product standardisation, for example through standards such as SPHERE for emergency response non-food items.

#### Element 1.10 - Globalisation

Low cost global sourcing vs premium in-country sourcing optimising the trade-off between cost, lead times and service levels.

### **4.6.2 Integrated business planning**

A properly implemented integrated business planning process routinely reviews the current and projected business performance starting with a review of strategy, updated product portfolio changes, updated demand and field requirements, supply resources, and resulting financial effects. The leadership and management team then “re-plans” quantitatively across an agreed-upon rolling horizon (typically 24 months). The re-planning process occurs at least monthly. Implemented correctly, the process focuses at the rolling 24 to 36 month master planning level coordinating between collaborative alliances (leading to virtual inventory and influencing of supplier logistics concepts), balancing **supply** alignment and **demand** alignment through integrated planning.

Demand / need sensing (Element 2.1), demand planning (Element 2.2), supply planning (Element 2.3), demand – supply balancing (Element 2.4), operations scheduling (Element 2.5) and financial appraisal (Element 2.6) are all included under the construct of **integrated business planning**. See below for a description of these elements.

#### Element 2.1 - Demand / Need Sensing

Using various demand signals and forecasting methodologies to capture real need or anticipated need across products and regions. In CSCM, this includes demand signals such as POS data and pipeline inventory in the trade.

#### Element 2.2 - Demand Planning

Demand forecasting across the different products, sales regions and customer groupings.

#### Element 2.3 - Supply Planning

Planning the fulfilment of beneficiary needs from different sources of supply such as inventory, manufacturing and strategic sourcing agreements. This includes concepts such as virtual inventory and pre-stocking.

#### Element 2.4 - Demand / Supply Balancing

Performing trade-offs to balance insourcing vs. outsourcing. ('Make or Buy' strategies) and 'Demand constraining' at 'Rough Cut Capacity Planning levels of accuracy'. Aligning constrained demand with capacity optimisation.

#### Element 2.5 - Operations Scheduling

Scheduling operations to execute supply plans. This includes identifying capacity constraints such as logistics access to logistics nodes, supply capacity and deployable skills in advance.

### Element 2.6 - Financial Appraisal

One needs money, goods and skilled labour to effect humanitarian programming. This element includes justification and quantifying the funds that need to be raised based on anticipated needs and initial assessments.

### **4.6.3 Logistics integration**

Logistics integration involves the functional integration between transport, warehousing, inventory and inbound logistics. Significant service level advantages and cost reductions can be achieved through properly integrated logistics service offerings. However, many of the strategic decisions are taken at corporate supply chain management levels and logistics costs and optimisation is not always taken into account. Logistics strategy, and more specifically distribution strategy, has developed into one of the key elements contributing to the corporate strategic objective of optimising the balance between service levels and total logistics costs. Collaboration across the distribution channel is one of the methods to enhance customer service, whilst simultaneously reducing total logistics costs, thereby repositioning the exponential cost of service relationship.

Transport and distribution (KFA 3.1), clearing and forwarding (KFA 3.2), warehousing and facility management (KFA 3.3) are all included under the construct of **logistics integration**. See below for a description of these elements.

### **Key Focus Area 3.1 - Transport management**

#### Element 3.1.1 - Global Supply Chain Integration

Developing a global supply chain strategy across different trading zones and continents.

Element 3.1.2 - Developing global logistics strategies

Develop global logistics solutions that can move products across the world including freight consolidation and corridor optimisation.

Element 3.1.3 – Multi-Modal Solutions

Seamless integration between road – rail – water – air modes of transport.

Element 3.1.4 - Transport Operational Management

Managing transport operations from sales order to final delivery.

Element 3.1.5 - Managing Transport Risk

Managing all risks related to international transport of products, this includes aspects such as hazardous chemicals (HAZCHEM) regulations.

Element 3.1.6 - Reverse Logistics

Managing product and packaging returns through reverse logistics processes.

Element 3.1.7 - Fleet Management

Total fleet lifecycle management of assets being deployed during programming. This element includes vehicle repatriation after completion of a program.

**Key Focus Area 3.2 - Clearing & Forwarding**

Element 3.2.1 - International Trade

International trade regulations which controls the flow of product and funds across different trading zones.

Element 3.2.2 - Clearing

Clearing imports through the customs process which includes efficient processing of taxes and levies.

Element 3.2.3 - Forwarding

Forwarding and pre-clearing documentation to facilitate smooth change of ownership in compliance with all customs rules.

Element 3.2.4 - Incoterms

Intentional selection of incoterms to optimise freight density and to minimise risk.

Element 3.2.5 - Invoicing and Terms

Invoicing and payment of taxes and import levies related to imported products. This includes payment types and terms as well as trading in foreign currency.

Element 3.2.6 - Disbursements

Making payments of all costs, taxes and levies to the correct parties. This includes accurate cost allocations.

Element 3.2.7 - Foreign Currency & Foreign Exchange management

Optimising the management of foreign exchange for imported products in terms of exchange rules. This includes currency hedging.

**Key Focus Area 3.3 - Warehouse & Facility Management**

Element 3.3.1 - Facility location

Network optimisation commensurate with the various channels taking cognisance of the in-country capacity constraints and regulatory obstacles.

Element 3.3.2 - Facility design & Layout

Design the physical flow, infrastructure and skilled labour to be used in facilities.

Element 3.3.3 - Facilities Operational Management

Managing all operations within facilities, such as receiving, picking, packing, staging and despatch.

Element 3.3.4 - Inventory control

Controlling all inventory to limit losses through shrinkage or damage.

Element 3.3.5 - Materials Handling

Handling of different materials through the warehousing process to minimising risk and optimising cost efficiency.

**4.6.4 Demand management**

An annual operating plan will jointly commit the humanitarian organisation to a consensus programming forecast. This forecast drives the demand planning. In turn this demand planning and forecasting is shared with manufacturers and suppliers. Concepts such as “demand design”, “demand pull” and “supply push” are understood and appropriately embedded in the supply chain design. This will in turn also assist in improving the overall lead time.

Donor relationship management (Element 4.1), and order management (Element 4.2) are both included under the construct of **demand execution**. See below for a description of these elements.

Element 4.1 - Donor Relationship Management

Establishing donor relationships for the purpose of achieving the demand plan through adequate funding, demonstrating acceptable governance and providing feedback in accordance with donor conditions.

Element 4.2 - Order Management

Ensuring fulfilment of field requirements.

**4.6.5 Supply execution (Plan to Procure to Pay)**

Supply execution is based on the principle of plan to procure to pay. It includes all process steps from needs analysis, market solicitation, bid evaluation,

requisitions, approval of requisitions, sourcing, ordering, receiving, inventory management, monitoring of supplier service levels, on-time payment, product returns, guarantee, post delivery services and supplier relationship management.

Purchasing planning (Element 5.1), the Requisition process (Element 5.2), Purchasing Execution (Element 5.3), and the accounts payable process (Element 5.4) are all included under the construct of **supply execution**. See below for a description of these elements.

#### Element 5.1 - Purchasing planning

Annual procurement plans are in place. Procurement provides input on price, quality specifications and delivery lead times. These APP's are reviewed quarterly. Implementation plans are tabled for each emergency response and are 80% accurate.

#### Element 5.2 - Requisition process

Managing the sourcing execution process from need identification to payment.

#### Element 5.3 - Purchasing Execution

No untoward influence to accept non-competitive bids are tolerated.

#### Element 5.4 - Accounts payable process

Accounts are paid on due dates (not early or late) and no product or service are held back due to accounts being on hold.

### **4.6.6 Fulfilment effectiveness and efficiency structures**

Fulfilment and order processing involves the co-ordination and allocation of inventory to requestors of products or services with a view of providing internal and external customers with the required products or service on time.



Generally, fulfilment management is supported by an enterprise resource planning (ERP) system but in the humanitarian sector, lack of availability of such ERP and related decision support systems often presents the humanitarian sector with one of its greatest challenges.

Supplier's manufacturing strategies and logistics concepts (Element 6.1), consignment design (Element 6.2), and execution management (Element 6.3) are included under the construct of **fulfilment and efficiency structures**. See below for a description of these elements.

Element 6.1 - Align supplier's manufacturing strategy with own desired logistics concept.

Determine which supplier strategy selecting from 'make-to-stock', 'assemble-to-order', 'make-to-order', 'purchase-to-order' and 'engineer to order' will best suit the desired channel strategy.

Element 6.2 - Consignment design

Consignment and packaging design aligning specifications with receiving facility capacity, capability and limitations.

Element 6.3 - Execution Management

Managing the execution process including quality management systems.

#### **4.6.7 Supply chain visibility**

Davidson (2006:2) argues this inability to measure humanitarian supply chains are due to an inability to centrally capture data from operations. Davidson continues by stating “with the recent development and implementation of information technology systems that can support the logistics functions of the organisations, the data is now available to measure performance, but what is still lacking is a central framework of metrics that measures performance

according to the organisation's strategic goals." Supply chain visibility also includes having insight into spend by category, demand and supply visibility and access to key performance dashboards.

Systems and technology implementation (Element 7.1) and systems and technology risks (Element 7.2) are included under the construct of **supply chain visibility**. See below for a description of these elements.

#### Element 7.1 - Systems & Technology Implementation

Using systems and technology to enable synchronised supply chain processes and functions through shared information.

#### Element 7.2 - Systems & Technology risks

Mitigating risks of poor connectivity through technologies such as 'off-line' capability of information systems.

### **4.6.8 Internal processes and risk management**

The purpose of risk management and mitigation is to identify risks and address these through avoidance or mitigation to acceptable levels. Risk can be mitigated through implementing policies and procedures, organisational structures ensuring segregation of duty, competency and skills development and compliance and quality assurance programmes and audits. However, mitigating the risks of supply interruptions also requires focus on elements 8.1 to 8.5.

Demand stability (Element 8.1), supplier performance (Element 8.2), economic climate (Element 8.3), labour climate (Element 8.4) and inbound supply length (Element 8.5) are all included under the construct of **internal processes and risk management**. See below for a description of these elements.

Element 8.1 - Demand stability vs. volatility

Lack of demand visibility or huge demand volatility may lead to excess inventory and / or obsolescence.

Element 8.2 - Supplier performance and reliability

Supplier performance is monitored and supplier dashboards are shared. Corrective actions are taken and suppliers are switched out if poor performance continues.

Element 8.3 - Economic climate of supply market

Determine whether the supply market is a buyer's or seller's market.

Element 8.4 - Labour climate in the country and origin

Is the labour situation stable, highly unionised, militant and demanding leading to poor efficiencies and high producer price inflation?

Element 8.5 - Inbound supply chain length and exposure to interruptions

With the focus on global sourcing, supply lead times and variation in delivery reliability is sometimes sacrificed to achieve better global pricing.

**4.6.9 Supply chain performance management**

Beamon and Balcik (2008: 14–21) state that the basic questions in humanitarian logistics are the same as for commercial systems:

- How best to measure (what metrics are most appropriate)?
- What are the relationships between the performance metrics and the information and material flow decision variables?
- How are multiple individual metrics integrated into a unified measurement system?

High level performance indicators (Element 9.1.1), Balance Scorecard (Element 9.1.2). Level of outsourcing and collaborative alliances (Element 9.2), Contract Management (Element 9.3), Cost Management (Element 9.4), Process Optimisation (Element 9.5), Improvement concepts (Element 9.6), Change Management (Element 9.7), and Risk and Compliance Management (Element 9.8) are included under the construct of **supply chain performance management**. See below for a description of these elements.

#### Element 9.1 - Key performance indicators

Using performance indicators across different levels to measure and improve performance.

##### Element 9.1.1 - High level key performance indicators

The 'Strategic Profit Model' is often used to measure 'RETURN ON ASSETS' as a key measure of success for Commercial SCM. Would 'CASH TO BENEFICIARY' be the key measure of success in Humanitarian SCM?

##### Element 9.1.2 - Balance Scorecard

The 'Balanced Scorecard' is often used to measure Financial, Customer, Internal processes and Learning and growth KPA's.

#### Element 9.2 - Level of outsourcing and collaborative alliances

Implementing outsourcing as a mechanism to improve performance of the supply chain.

#### Element 9.3 - Contract Management

Managing contract compliance for all types of supplier contracts.

Element 9.4 - Cost Management

Cost modelling of the supply chain to identify the high cost drivers and to reduce the overall cost of operations. This includes concepts such as activity based costing (ABC) and total cost of ownership (TCO).

Element 9.5 - Process Optimisation

Improving the performance of supply chain processes through process improvement techniques.

Element 9.6 - Improvement concepts

Improvements concepts such as JIT, LEAN to improve supply chain performance.

Element 9.7 - Change Management

Implementing transitions through change management interventions.

Element 9.8 - Risk and Compliance Management

Managing supply chain risks and ensure compliance to risk procedures.

**4.6.10 Sustainable supply chain management**

Sustainable supply chain management entails aspect such as triple bottom line accounting (economic – social – environmental), balanced approached between local and global sourcing, highest ethical standards for conducting business, achieving least total cost of ownership over the whole life cycle of products. Aspects such as blocked party screening, sourcing from vendors who employ fair labour practises avoiding exploitation and child labour are also included.

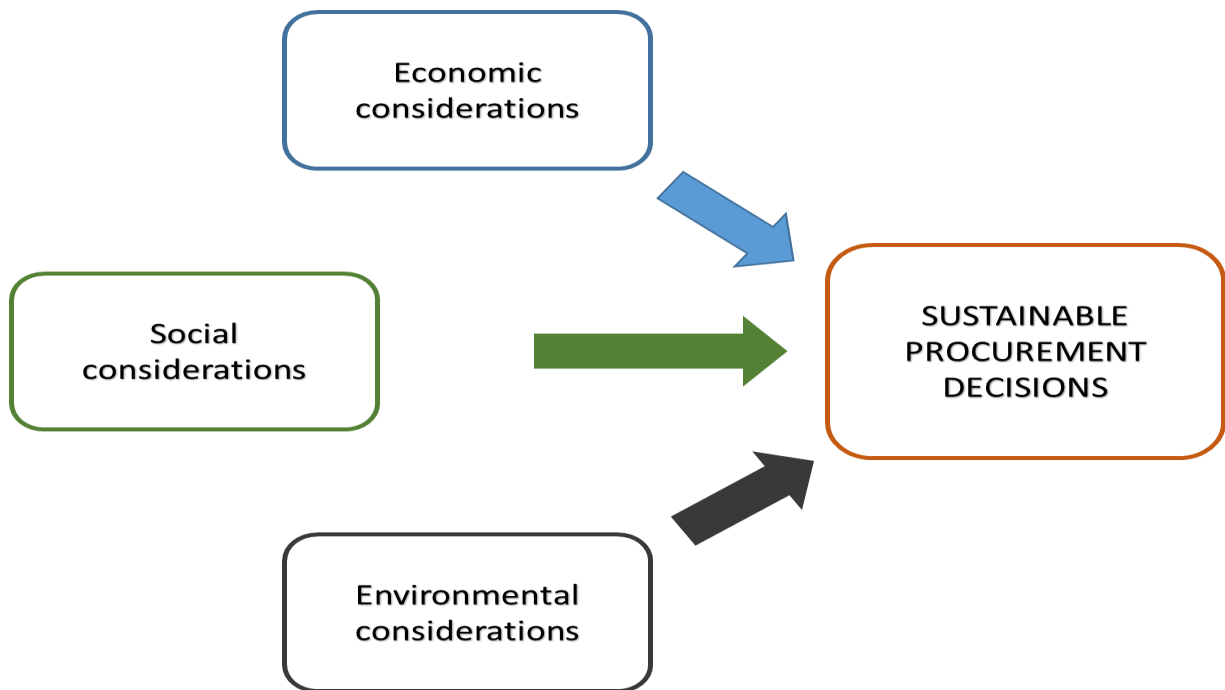
Sustainable and ethical procurement consists mainly of factors such as:

- A balanced approach between international sourcing for best value for money propositions balanced with loyalty to the local supply market for

the purposes of supporting the local economy and not to “dump” product into the local markets.

- Seek to achieve value for money through the whole-life basis considering the environmental, social and economic consequences of procurement decisions.
- Staff must uphold the highest ethical standards commensurate with the values of using donor funds to enhance the life of the intended beneficiaries

**FIGURE 4.6 – Ethical and sustainable procurement**



Source: Developed by the author

Green supply chain management (Element 10.1), supply chain sustainability (Element 10.2), supplier development (Element 10.3) and corporate and social responsibility (Element 10.4), are all included under the construct of

**sustainable supply chain management.** See below for a description of these elements.

Element 10.1 - Green supply chain management and triple bottom line accounting.

Harmful economic, social and environmental impacts of supply chain operations to the environment is limited. The 'whole life basis' is considered when making SCM decisions. This includes biodiversity and disclosure of Carbon Emissions.

Element 10.2 - Supply chain sustainability is ensured

Ensure sustainability through using alternative resources to support the supply chain. SCM decisions are not made on economic factors alone.

Element 10.3 - Supplier development programmes are implemented

Engaging with small, medium, and micro enterprise (SMME) suppliers in developing economies to mainstream these into the formal sector. (BBBEE in South Africa and Frontier Market Development Internationally]

Element 10.4 - Corporate and social responsibility programmes are implemented

Human rights are respected. Fair labour practices are monitored and child labour is avoided. Working conditions of own organisation and those of SCM partners are uplifted.

#### **4.7 Conclusion**

A copy of the initial research questionnaire is attached in **annexure 'E'**. The research framework contains 65 supply chain management elements, grouped into ten themes of key focus areas. One can clearly see how each element will be tested for relevance whether to be included into the final framework pertaining to its:

- relative importance pertaining to superior execution of humanitarian programming;
- relative impact that the element could have on enhanced donor confidence and increased funding;
- significance relating to impact on risk mitigation;
- contribution toward measuring effectiveness or efficiency;
- level of control by the humanitarian organisations' supply chain management function [within the organisation](#), and
- whether measuring the element would be a lead or a lag indicator.



## **CHAPTER 5: DATA COLLECTION AND ANALYSIS**

### **5.1 Introduction**

This chapter will synthesise between the various data sets presenting the data in such a way that it would be useful to inform humanitarian supply chain management practices. This research investigated and evaluated the relevance of 65 supply chain management elements. These 65 elements were the output of field experience and face to face meetings with a variety of humanitarian actors over many years. This can be viewed as the first round of research albeit not scientifically tested which compelled the need for scientific empirical validation.

This validation study was conducted using the Delphi technique allowing for two rounds of systematic collection and interpretation of data. Using the Delphi technique, the findings of the previous round are summarised and feedback between rounds is filtered eliminating some elements based on the objective interpretation of expert opinion consensus. If there are contradictions in responses, these become the focal point of the next round with the aim of building understanding and achieving consensus (Helmer 1967). The main focus of the Delphi technique is to build consensus amongst the opinions of the respondents.

The first round of the analysis provided the full list of 65 supply chain management elements which was based on subject matter expert input. Respondents were asked to rate all 65 elements in accordance with the research questionnaire as described in chapter four. The respondents were promised feedback following the data analysis after round one and their commitment was requested to participate in round two.

The objective of the second round was to share those elements where a high standard deviation was recorded during round one, reflecting insufficient

consensus between the respondents. Their opinion was required to re-evaluate their respective options (choices). They were given the feedback of the average consensus between the 32 respondents after the first round and given the choice to either change their original ratings or maintain their original ratings. They were requested to provide feedback and/or comment immaterial to whether they chose to keep or change their ratings. These comments together with the comments received after the first round, were incorporated into the research findings which will be covered in chapter six.

Thirty-two (32) respondents participated during the first round and 21 of the 32 during the second round. These respondents are not geographically located in the same region or country. Refer to annexure 'D' for the demographics of the research respondents. Respondent confidentiality and anonymity was guaranteed throughout the research and individual names and representing organisations will not be revealed.

## **5.2 Descriptive Information**

Standard deviation was used as the descriptive statistical methodology to evaluate whether sufficient consensus was achieved between respondents and whether it would be necessary for the elements to be subjected to another round of empirical evaluation to ascertain sufficient consensus. High standard deviation was used as indicative of significant differences in opinion between the various respondents. Of the 65 SCM elements, 23 (35%) elements had standard deviations equal or below 1.0, 20 (31%) elements had standard deviations greater than 1.0 but lower than 1.1, and 22 (34%) elements had standard deviations equal or greater than 1.1. The researcher followed the logic of re-evaluating 22 (34%) of the 65 elements being a third of the elements that had a standard deviation of greater than 1.1. seeking more consensus during the second round using the Delphi technique. In symmetric unimodal distributions,

such as the normal distribution, the mean (if defined), median and mode all coincide. For example, if it is known that they are drawn from a symmetric distribution, the sample mean can be used as an estimate of the population mode.

- [https://en.wikipedia.org/wiki/Mode \(statistics\)](https://en.wikipedia.org/wiki/Mode_(statistics))

The **mode** is the value that appears most often in a set of data. The mode of a discrete probability distribution is the value  $x$  at which its probability mass function takes its maximum value. In other words, it is the value that is most likely to be sampled. The mode of a continuous probability distribution is the value  $x$  at which its probability density function has its maximum value, **so the mode is at the peak.**

Like the statistical mean and median, the mode is a way of expressing, in a single number, important information about a random variable of a population. The numerical value of the mode is the same as that of the mean and median in a normal distribution, and it may be very different in highly skewed distributions.

The mode is not necessarily unique, since the probability mass function or probability density function may take the same maximum value at several points  $x_1$ ,  $x_2$ , etc. The most extreme case occurs in uniform distributions, where all values occur equally frequently. When a probability density function has multiple local maxima it is common to refer to all of the local maxima as modes of the distribution. Such a continuous distribution is called multimodal (as opposed to unimodal). [https://www.en.wikipedia.org/wiki/Mode \(statistics\)](https://www.en.wikipedia.org/wiki/Mode_(statistics))

### 5.3 Research results of initial survey

The empirical research of humanitarian supply chain management elements as detailed in chapter four, will be discussed in the following paragraphs. Firstly, the relative grid position using a nine grid matrix pertaining to relative

importance on superior execution and impact on enhanced donor confidence following the first round of research will be discussed in section 5.3. Secondly, the elements identified for a second round re-evaluation due to their respective high standard deviation will be discussed in section 5.4.

The dimension for **relative importance** (on the horizontal axis) has been defined in chapter four as; “*what is the **relative importance** of this SCM element on superior execution of humanitarian programming?*” The dimension of **impact** (on the vertical axis) has been defined as; “*what could the impact of this SCM element be on enhanced donor confidence?*” Elements that were rated high or medium on either importance and/or impact, were highlighted in green in the nine box grid matrix below (refer table 5.3.1). Twenty-three (23) SCM elements were rated high on relative importance as well as high on impact. Twenty- eight (28) SCM elements were rated high on relative importance but medium on impact. These **fifty-one** (51) SCM elements (captured in the green grid boxes in table 5.3.1) will be included in the framework. However, **sixteen** (16) of these fifty- one (51) will be re-evaluated during a second survey due to the relatively high level of variation between the respondents. None of the SCM elements were rated high on impact and medium or low on relative importance.

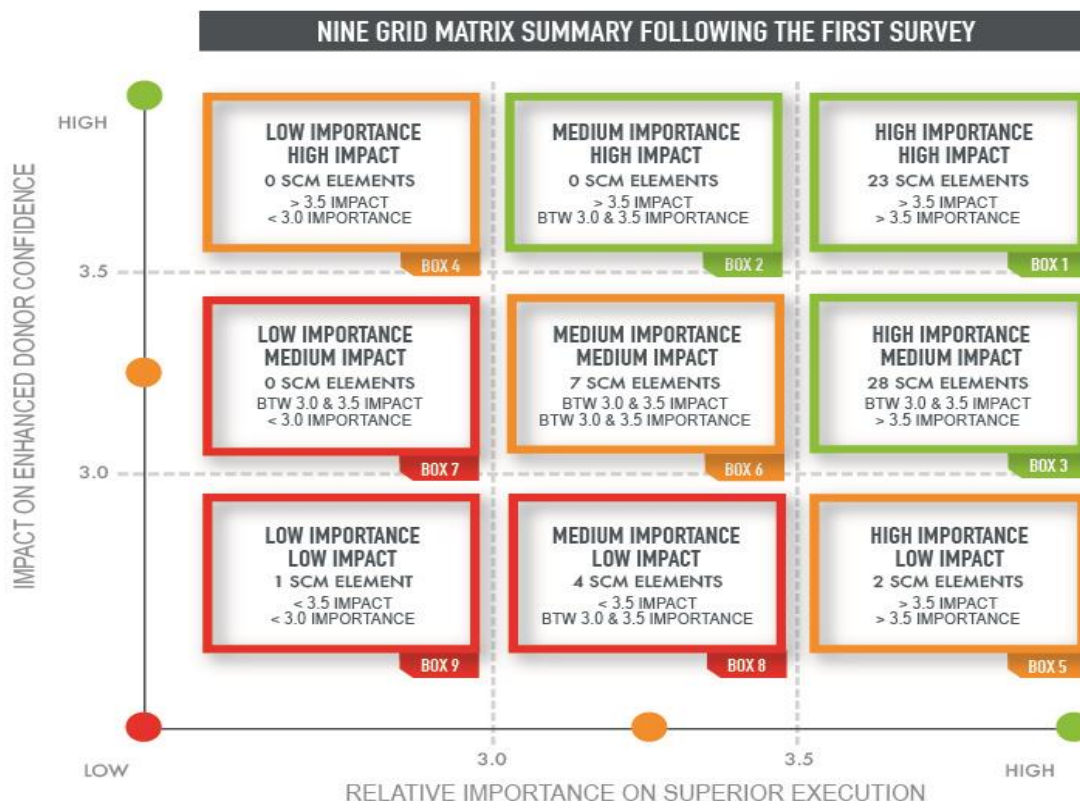
**Two** (2) SCM elements were rated high on relative importance but low on impact, and **seven** (7) SCM elements were rated medium on relative importance as well as medium on impact. These **nine** (9) elements (captured in the orange grid boxes in table 5.3.1) will also be included in the initial framework, however, **two** (2) of these **nine** (9) elements will undergo a second round empirical research evaluation aligned with the Delphi technique as described in chapter four due to the high standard deviation indicating disagreement between the respondents.

**One** (1) SCM element was rated as low on relative importance and impact and another **four** (4) were rated medium on relative importance but low on impact.

These **five** (5) SCM elements (captured in the red grid boxes in table 5.3.1) could be excluded from the framework. However, **four** (4) of these **five** (5) SCM elements had a standard deviation in excess of 1.1, and these **four** (4) will be re-evaluated due to the high level of disagreement between the respondents.

**None of the sixty-five (65) elements were excluded from the framework following the first survey** but **sixteen** (16) of the elements that fell into the green grid boxes, **two** (2) of the elements that fell into the orange grids boxes and **four** (4) of the elements that fell into the red grid boxes (total of 22 elements) was re-evaluated during the second round.

**Table 5.3.1: Nine grid matrix summary following the first survey**

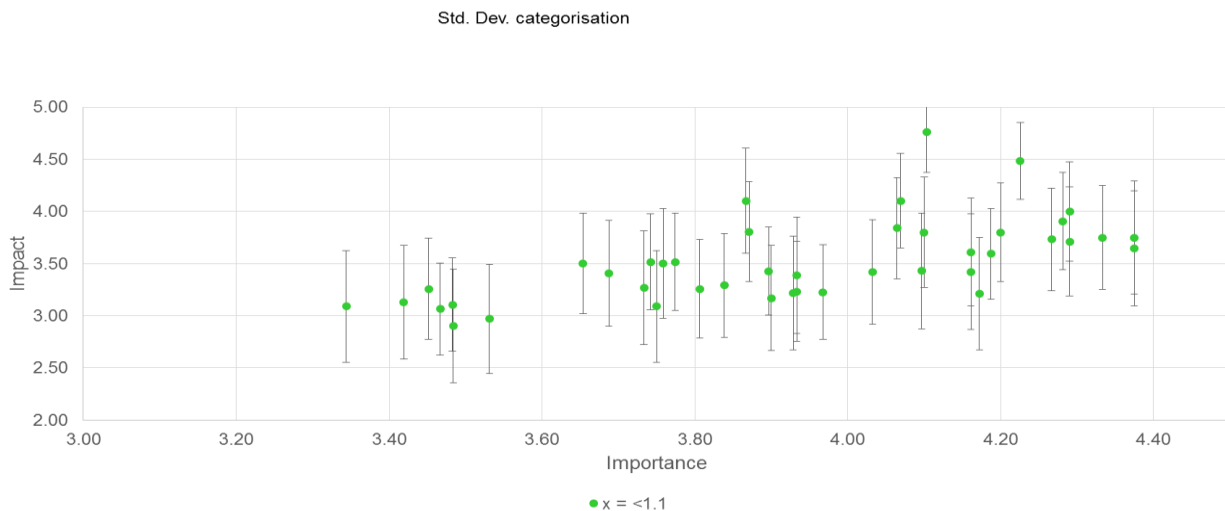


SOURCE: DEVELOPED BY THE AUTHOR FOR THE PURPOSES OF THIS THESIS

See figure 5.3.1 below for a scatterplot depicting the positioning of **forty-three** (43) SCM elements where the standard deviation was equal or less than 1.1. The length of the lines depicts the magnitude of the standard deviation. Sufficient consensus has been reached between respondents on these SCM elements and these SCM elements are therefore not being subjected to further evaluation during the second round.

**Figure 5.3.1: Scatterplot depicting standard deviation of equal or less than 1.1**

#### Standard Deviation ( $X = < 1.1$ ) – 43 SCM Elements



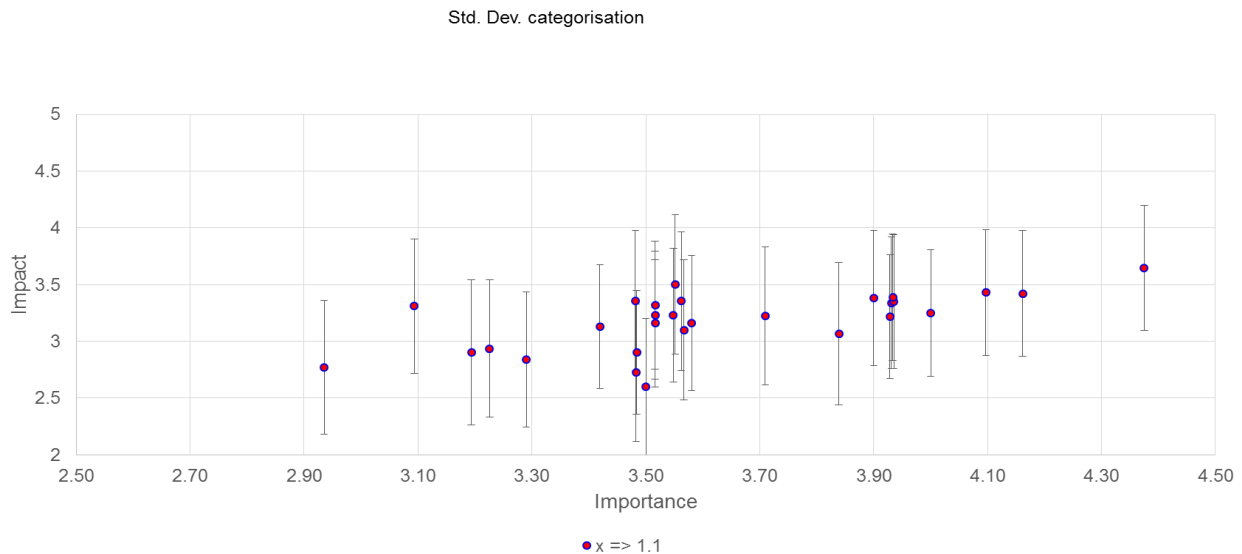
Source: Developed by the author for the purposes of this thesis

See figure 5.3.2 for a scatterplot depicting the positioning of **twenty-two** (22) SCM elements where the standard deviation is greater than 1.1. The length of the lines depicts the magnitude of the standard deviation. Insufficient consensus has been reached between respondents on these SCM elements. The relative high standard deviation is indicative of significant differences in rating between

the various respondents and these SCM elements will be subjected to a second round of empirical evaluation.

**Figure 5.3.2: Scatterplot depicting standard deviation greater than 1.1**

### Standard Deviation ( $x = > 1.1$ ) – 29 SCM Elements



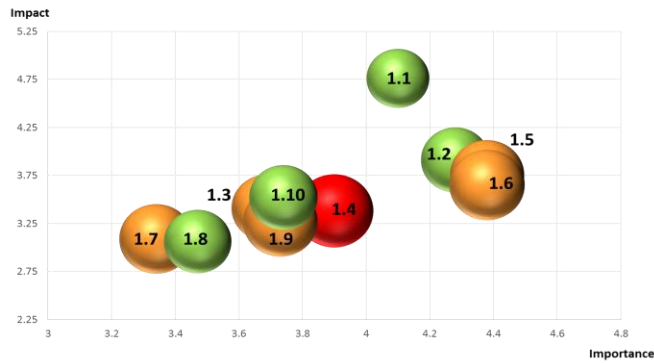
Source: Developed by the author for the purposes of this thesis

Refer to the charts below for a graphical representation of the SCM elements measured under each of the ten (10) **key focus areas**. The **numbers in the bubbles** refer to the **element reference numbers**. The grid position indicates its **relative importance** of superior execution of humanitarian programming of these elements on the x-axis and the **relative impact** on donor confidence leading to increased funding of these SCM elements on enhanced donor confidence on the Y-axis. The size of the bubble indicates the standard deviation between the respondents. Standard deviations in excess of 1.1 are indicated in red.

### 5.3.1 Supply chain management strategy

#### CHART 5.3.1: Standard deviation of responses to Strategic SCM elements

KFA 1: Chart 1: Standard deviation of responses to strategic SCM elements



The red bubble indicates a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position relative to importance and impact.

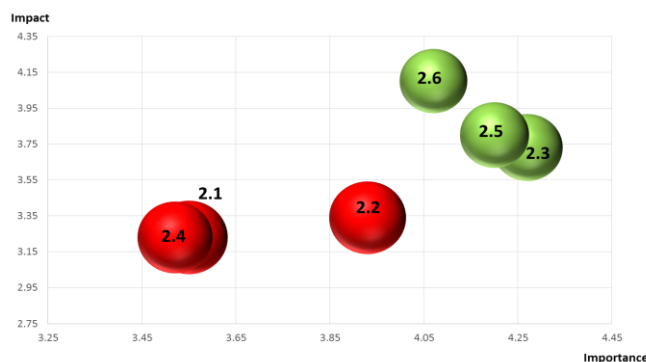
Therefore, SCM element 1.4 will be re-evaluated and the

results of the second round will be discussed in section 5.4.1

### 5.3.2 Integrated business planning

#### CHART 5.3.2: Standard deviation of responses to Integrated Business Planning elements

KFA 2: Chart 1 Standard deviation of responses to Integrated Business Planning



The red bubbles indicate a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position relative to importance and impact.

Therefore, SCM elements 2.1, 2.2 and 2.4 will be re-

evaluated and the results of the second round will be discussed in section 5.4.2.

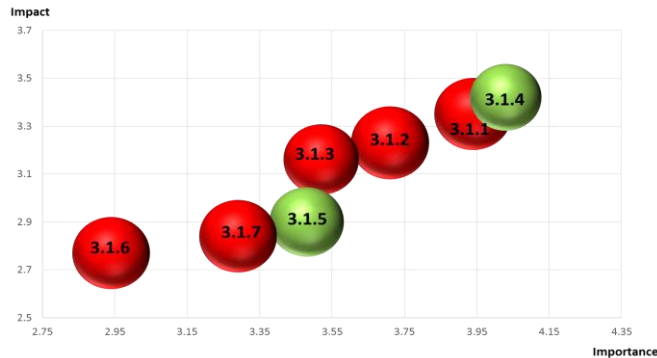


### 5.3.3 Logistics integration

#### 5.3.3.1 Transport Management

##### CHART 5.3.3.1: Standard deviation of responses to Transport Management

KFA 3.1: Chart 1 Standard deviation of responses to Transport Management



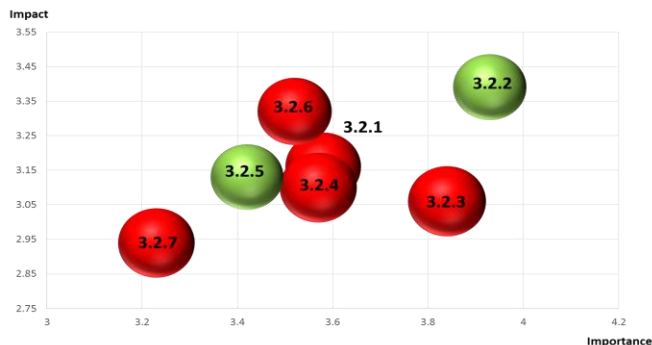
The red bubbles indicate a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position relative to importance and impact. Therefore, SCM elements 3.1.1, 3.1.2, 3.1.3, 3.1.6 and

3.1.7 will be re-evaluated and the results of the second round will be discussed in section 5.4.3.

#### 5.3.3.2 Freight forwarding and clearing

##### CHART 5.3.3.2: Standard deviation of responses to Freight Forwarding and Clearing

KFA 3.2: Chart 1 Standard deviation of responses to Freight Forwarding and Clearing

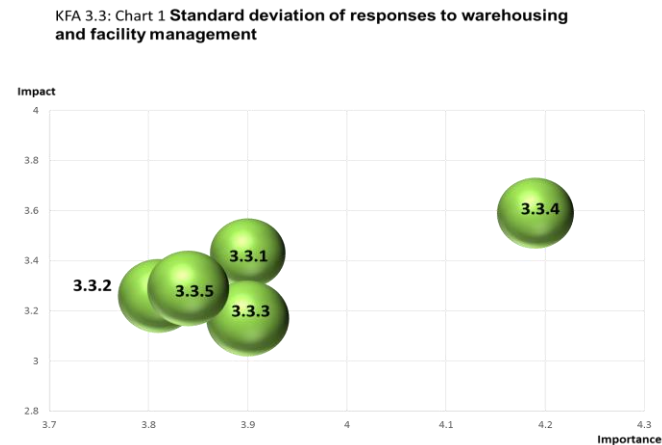


The red bubbles indicate a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position relative to importance and impact. Therefore, SCM elements 3.2.1, 3.2.3, 3.2.4, 3.2.6 and

3.2.7 will be re-evaluated and the results of the second round will be discussed in section 5.4.3.

### 5.3.3.3 Warehousing and facilities management

#### CHART 5.3.3.3: Standard deviation of responses to Warehousing and Facilities

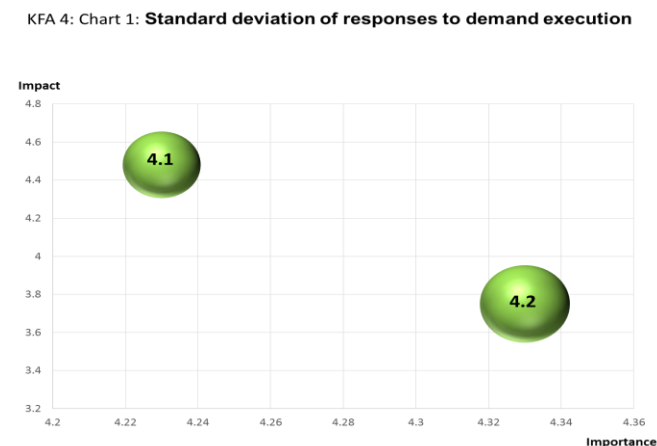


There were no standard deviations of the responses in excess of 1.1 and these five SCM elements will therefore not be subjected to a second round of evaluation as sufficient consensus of its position, relative to importance and impact, was confirmed during

the first review. The positioning of these five SCM elements will be discussed in section 5.4.3.

### 5.3.4 Demand management

#### CHART 5.3.4: Standard deviation of responses to Demand Execution

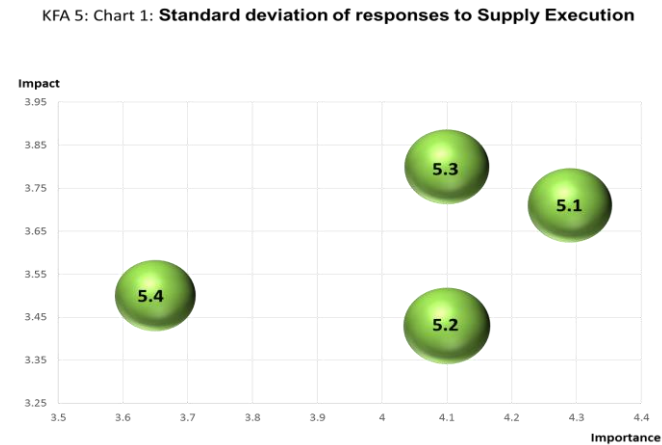


There were no standard deviations of the responses in excess of 1.1 and these two SCM elements will therefore not be subjected to a second round of evaluation as sufficient consensus of its position, relative to importance and impact, was confirmed during

the first review. The positioning of these SCM elements will be discussed in section 5.4.4.

### 5.3.5 Supply execution (Plan to Procure to Pay)

**CHART 5.3.5: Standard deviation of responses to Supply Execution**

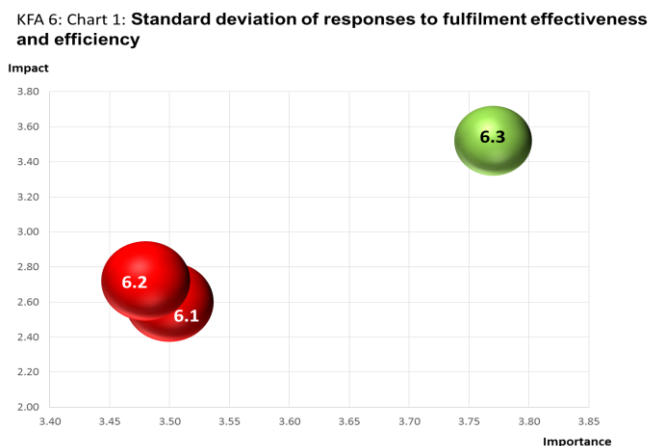


There were no standard deviations of the responses in excess of 1.1 and these four SCM elements will therefore not be subjected to a second round of evaluation as sufficient consensus of its position, relative to importance and

impact, was confirmed during the first review. The positioning of these SCM elements will be discussed in section 5.4.5.

### 5.3.6 Fulfilment

**CHART 5.3.6: Standard deviation of responses to Fulfilment**

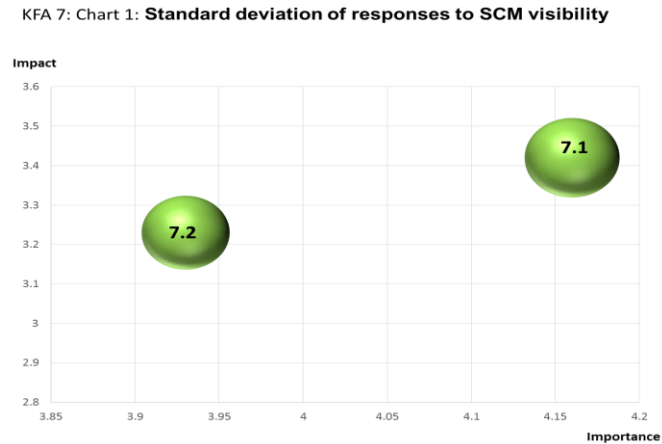


The red bubbles indicate a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position, relative to importance and impact. Therefore, SCM elements 6.1 and 6.2 will be re-evaluated and the results of the

second round will be discussed in section 5.4.6.

### 5.3.7 Supply chain visibility

**CHART 5.3.7: Standard deviation of responses to Supply Chain Visibility**

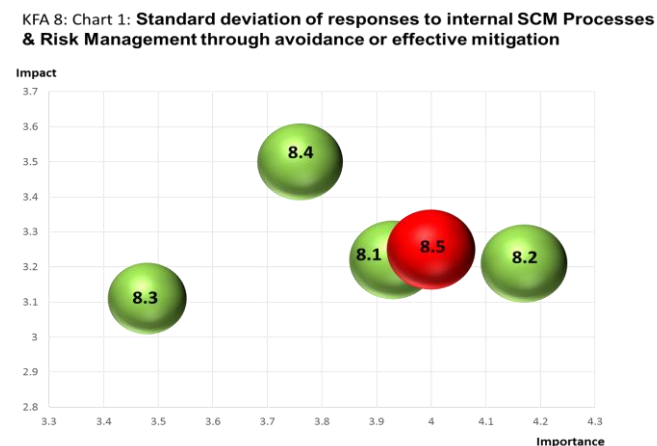


There were no standard deviations of the responses in excess of 1.1 and these two SCM elements will therefore not be subjected to a second round of evaluation as sufficient consensus of its position, relative to importance and impact, was confirmed during

the first review. The positioning of these SCM elements will be discussed in section 5.4.7.

### 5.3.8 Internal process control and risk management

**CHART 5.3.8: Standard deviation of responses to Internal Process Control and Risk Management**



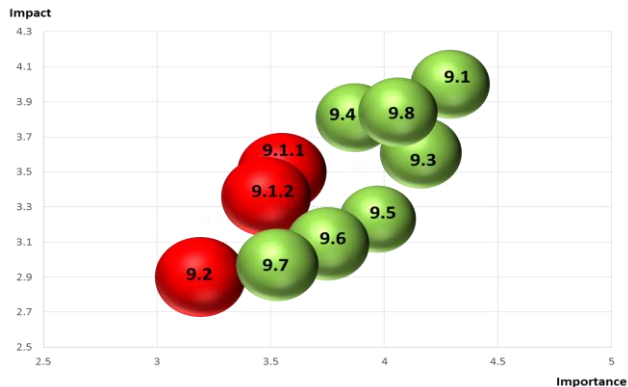
The red bubble indicates a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position, relative to importance and impact.

Therefore, SCM element 8.5 will be re-evaluated and the results of the second round will be discussed in section 5.4.8.

### 5.3.9 Supply chain performance management

#### CHART 5.3.9: Standard deviation of responses to supply chain Performance Management

KFA 9: Chart 1 Standard deviation of responses to SCM Performance Management



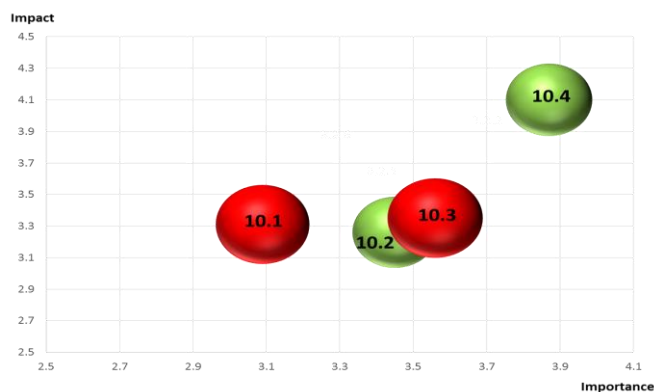
The red bubbles indicate a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position, relative to importance and impact. Therefore, SCM elements 9.1.1, 9.1.2 and 9.2 will be re-

evaluated and the results of the second round will be discussed in section 5.4.9.

### 5.3.10 Sustainable supply chain management

#### CHART 5.3.10: Standard deviation of responses to Sustainable Supply Chain Management

KFA 10: Chart 1 Standard deviation of responses to Sustainable SCM



The red bubbles indicate a standard deviation in excess of 1.1 and will be subjected to a second round of evaluation, seeking sufficient consensus of its position, relative to importance and impact. Therefore, SCM elements 10.1 and 10.3 will be re-evaluated

and the results of the second round will be discussed in section 5.4.10.

#### 5.4 Research results of second round survey

The results of the second round of empirical research and the relative grid position of the humanitarian supply chain management elements pertaining to their relative importance on superior execution and impact on enhanced donor confidence will be discussed in the following paragraphs. Secondly, the SCM elements that still had a high standard deviation after a second round of evaluation will be also be discussed. A high standard deviation is indicative of significant differences in rating between the various respondents.

In chapter four ***relative importance*** has been defined as; “*what is the **relative importance** of this SCM element on superior execution of humanitarian programming?*” ***Impact*** has been defined as; “*what could the impact of this SCM element be on enhanced donor confidence?*” Elements that were rated high or medium on either importance and/or impact are highlighted in green in the nine grid matrix below (refer table 5.4.1). **Twenty-three (23)** SCM elements were rated high on relative importance, as well as high on impact. **Twenty-eight (28)** SCM elements were rated high on relative importance but medium on impact. These **fifty-one (51)** SCM elements are indicated in the green grid boxes 1 and 3 in table 5.4.1 and will be included in the framework to measure SCM efficacy in humanitarian supply environments.

**Two (2)** SCM elements were rated high on relative importance but low on impact, and a further **nine (9)** were rated as medium on both relative importance and impact. These **eleven (11)** SCM elements are indicated in the orange grid boxes 5 and 6 in table 5.4.1 and could be considered for inclusion in the final framework.

**Two (2)** elements were rated as medium on relative importance and low on impact, and a further **one (1)** element was rated low on both relative importance

and impact. These **three (3)** SCM elements are indicated in the red grid boxes **8** and **9** in table 5.4.1 and could be considered for exclusion from the final framework.

Refer to table 5.4.1 for a nine box grid representation of the **fifty-one (51)** elements that would be included indicated in green boxes, the **eleven (11)** SCM elements that could be included under specific circumstances indicated in orange boxes and the **three (3)** SCM elements that would be excluded indicated in the red boxes.

**Table 5.4.1: Nine grid matrix summary following the second survey**

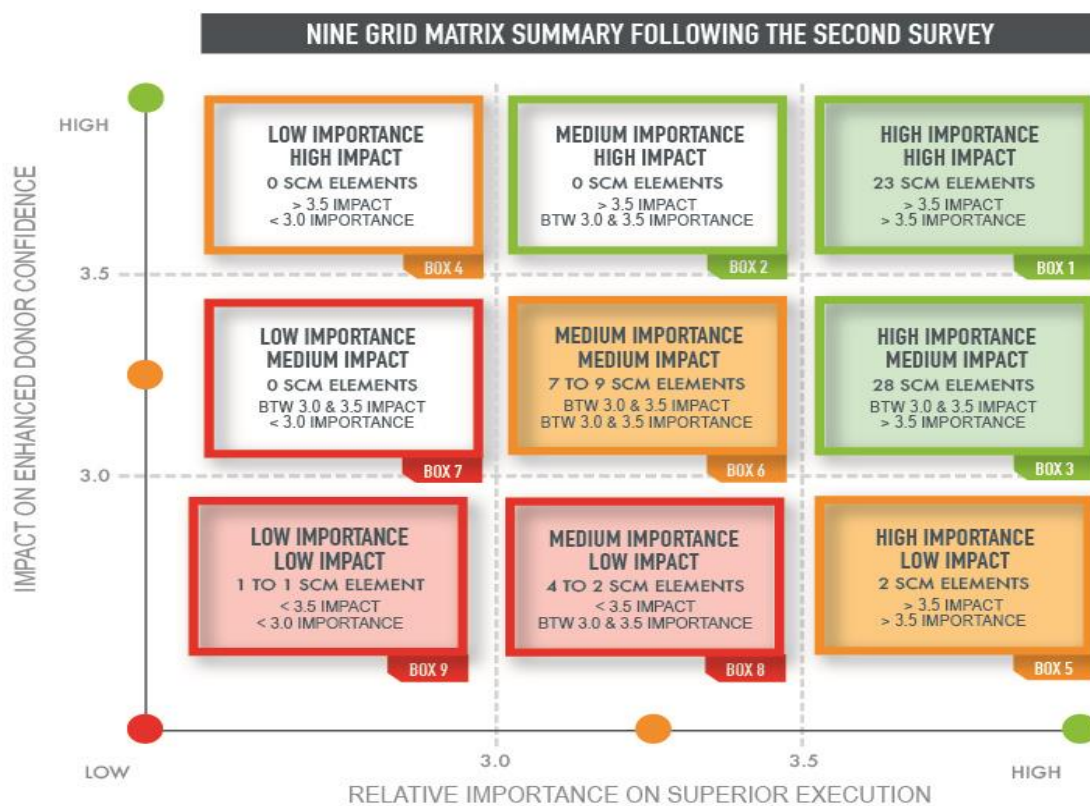
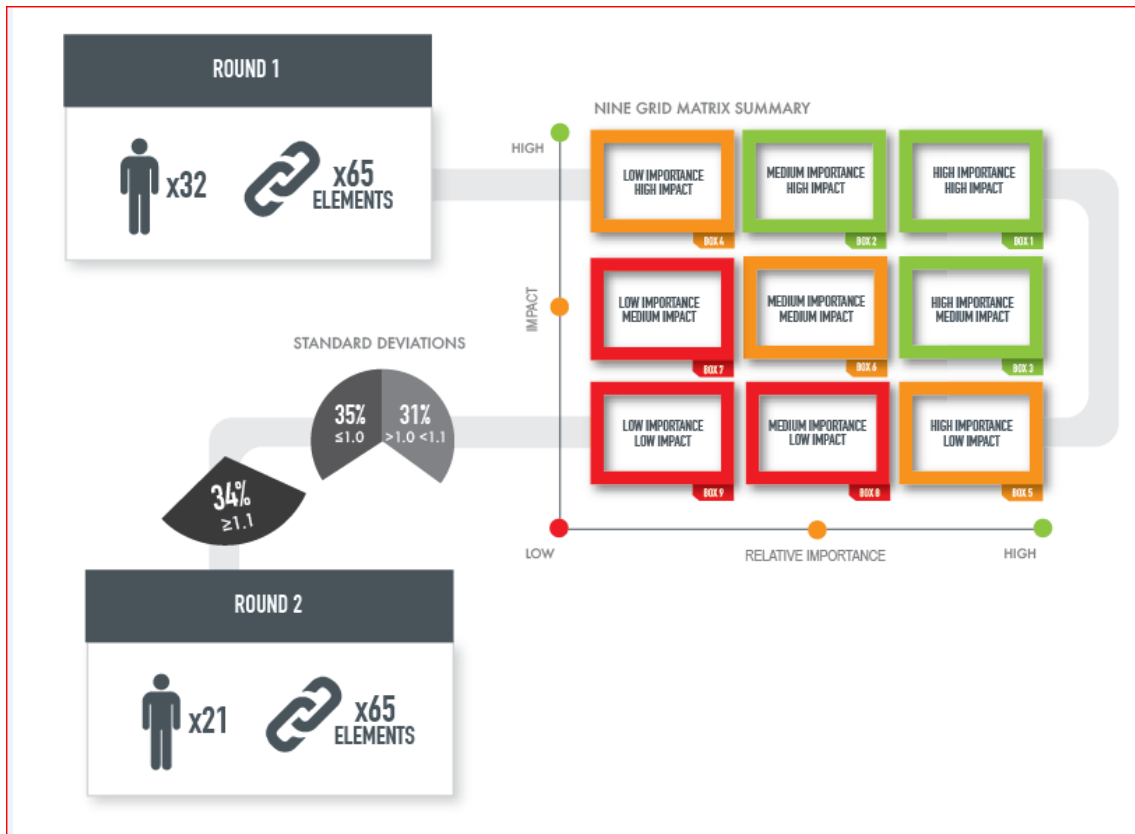


Figure 5.3 depicts the workflow used for evaluating 65 SCM elements for sufficient consensus during round one of the empirical survey. SCM elements

were positioned in a nine grid matrix, but 22 SCM elements had a relatively high standard deviation in excess of 1.1 and were re-evaluated during a second round of empirical research.

**Figure 5.3.3: Process flow that was followed for the data analysis**



Source: Developed by the author for the purposes of this thesis

In the following paragraphs, the results of the second round of empirical research will be analysed. All 65 elements will be discussed by their classification according to their respective grid positions. Tables are used to provide more detailed findings of the data collected. The purpose of the tables are to elaborate on the respective scores of the elements, evaluating the 65 elements for inclusion or exclusion based on their relative grid position of their relative importance and / or impact in the two dimensional grid. Elements that still have standard deviations in excess of 1.1 following the second round will be



identified and if included in the provisional framework, further evaluated for inclusion or exclusion in chapter 6.

#### 5.4.1 SCM elements positioned in grid box 1

Refer to table 5.4.2 for the list of twenty three (23) SCM elements rated ***high on relative importance on superior execution of humanitarian programming*** as well as having a ***high impact on donor confidence and increased funding***.

**Table 5.4.2: List of 23 SCM elements positioned in grid box 1**

NINE GRID MATRIX SUMMARY : BOX 1					
ELEMENT #	ELEMENT KEY WORD	Horizontal axis	Vertical Axis	STD Deviation	STD Deviation
		AVERAGE RATING ON THE RELATIVE IMPORTANCE ON SUPERIOR EXECUTION	AVERAGE RATING ON THE IMPACT ON ENHANCED DONOR CONFIDENCE	STANDARD DEVIATIONS OF SMALLER OR EQUAL TO 1,1	STANDARD DEVIATIONS OF GREATER THAN 1,1
1.1	Ethical standards & policies	4.1	4.8	0.8	
1.2	The SCM strategy formulated & documented	4.3	3.9	0.9	
1.5	Demand fulfilment strategy	4.4	3.8	1.1	
1.6	Procurement Strategy	4.4	3.6	1.1	
1.10	Globalisation	3.7	3.5	0.9	
2.2	Demand Planning	4.0	3.7	1.0	
2.3	Supply Planning	4.3	3.7	1.0	
2.5	Operations Scheduling	4.2	3.8	0.9	
2.6	Financial Appraisal	4.1	4.1	0.9	
3.2.3	Forwarding	4.0	3.5	1.0	
3.2.6	Disbursements	3.9	3.6	0.9	
3.3.4	Incoterms	4.2	3.6	0.9	
4.1	Donor Relationship Management	4.2	4.5	0.7	
4.2	Order Management	4.3	3.8	1.0	
5.1	Purchasing planning	4.3	3.7	1.0	
5.3	Purchasing Execution	4.1	3.8	1.1	
6.3	Execution Management	3.8	3.5	0.9	
9.1	Key performance indicators	4.3	4.0	1.0	
9.3	Contract Management	4.2	3.6	1.0	
9.4	Cost Management	3.9	3.8	1.0	
9.8	Risk and Compliance Management	4.1	3.8	1.0	
10.3	Supplier development programs are implemented	3.7	3.5	1.0	
10.4	Corporate and social responsibility programs are implemented	3.9	4.1	1.0	

As can be seen in table 5.4.2, all 23 elements were rated above 3.5 on a Likert scale of 1 to 5 on both the 'X' (Relative importance) and 'Y' (Impact) axes. The standard deviation of all 23 elements were lower or equal to 1.1 indicating sufficient consensus between the respondents following the second round of empirical research.

#### 5.4.2 SCM elements positioned in grid box 3

Refer to table 5.4.3 for the list of twenty eight (28) SCM elements rated ***high on relative importance on superior execution of humanitarian programming***

as well as having a ***medium impact on donor confidence and increased funding.***

**Table 5.4.3: List of 28 SCM elements positioned in grid box 3**

NINE GRID MATRIX SUMMARY : BOX 3					
ELEMENT #	ELEMENT KEY WORD	Horizontal axis	Vertical Axis	STD Deviation	STD Deviation
		AVERAGE RATING ON THE RELATIVE IMPORTANCE ON SUPERIOR EXECUTION	AVERAGE RATING ON THE IMPACT ON ENHANCED DONOR CONFIDENCE	STANDARD DEVIATIONS OF SMALLER OR EQUAL TO 1,1	STANDARD DEVIATIONS OF GREATER THAN 1,1
1.3	Channel differentiation	3.7	3.4	1.0	1.2
1.4	Demand Management Strategy	4.0	3.2	0.7	
1.9	Product Portfolio Rationalisation	3.7	3.3	1.1	
2.1	Demand / Need Sensing	3.7	3.4	0.9	
2.4	Demand / Supply Balancing (S&OP)	3.5	3.1		
3.1.1	Global Supply Chain Integration	3.9	3.3	1.0	1.2
3.1.2	Developing global logistics strategies	3.6	3.1	1.0	
3.1.3	Multi-Modal Solutions	3.6	3.1	0.9	
3.1.4	Transport Operational Management	4.0	3.4	1.0	
3.1.7	Fleet Management	3.7	3.2		
3.2.1	International Trade	3.6	3.1	1.0	
3.2.2	Clearing	3.9	3.4	1.1	
3.2.7	Foreign Currency & Foreign Exchange management	3.5	3.2	1.0	
3.3.1	Facility location	3.9	3.4	0.8	
3.3.2	Facility Design & Layout	3.8	3.3	0.9	
3.3.3	Facilities Operational Management	3.9	3.2	1.0	
3.3.5	Materials Handling	3.8	3.3	1.0	
5.2	Requisition process	4.1	3.4	1.1	
5.4	Accounts payable process	3.7	3.5	1.0	
7.1	Systems & Technology Implementation	4.2	3.4	1.1	
7.2	Systems & Technology Risks	3.9	3.2	1.0	
8.1	Demand stability vs. volatility	3.9	3.2	1.1	
8.2	Supplier performance and reliability	4.2	3.2	1.1	
8.4	Labour climate in the country and origin	3.8	3.5	1.1	
8.5	Long Shipping line vs. sourcing locally	3.9	3.4	0.9	
9.1.1	High level key performance indicators	3.6	3.5	1.0	
9.5	Process Optimisation	4.0	3.2	0.9	
9.6	Improvement concepts	3.8	3.1	1.1	

As can be seen in table 5.4.3, all 28 elements were rated above 3.5 on a Likert scale of 1 to 5 on the 'X' (Relative importance) axis but between 3.0 and 3.5 on the 'Y' (Impact) axis. The standard deviation of 26 of the 28 elements were lower or equal to 1.1 indicating sufficient consensus between the respondents. However, two elements namely 2.4 and 3.1.7 had a significant difference in rating between the respondents with standard deviations in excess of 1.1. These two elements will be evaluated in chapter 6 taking due cognisance of the qualitative feedback received from the respondents as well as the interpretation of the researcher, following which a decision will be justified whether to include or exclude these two SCM elements from the framework.

### 5.4.3 List of SCM elements positioned in grid box 5

Refer to table 5.4.4 for the list of two (2) SCM elements rated *high on relative importance on superior execution of humanitarian programming* as well as having a *low impact on donor confidence and increased funding*.

**Table 5.4.4: List of 2 SCM elements positioned in grid box 5**

NINE GRID MATRIX SUMMARY : BOX 5					
ELEMENT #	ELEMENT KEY WORD	Horizontal axis	Vertical Axis	STD Deviation	STD Deviation
		AVERAGE RATING ON THE RELATIVE IMPORTANCE ON SUPERIOR EXECUTION	AVERAGE RATING ON THE IMPACT ON ENHANCED DONOR CONFIDENCE	STANDARD DEVIATIONS OF SMALLER OR EQUAL TO 1,1	STANDARD DEVIATIONS OF GREATER THAN 1,1
6.1	Align supplier's manufacturing strategy	3.7	2.5	1.0	1.3
9.7	Change Management	3.5	3.0		

As can be seen in table 5.4.4, both elements were rated above 3.5 on a Likert scale of 1 to 5 on the 'X' (Relative importance) axis but 3.0 or below on the 'Y' (Impact) axis. The standard deviation of one of the element 6.1 was higher than 1.1 indicating a significant difference in rating between the respondents. This element will be evaluated in chapter 6 taking due cognisance of the qualitative feedback received from the respondents as well as the interpretation of the researcher, following which a decision will be justified whether to include or exclude these two SCM elements from the framework.

### 5.4.4 SCM elements positioned in grid box 6

Refer to table 5.4.5 for the list of nine (9) SCM elements rated *medium on relative importance on superior execution of humanitarian programming* as well as having a *medium impact on donor confidence and increased funding*.

**Table 5.4.5: List of 9 elements positioned in grid box 6**

NINE GRID MATRIX SUMMARY : BOX 6					
ELEMENT #	ELEMENT KEY WORD	Horizontal axis	Vertical Axis	STD Deviation	STD Deviation
		AVERAGE RATING ON THE RELATIVE IMPORTANCE ON SUPERIOR EXECUTION	AVERAGE RATING ON THE IMPACT ON ENHANCED DONOR CONFIDENCE	STANDARD DEVIATIONS OF SMALLER OR EQUAL TO 1,1	STANDARD DEVIATIONS OF GREATER THAN 1,1
1.7	Product Development	3.3	3.1	1.1	
1.8	Portfolio Management of service offerings	3.5	3.1	0.9	
3.2.4	Incoterms	3.3	3.0	1.1	
3.2.5	Invoicing and Terms	3.4	3.1	1.1	
8.3	Economic climate of supply market	3.5	3.1	0.9	
9.1.2	Balance Scorecard	3.5	3.5	1.1	
9.2	Level of outsourcing	3.5	3.1		1.2
10.1	Green SCM & triple bottom line accounting	3.0	3.3		1.2
10.2	Supply chain sustainability is ensured	3.5	3.3	1.0	

As can be seen in table 5.4.5, all nine elements were rated between 3.0 and 3.5 on a Likert scale of 1 to 5 on the 'X' (Relative importance) axis as well as between 3.0 and 3.5 on the 'Y' (Impact) axis. The standard deviation of two of the elements (elements 9.2 and 10.1) were higher than 1.1 indicating a significant difference in rating between the respondents. These elements will be evaluated in chapter 6 taking due cognisance of the qualitative feedback received from the respondents as well as the interpretation of the researcher, following which a decision will be justified whether to include or exclude these two SCM elements from the framework.

#### 5.4.5 SCM elements positioned in grid box 8

Refer to table 5.4.6 for the list of two (2) SCM elements rated *medium on relative importance on superior execution of humanitarian programming* as well as having a *low impact on donor confidence and increased funding*.

**Table 5.4.6: List of 2 elements positioned in grid box 8**

NINE GRID MATRIX SUMMARY : BOX 8					
ELEMENT #	ELEMENT KEY WORD	Horizontal axis	Vertical Axis	STD Deviation	STD Deviation
		AVERAGE RATING ON THE RELATIVE IMPORTANCE ON SUPERIOR EXECUTION	AVERAGE RATING ON THE IMPACT ON ENHANCED DONOR CONFIDENCE	STANDARD DEVIATIONS OF SMALLER OR EQUAL TO 1,1	STANDARD DEVIATIONS OF GREATER THAN 1,1
3.1.5	Managing Transport Risk	3.5	2.9	1.1	
6.2	Consignment design	3.2	2.5	1.1	

As can be seen in table 5.4.6, both elements were rated between 3.0 and 3.5 on a Likert scale of 1 to 5 on the 'X' (Relative importance) axis but below 3.0 on the 'Y' (Impact) axis. The standard deviation of both elements were 1.1 indicating sufficient consensus in rating between the respondents agreeing on the insignificance on relative importance and impact of these two SCM elements.

**These two elements will henceforth be excluded from the framework.**

#### 5.4.6 SCM elements positioned in grid box 9

Refer to table 5.4.7 for the one (1) SCM element rated *low on relative importance on superior execution of humanitarian programming* as well as having a *low impact on donor confidence and increased funding*.

**Table 5.4.7: List of the 1 element positioned in grid box 9**

NINE GRID MATRIX SUMMARY : BOX 9					
ELEMENT #	ELEMENT KEY WORD	Horizontal axis	Vertical Axis	STD Deviation	STD Deviation
		AVERAGE RATING ON THE RELATIVE IMPORTANCE ON SUPERIOR EXECUTION	AVERAGE RATING ON THE IMPACT ON ENHANCED DONOR CONFIDENCE	STANDARD DEVIATIONS OF SMALLER OR EQUAL TO 1,1	STANDARD DEVIATIONS OF GREATER THAN 1,1
3.1.6	Reverse Logistics	2.8	2.4		1.2

As can be seen in table 5.4.7, the element was rated below 3.0 on a Likert scale of 1 to 5 on the 'X' (Relative importance) axis as well as below 3.0 on the 'Y' (Impact) axis. The standard deviation was above 1.1 indicating a difference of opinion in rating between the respondents. **However, due to the insignificance on relative importance and impact, this element will henceforth be excluded from the framework.**

## 5.5 Summary

Through empirical research augmented by the Delphi technique, ten key focus areas were validated and several SCM elements were confirmed in a set of elements that decision-makers and leaders in the humanitarian supply sector

need to take into consideration when determining how to measure their supply chain's efficacy.

The study investigated the significance and validity of whether all **65 supply chain management elements** that were subjected to empirical evaluation need to be included in the framework to measure supply chain management efficacy. Following the first empirical survey, **22 of the 65** elements had a standard deviation in excess of 1.1 indicating significant disagreement between the respondents. None of the elements were eliminated but these **22** elements were subjected to a second survey.

Following the second empirical survey, **two (2)** SCM elements were rated high on relative importance but low on impact, and a further **nine (9)** were rated as medium on both relative importance and impact. These **eleven (11)** SCM elements are indicated in the orange grid boxes 5 and 6 in table 5.4.1 and could be considered for inclusion in the final framework. The conditions under which these eleven (11) elements could be considered for inclusion will be evaluated in chapter 6.

*Five (5) SCM elements were rated as relevant for inclusion in the framework based on their relative grid positions but had standard deviations in excess of 1.1 indicating a concerning difference of opinion between respondents. The conditions and/or circumstances under which these elements could be considered for inclusion will be further analysed in chapter 6. See figure 5.3.3 for the process steps that were used during the various phases of data analysis.*

**Three (3) of 65** elements were excluded from the framework following the second survey based on their relative low position on the nine grid matrix (Table 5.4.1) of relative importance vs. impact. These three elements are:

1. **Element 3.1.5 - Managing Transport Risk.** (Managing all risks related to international transport of products, this includes aspects such HAZCHEM.)
2. **Element 3.1.6 - Reverse Logistics.** (Managing product and packaging returns through a reverse logistics processes)
3. **Element 6.2 - Consignment design.** (Consignment and packaging design aligning specifications with receiving facility capacity, capability and limitations.)

## CHAPTER 6: RESEARCH RESULTS

This chapter summarises the research findings of the data collected during all rounds of research as well as the interpretation of the analyses. Furthermore, the data analyses will be interpreted in the light of the comments and arguments received from the various expert opinion respondents. All of the SCM elements will be discussed by key focus area in section 6.3. The conditions for inclusion of the eleven (11) elements that were rated in the orange grid boxes (Table 5.4.1), as well as the five (5) elements that had standard deviations in excess of 1.1 following the second survey, will be evaluated for inclusion in the framework in section 6.3.

### 6.1 Introduction

**Three (3) of the sixty-five (65)** elements were excluded from the framework following the second survey based their relative low position on the nine grid matrix of importance vs. impact.

**Eleven (11) of the remaining sixty-two (62)** SCM elements were rated as orange in Table 5.4.1, indicating medium importance and / or impact. These eleven (11) SCM elements will be re-evaluated and considered for inclusion into the framework, based on the comments and feedback received from the subject matter experts. These eleven SCM elements are:

1. Element 1.7 - Product development strategy
2. Element 1.8 - Portfolio management of service offerings
3. Element 3.2.4 - Incoterms
4. Element 3.2.5 - Invoicing and Terms
5. Element 6.1 - Align supplier's manufacturing strategy with own desired logistics concept.
6. Element 8.3 - Economic climate of supply market
7. Element 9.1.2 - Balanced Scorecard



8. Element 9.2 - Level of outsourcing and collaborative alliances
9. Element 9.7 - Change Management
10. Element 10.1 - Green supply chain management and triple bottom line accounting.
11. Element 10.2 - Supply chain sustainability is ensured

**Five (5) of the remaining sixty-two (62)** elements had relatively high standard deviations following the second survey. The relative low level of consensus pertaining to these five elements could be due to disagreement but it could also be due to misinterpretation and/or misunderstanding between the respondent. These five (5) elements will be re-evaluated and considered for inclusion, based on the comments and feedback received from the subject matter experts. These five SCM elements are:

1. Element 2.4 - Demand / Supply Balancing
2. Element 3.1.7 - Fleet Management
3. Element 6.1 - Align supplier's manufacturing strategy with own desired logistics concept.
4. Element 9.2 - Level of outsourcing and collaborative alliances
5. Element 10.1 – Green supply chain management and triple bottom line accounting.

As can be seen from the two lists above, three (3) SCM elements are common in the sense they were rated as orange (medium importance and/or impact) as well as low levels of consensus between the respondents. The three common SCM elements are:

1. Element 6.1 - Align supplier's manufacturing strategy with own desired logistics concept.
2. Element 9.2 - Level of outsourcing and collaborative alliances
3. Element 10.1 – Green supply chain management and triple bottom line accounting.

The evaluation and interpretation of the comments and observations from the respondents may be viewed as a third round of qualitative Delphi technique consensus facilitation, albeit interpretivist and functionalist in nature.

## **6.2 Dissecting the research results into a framework**

The purpose of the research questionnaire as articulated in chapter 4 was to empirically evaluate which SCM elements ought to be included into a framework (what) for Supply Chain Managers (whom) to measure Supply Chain Management efficacy in humanitarian supply environments. This research aims to identify a comprehensive hierarchy of SCM elements that pertains to humanitarian supply environments. The research questionnaire aimed to arrange these supply chain management elements that would differentiate between those elements that:

- a) are most important pertaining to superior execution of humanitarian programming;
- b) could have the most significant impact on enhanced donor confidence and increased funding;
- c) have most significant impact on risk mitigation;
- d) evaluates whether the supply chain management metric would indicate effectiveness or efficiency;
- e) would indicate whether the supply chain management function in the humanitarian organisation can directly control or indirectly influence efficacy of a specific element, and
- f) whether the metrics would be a lead or a lag indicator.


Figure 6.1 illustrates how the responses to questions 'a' to 'f' will be interpreted and incorporated into a framework. The next paragraphs all refer to figure 6.1.

One can see that **question ‘a’** namely “*what is the relative importance of this SCM element on superior execution of humanitarian programming?*” and

**question ‘b’** namely “*what could the impact of this SCM element be on enhanced donor confidence?*” was addresses in the nine grid matrix summary discussed in detail in chapter 5. More details will be given in section 6.2.1.

**Figure 6.1: Framework for the interpretation of the research results**

### PROCESSING OF QUESTIONS ‘a’ to ‘f’

Question Number	Summary of question description	Conclusion
a	Importance of this SCM element on superior execution of humanitarian programming	Culled the SCM elements which were rated non important or having low impact on donor confidence
b	Impact of this SCM element on enhanced donor confidence	Culled the SCM elements which were rated non important or having low impact on donor confidence
c	Risk mitigation	1 of 2 focused frameworks on risk aversion vs. value adding 
e	Direct vs Indirect	1 of 3 focused frameworks. Above or below direct control line
f	Lead or Lag	84% lead – 16% lag
d	Effectiveness vs Efficiency	46% effective - 54% efficient

Source: Developed by the author for the purposes of this thesis

**Question ‘c’** pertains to “*the SCM element’s impact risk mitigation*”. These results will be evaluated in a continuum contrasting risk averse SCM organisations where the impact of the SCM element on risk was rated as high

versus value adding SCM organisations where the impact of the SCM element on risk is low. *More details will be discussed in section 6.2.2.*

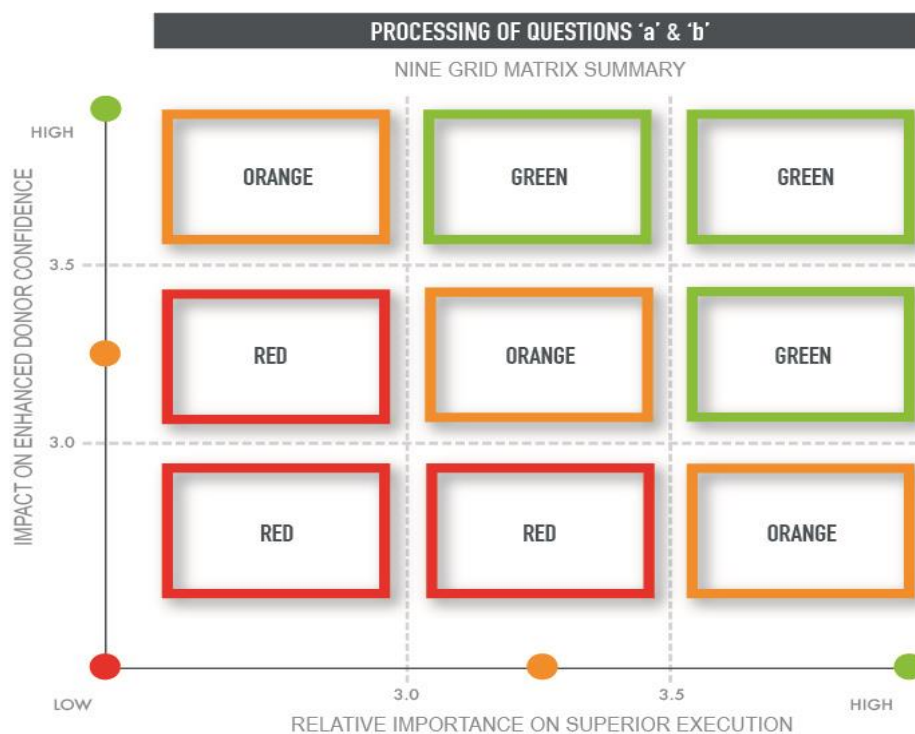
**Question ‘e’** was designed to determine ***“which SCM elements are under the direct control of the Supply Chain Management function”***. Those SCM elements under the direct control of the SCM function will be treated differently from those which are not under the direct control and will be discussed in more detail in section 6.2.3.

**Question ‘f’** was included to establish ***“whether each metric is viewed as either and ‘Lead’ or ‘Lag’ metric”***. The details of these findings will be discussed in section 6.2.4.

**Question ‘d’** had as its purpose to ***“differentiate between SCM elements that would be more focused on measuring supply chain management effectiveness and/or efficiency”***. The research results of the responses to this question will be elaborated upon in section 6.2.5.

### **6.2.1 Importance and impact indicators**

A nine grid matrix summary was used to position the remaining 62 SCM elements following the second round of empirical research in accordance with their relative importance on superior execution and their impact on enhanced donor confidence. Refer figure 6.2 for a diagrammatic presentation of how the responses to questions ‘a’ and ‘b’ were evaluated.

**Figure 6.2: Nine grid matrix summary processing questions 'a' & 'b'**

### 6.2.2 Risk indicators

In the research questionnaire, the respondents were asked to evaluate whether the elements would have a high or low impact on risk mitigation (question 'c'). Humanitarian supply chains are hugely exposed to risk, whether it being physical risks, security risks, forensic risks, audit risks and/or reputational exposure, so the research question was aimed at evaluating a broad spectrum of risks.

Refer table 6.1 for a list of SCM elements that were rated as having a high impact on risk mitigation. **Forty-eight (48) of the remaining sixty-two (62)** SCM elements were rated by the respondents as having the potential of high impact on the supply chain's risk profile.

**Table 6.1: SCM elements that have a high impact on risk mitigation**

<b>SCM ELEMENTS THAT HAVE A HIGH IMPACT ON RISK MITIGATION</b>			
<b>ELEMENT #</b>	<b>ELEMENT KEYWORD</b>	<b>HIGH</b>	<b>LOW</b>
1.1	Ethical standards & policies	✓	
1.2	The SCM strategy formulated & documented	✓	
1.3	Channel differentiation	✓	
1.4	Demand Management Strategy	✓	
1.5	Demand fulfilment strategy	✓	
1.6	Procurement Strategy	✓	
1.9	Product Portfolio Rationalisation	✓	
1.10	Globalisation	✓	
2.2	Demand Planning	✓	
2.3	Supply Planning	✓	
2.4	Demand / Supply Balancing (S&OP)	✓	
2.5	Operations Scheduling	✓	
2.6	Financial Appraisal	✓	
3.1.1	Global Supply Chain Integration	✓	
3.1.2	Developing global logistics strategies	✓	
3.1.3	Multi-Modal Solutions	✓	
3.1.4	Transport Operational Management	✓	
3.2.1	International Trade	✓	
3.2.2	Clearing	✓	
3.2.3	Forwarding	✓	
3.2.4	Incoterms	✓	
3.2.6	Disbursements	✓	
3.2.7	Foreign Currency & Foreign Exchange management	✓	
3.3.1	Facility location	✓	
3.3.2	Facility Design & Layout	✓	
3.3.3	Facilities Operational Management	✓	
3.3.4	Inventory control	✓	
3.3.5	Materials Handling	✓	
4.1	Donor Relationship Management	✓	
4.2	Order Management	✓	
5.1	Purchasing planning	✓	
5.2	Requisition process	✓	
5.3	Purchasing Execution	✓	
5.4	Accounts payable process	✓	
6.3	Execution Management	✓	
7.1	Systems & Technology Implementation	✓	
7.2	Systems & Technology Risks	✓	
8.1	Demand stability vs. volatility	✓	
8.2	Supplier performance and reliability	✓	
8.3	Economic climate of supply market	✓	
8.4	Labour climate in the country and origin	✓	
8.5	Long Shipping line vs. sourcing locally	✓	
9.1	Key performance indicators	✓	
9.1.1	High level key performance indicators	✓	
9.3	Contract Management	✓	
9.4	Cost Management	✓	
9.5	Process Optimisation	✓	
9.8	Risk and Compliance Management	✓	

Hence these elements would be more appropriate for incorporation into a framework for emerging SCM offices whom would be focusing on risk aversion and avoiding of audit findings.

Refer table 6.2 for a list of SCM elements that were rated as having a low impact on risk mitigation. **Fourteen (14) of the remaining sixty-two (62)** SCM elements were rated by the respondents as having the potential of low impact on the supply chain's risk profile. Hence these elements would be more appropriate for incorporation into a framework for more mature SCM offices whom would be beyond focusing on risk aversion and avoiding of audit findings and would rather be viewed as a respected business partner at the "C-Suite" level of an organisation.

**Table 6.2: SCM elements that have a low impact on risk avoidance**

SCM ELEMENTS THAT HAVE A LOW IMPACT ON RISK MITIGATION			
<i>ELEMENT #</i>	<i>ELEMENT KEYWORD</i>	<i>HIGH</i>	<i>LOW</i>
1.7	Product Development		✓
1.8	Portfolio Management of service offerings		✓
2.1	Demand / Need Sensing		✓
3.1.7	Fleet Management		✓
3.2.5	Invoicing and Terms		✓
6.1	Align supplier's manufacturing strategy.		✓
9.1.2	Balance Scorecard		✓
9.2	Level of outsourcing		✓
9.6	Improvement concepts		✓
9.7	Change Management		✓
10.1	Green SCM & triple bottom line accounting		✓
10.2	Supply chain sustainability is ensured		✓
10.3	Supplier development programs are implemented		✓
10.4	Corporate and social responsibility programs are implemented		✓

Refer section 6.3.12 for a discourse on the behaviour of less mature supply chain offices being more risk averse, focusing on avoiding audit findings and more mature supply chain offices focusing on adding value. This discourse will

be incorporating the qualitative feedback from the respondents which will be covered throughout section 6.3 and will determine in which of the three frameworks each element gets incorporated into.

### **6.2.3 Direct control versus influence**

In the research questionnaire, the respondents were asked to evaluate whether the elements would be under the direct control of the SCM function, or whether the SCM function would only have indirect influence through functional alliances and integrated cross-functional metrics.

The majority of the SCM elements namely **Fifty-four (54) of the remaining sixty-two (62)** to be precise rated by the respondents as being under the direct control of SCM functional leadership (refer table 6.3). This is a positive finding in that the SCM function will be less dependent on organisational dynamics and relationship building and will have more control over their results, contingent on the strength of their mandate.

Only **Eight (8) of the remaining sixty-two (62)** elements are not controlled by the line management of a SCM function but can be indirectly influenced by the SCM function (Refer table 6.4)

Those elements under direct control of the SCM function will be included in one of two frameworks and will be further explained in the next paragraphs and detailed in sections 7.3.1 and 7.3.2. Those elements not directly controlled will be covered in section 7.3.3.



**Table 6.3: SCM elements under the direct control of the SCM function**

SCM ELEMENTS UNDER THE DIRECT CONTROL OF THE SCM FUNCTION			
ELEMENT #	ELEMENT KEYWORD	DIRECT	INDIRECT
1.1	Ethical standards & policies	✓	
1.2	The SCM strategy formulated & documented	✓	
1.3	Channel differentiation	✓	
1.4	Demand Management Strategy	✓	
1.5	Demand fulfilment strategy	✓	
1.6	Procurement Strategy	✓	
1.7	Product Development	✓	
1.8	Portfolio Management of service offerings	✓	
1.9	Product Portfolio Rationalisation	✓	
1.10	Globalisation	✓	
2.1	Demand / Need Sensing	✓	
2.2	Demand Planning	✓	
2.3	Supply Planning	✓	
2.4	Demand / Supply Balancing (S&OP)	✓	
2.5	Operations Scheduling	✓	
3.1.1	Global Supply Chain Integration	✓	
3.1.2	Developing global logistics strategies	✓	
3.1.3	Multi-Modal Solutions	✓	
3.1.4	Transport Operational Management	✓	
3.1.7	Fleet Management	✓	
3.2.2	Clearing	✓	
3.2.3	Forwarding	✓	
3.2.4	Incoterms	✓	
3.2.6	Disbursements	✓	
3.3.1	Facility location	✓	
3.3.2	Facility Design & Layout	✓	
3.3.3	Facilities Operational Management	✓	
3.3.4	Inventory control	✓	
3.3.5	Materials Handling	✓	
4.1	Donor Relationship Management	✓	
4.2	Order Management	✓	
5.1	Purchasing planning	✓	
5.2	Requisition process	✓	
5.3	Purchasing Execution	✓	
5.4	Accounts payable process	✓	
6.1	Align supplier's manufacturing strategy.	✓	
6.3	Execution Management	✓	
7.1	Systems & Technology Implementation	✓	
7.2	Systems & Technology Risks	✓	
8.1	Demand stability vs. volatility	✓	
8.2	Supplier performance and reliability	✓	
8.3	Economic climate of supply market	✓	
8.5	Long Shipping line vs. sourcing locally	✓	
9.1	Key performance indicators	✓	
9.1.1	High level key performance indicators	✓	
9.1.2	Balance Scorecard	✓	
9.2	Level of outsourcing	✓	
9.3	Contract Management	✓	
9.4	Cost Management	✓	
9.5	Process Optimisation	✓	
9.6	Improvement concepts	✓	
9.7	Change Management	✓	
9.8	Risk and Compliance Management	✓	
10.3	Supplier development programs are implemented	✓	

**Table 6.4: SCM elements not under the direct control of the SCM function**

SCM ELEMENTS NOT UNDER THE DIRECT CONTROL OF THE SCM FUNCTION			
ELEMENT #	ELEMENT KEYWORD	DIRECT	INDIRECT
2.6	Financial Appraisal		✓
3.2.1	International Trade		✓
3.2.5	Invoicing and Terms		✓
3.2.7	Foreign Currency & Foreign Exchange management		✓
8.4	Labour climate in the country and origin		✓
10.1	Green SCM & triple bottom line accounting		✓
10.2	Supply chain sustainability is ensured		✓
10.4	Corporate and social responsibility programs are implemented		✓

#### 6.2.4 Lead versus Lag indicators

In the research questionnaire, a lead indicator was described as informing the future state or future outcomes, in other words, what can be expected to happen to the results in future if a lead indicator indicates a positive or negative tendency. The example of a lead indicator that was provided in the questionnaire was "*measuring suggestions and innovations per person*". A positive trend of suggestions per person would be seen as a lead indicator of "*high staff morale*".

A lag Indicator is based on data or information that happened in the past. The example of a lag indicator that was provided in the questionnaire was "*measuring high absenteeism or people arriving late at work*". A negative trend of such an indicator could be a lag indicator of "*low staff morale*".

Another example would be whether high ethical standards could avoid corruption (lead indicator if one could measure conformance to high ethical standards), or would one use good ethical standards as a policy to fall back on for disciplinary action when corruption happened (lag indicator).

Of the **62 elements** that will be included following the 2<sup>nd</sup> survey, **52 elements** were rated as being lead indicators and **10** were rated as lag indicators. A

dominant trend emerged indicating that most of the elements proposed would be lead indicators. Managing these SCM elements appropriately should have a positive influence the overall performance of the humanitarian supply chain. **Priority will be given to include lead indicators in the framework.**

### 6.2.5 Effectiveness versus efficiency indicators

Oxford Dictionary and Thesaurus (2001) defines efficacy as “***the ability to produce the intended result***”.

Another definition of efficacy is “***The power or capacity to successfully produce a desired effect or intended result.***”

<http://www.thefreedictionary.com/efficacy>

Effectiveness is “***the extent to which an activity fulfils its intended purpose or function.***”

<http://www.qualityresearchinternational.com/glossary/effectiveness.htm>

Efficiency is “***the extent to which an activity achieves its goal whilst minimising resource usage.***”

<http://www.qualityresearchinternational.com/glossary/effectiveness.htm>

In the research questionnaire, effectiveness was explained as the extent to which an activity fulfils its intended purpose or function. (In short: Doing the right things). Efficiency was explained as the amount of resource or capacity needed to successfully produce the desired effect or intended result. (In short: Doing the things right).

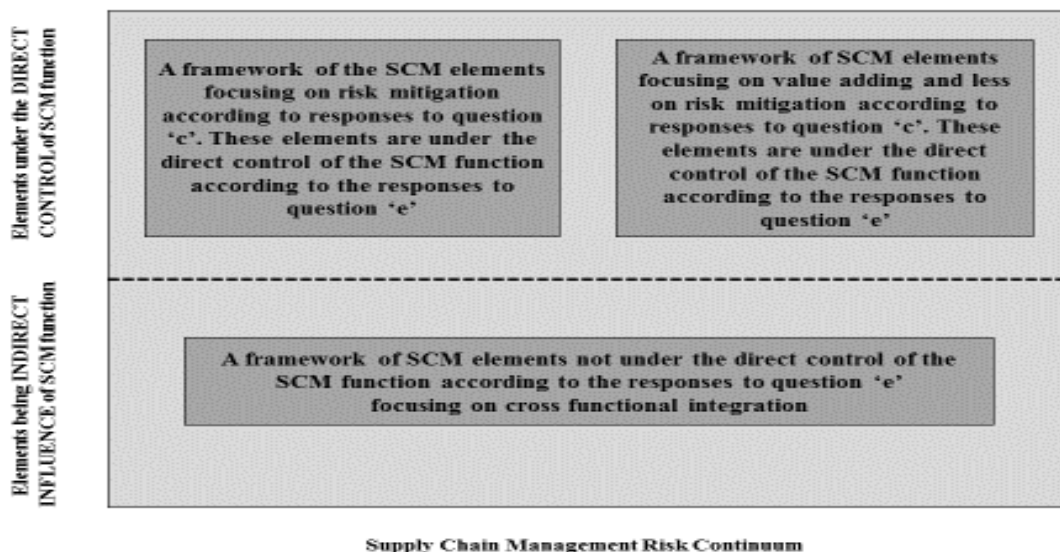
Of the **62 elements** were included following the 2<sup>nd</sup> survey, **27** were rated as making a more significant contribution to supply chain management effectiveness and **32** were rated as influencing efficiency, and **three (3)**

contributed to both effectiveness and efficiency. Although no dominant trend emerged between effectiveness and efficiency, it can be postulated that effectiveness should be a higher priority than efficiency. The justification being that one does not want to do anything costs effectively if it should not have been done at all. **Therefore, elements measuring effectiveness will be rated as a higher priority in the framework.**

### 6.2.6 Arranging the presentation of the research findings

Questions 'a' and 'b' were used to determine whether a SCM element would be included into the framework or not. Question 'c' was used to determine the impact of the SCM element on risk mitigation and question 'e' was used to determine whether the SCM function had direct control or only cross functional influence. The results of responses to questions 'c' and 'e' will be presented in a matrix of three sub frameworks as illustrated in figure 6.3.

**Figure 6.3: Framework for the interpretation questions 'c' and 'e'**



### 6.3 Research findings

In the following paragraphs, each of the 62 elements that were retained following the second round of empirical research will be discussed individually. The empirical findings of each element's relevance with respect to its risk profile, being under direct vs. indirect control of the supply chain management function, lead vs. lag propensity and effectiveness vs. efficiency correlation will be evaluated. The selection of which framework each element will be allocated to will be influenced by the comments from the various respondents as well as the ratings following the empirical research.

#### 6.3.1 Supply chain management strategy

Table 6.3.1 summarises the list of elements included under the key focus area of *supply chain management strategy*. The ten elements will be discussed individually.

**Table 6.3.1: Elements included on the KFA of *supply chain strategy***

SUMMARY OF RESEARCH FINDINGS OF THE SUPPLY CHAIN MANAGEMENT STRATEGY KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
1.1	Ethical standards & policies	0.8	2	2	1	1
1.2	The SCM strategy formulated & documented	0.9	2	2	1	1
1.3	Channel differentiation	1.0	2	2	1	1
1.4	Demand Management Strategy	0.7	2	2	1	2
1.5	Demand fulfilment strategy	1.1	2	2	1	2
1.6	Procurement Strategy	1.1	2	2	1	1
1.7	Product Development	1.1	1	2	1	1
1.8	Portfolio Management of service offerings	0.9	1	2	1	2
1.9	Product Portfolio Rationalisation	1.1	2	2	1	2
1.10	Globalisation	0.9	2	2	1	2

#### Element 1.1 – Ethical standards and policies

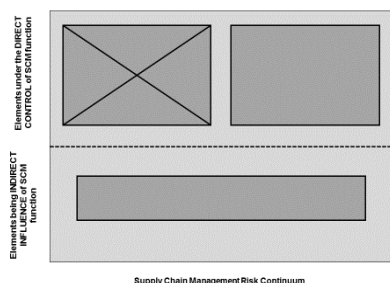
'Ethical standards' and 'Conflict of Interest' policies are defined and staff are re-committing annually in writing to uphold these.

Qualitative feedback received from respondents by way of their comments were as follows:

- I doubt whether this is necessary for SCM only but rather for everything? What is the value of a signature?
- International Trade Manager working in the for-profit sector serving humanitarian supply environments commented: "as part of the annual re-commitment, staff should be taken through an annual refresher course and be tested (online tests) on their understanding of 'Ethical standards' and 'conflict of interest' to ensure they are familiar with what is required. All new staff recruited within the year should also go through the course and test as part of their induction."
- "Continuous" improvement is impossible. Reviews and lengthy discussion is usually required to achieve incremental change (improvement). More a question of intent and focus over time (perhaps years). But "improvement" is always on the agenda! Never be satisfied. SCM can ALWAYS be done better! The policies must be up front and committed too but in the end they are pieces of paper. It is the human heart, the corporate culture that determines the outcome.
- Long term crucial.
- 3rd world does not care about ethics, but will help with donor confidence, but will not make a difference at execution level.
- Ethical & Standards are like the backbone of SCM they help define boundaries of which one needs to operate and work.
- The humanitarian industry needs a high emphasis on ethics because the countries where such work is happening have high risks for fraud, corruption and misappropriation.

The standard deviation in responses were 0.77 indicating reasonable consensus between respondents. The grid position in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing

supply chain organisations focusing on risk mitigation.

### **Element 1.2 – SCM strategy formulated and documented**

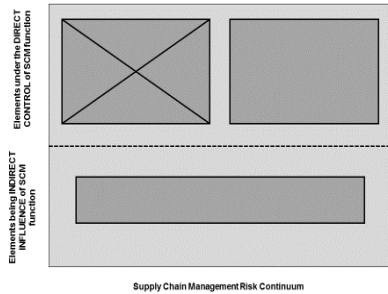
Differentiating supply chain strategies such as a responsive supply chain for agile responses following rapid onset disasters vs. lean supply chains commensurate with slow onset programming needs.

Qualitative feedback received from respondents by way of their comments were as follows:

- Complex, but important.
- It could be viewed more negative if not satisfactory as more positive if excellent.
- For programming.
- A clear Strategy will definitely aid in the course of action and time is of essence here the more reason having strategies is place of importance to support in the best course of action.
- SCM strategy is important but an organization can run smoothly without one, until they grow very large and have differentiated services or channels.
- The strategy will indicate SCM objectives (effectiveness) and the levers, or approaches to achieve them (efficiency).
- Depends on knowledge and requirements donor and what output they are looking for.

The standard deviation in responses were 0.93 indicating reasonable consensus between respondents. The grid position in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 1.3 – Channel differentiation

Different channels have different operating requirements. Various channel strategies exist and are implemented.

Qualitative feedback received from respondents by way of their comments were as follows:

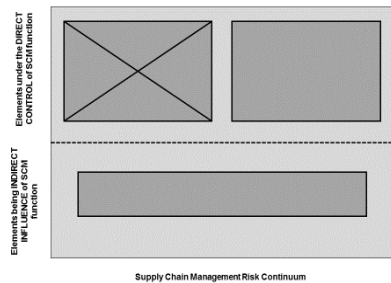
- Necessary for efficiency and appropriate service delivery. Flexibility in approach is required if differing challenges are to be managed.
- International Trade Manager working in the for-profit sector serving humanitarian supply environments commented: “Appropriate strategies by channel would impact both effectiveness AND efficiency”.
- Needs to monitor and switch between channels as required.
- Differentiation is important, but the combination of slow vs fast is also important, so the differentiation lies in the "need". The bigger the Org, the slower the response.
- The strategy is important, but is more important to have an execution plan that works. Proof of concept is the key here.
- Especially important for food, medicines and construction. The Lead vs. Lag question is confusing here.

The standard deviation in responses were 1.01 indicating reasonable consensus between respondents. The grid position in box 3 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and



- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

#### **Element 1.4 – Demand management strategy**

The strategy of selecting service levels by supply channel.

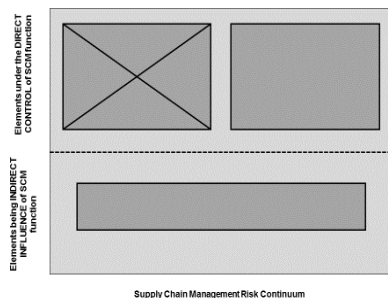
Qualitative feedback received from respondents by way of their comments were as follows:

- International Trade Manager working in the for-profit sector serving humanitarian supply environments commented: “An effective Demand management strategy would help obviate out of stock situations/crisis /high costs of supply to meet emergency demand- this is critical to superior execution, and also determine efficiency”.
- Complex but necessary to do
- This helps in balancing the requirements of all the stakeholders be it customers and the capabilities of the supply chain
- Specifically important to differentiate the service levels between emergency life and death vs. longer term work in poverty development for example.
- Same argument like strategy
- Especially for long term projects
- A number of points have come out low on impact due to the column on impact on donor funding. Where I have rated them low it is because I have never experienced a donor showing interest in the strategy mentioned, not because I personally don't think it would bring benefit.
- Up to 60% of humanitarian action is Government funded. i.e. USAID, DFID, EU etc. The Governments give what their legislatures approve based on advocacy and political mileage. The agencies work hard to ensure level of SCM to meet the grant conditions & some beneficiary requirements within the fiscal year to ensure chances of repeat funding.

- In my opinion this element has lot of strategic importance for Humanitarian Supply Chain and required attention and I feel that from this research paper this can be highlighted.
- Based on my practical experience I noticed that both Save and World Vision have put Globally Long term agreement in order to get the volume discounts, decline the quantity of transactions between suppliers, reduce the level effort on recurrent ad-hoc purchasing process and all of these are very relevant and have a huge impact to get donor trust, confidence and improve delivery to beneficiaries.

The standard deviation in responses reduced to 0.71 during the second survey indicating reasonable consensus between respondents. The grid position in box 3 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 1.5 – Demand fulfilment strategy**

Designing the supply chain to best serve the selected segments and locations. This includes the network design, supply locations, market locations, physical distribution infrastructure, and cost analyses.

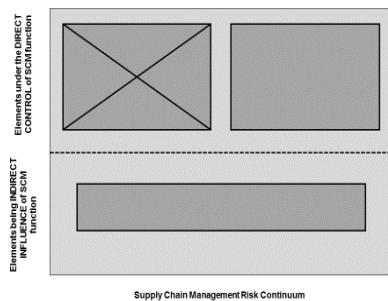
Qualitative feedback received from respondents by way of their comments were as follows:

- More internally driven as required by the donor.

- Needs to be sold and demonstrated to donors.
- Once this is properly defined it helps better bench mark vendors to provide you with proper pricing, better leveraging the prices.
- The vast majority of humanitarian demand is done by its suppliers so this is of lower priority unless the org is very large and complex.
- Depends on type of risks involved.

The standard deviation in responses was 1.09 indicating reasonable consensus between respondents. The grid position in box 1 of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 1.6 - Procurement strategy

Formulating sourcing strategies by product category and developing appropriate supply strategies.

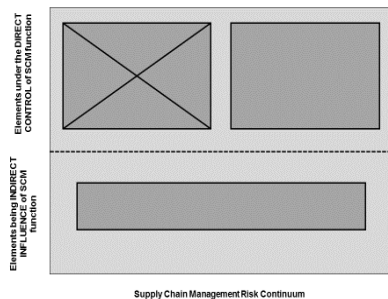
Qualitative feedback received from respondents by way of their comments were as follows:

- More formal organisations are very strong on this, but the smaller organisations are not strong.
- This aids in identifying the best course of action whether through contracting ....

- Procurement tends to be the most critical part of SCM in humanitarian spaces, where significant budgets can be spent. Thus it is of high importance at a local or country level, and at a regional or global level.

The standard deviation in responses was 1.11 indicating some difference of opinion between respondents. The grid position is in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 1.7 – Product development strategy

Influencing the product development process to improve supply chain performance during the life of the product service offerings design to align the SCM solution with the organisational mission.

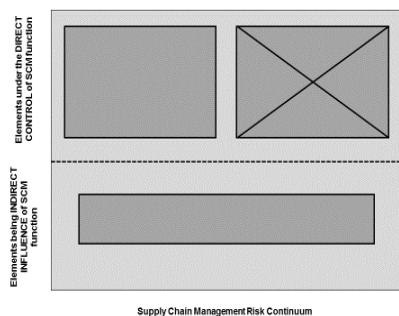
Qualitative feedback received from respondents by way of their comments were as follows:

- I do not think this element is relevant to HSCM.
- Product development is crucial for results (shelter initiative of IKEA and UNHCR does not work for example) Maybe minimum standards and Standardisation across this industry such as SPHERE standards
- I am amazed by the huge variety of items needed in programs where the target beneficiaries live such diverse lives in different climates, geographies and cultures! One size can never fit all
- Part of optimizing

- Difficult to see the owner of the design process across this supply chain
- Many organisations are not concerned about life cycle.
- Most originations are only interested in getting the job done. Are originations interested in the life of the product such as bio-degradable tents?
- This aids in making sure that right products are sourced hence the purpose of SCM
- Suggest to change the statement as SCM usually will not have direct influence to the product development process, rather as an supportive roles
- Very rare that products need to be designed uniquely. This can be true for a niche NGO, for example for Free Wheelchair mission customizes their chairs for poverty contexts, to be affordable and easily repaired

The standard deviation in responses were 1.07 indicating reasonable consensus between respondents. The grid position is in box 6 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions.

### Element 1.8 - Portfolio management of service offerings

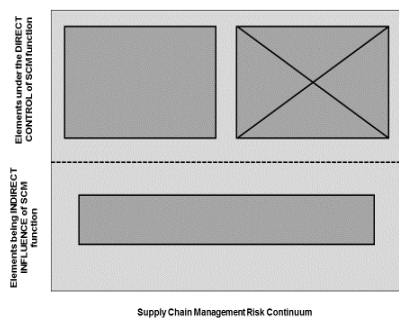
Optimising the portfolio of different products and services to reduce SCM complexity. This includes strategies such as postponement.

Qualitative feedback received from respondents by way of their comments were as follows:

- I do not think this element is relevant to HSCM. Product variety is driven by other aspects than in business.
- Continuous Improvement
- Important, but who owns this process
- Who will be the owner in such an organisations. Who will be the knowledgeable do-to person?
- Actively lobby regulatory body's to prioritise / waive approval of 'humanitarian' product requirements

The standard deviation in responses were 0.89 indicating reasonable consensus between respondents. The grid position is in box 6 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions.

### Element 1.9 – Customer Portfolio Management

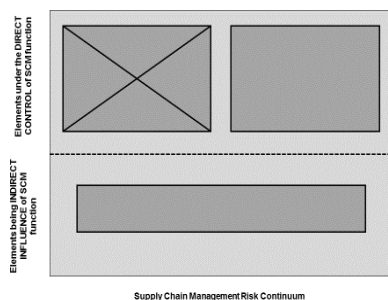
Evaluating product standardisation, for example through standards such as SPHERE for emergency response non-food items.

Qualitative feedback received from respondents by way of their comments were as follows:

- Customer satisfaction indicators aimed to positively influence shareholders and market capitalisation in CSCM vs. feedback of beneficiaries on impact to donors in HSCM.
- Problem is who the customer is. Donor? IP? Beneficiary?
- This is of higher importance as SCM matures, to improve response time and ensure quality, context and program needs are met.
- Customer satisfaction indicators aimed to positively influence shareholders and market capitalisation in CSCM vs. feedback of beneficiaries on impact to donors in HSCM.

The standard deviation in responses was 1.09 indicating reasonable consensus between respondents. The grid position is in box 3 of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

**Element 1.10 – Globalisation**

Low cost global sourcing vs premium in-country sourcing optimising the trade-off between cost, lead times and service levels.

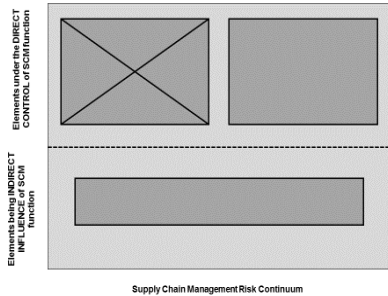
Qualitative feedback received from respondents by way of their comments were as follows:

- In supply chain strategy I miss something on local vs international sourcing in relation to transport (e.g. UNHCR says if one can buy locally for max. 15% more expensive than international you should do it). Low cost country sourcing is not that relevant.
- Expand on globalisation. It is more than global sourcing.
- I would say it is rather the costs and lead-times than this aspect. Local vs international sourcing is more relevant
- Many benefits to be obtained from LOCAL procurement as against seeking cheapest landed price. Benefit to local economy must be understood for roll-on impacts on long term need to continue aid. Also product servicing/spares issues.
- Service levels will also drive
- Tendency is moving, more Pan African continental strategy as opposed to globalisation
- Don't forget the need to consider buying locally to foster economic development within the community

The standard deviation in responses was 0.92 indicating reasonable consensus between respondents. The grid position is in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.





Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.2 Integrated business planning

Table 6.3.2 summarises the list of elements included under the key focus area of *supply chain management strategy*. The six elements will be discussed individually.

**Table 6.3.2: Elements included on the KFA of *integrated business planning***

SUMMARY OF RESEARCH FINDINGS OF THE INTEGRATED BUSINESS PLANNING KEY FOCUS AREA						
ELEMENT #	ELEMENT KEY WORD	Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY 3 = EFFECTIVE & EFFICIENT
		STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
2.1	Demand / Need Sensing	0.9	1	2	1	1
2.2	Demand Planning	1.0	2	2	1	1
2.3	Supply Planning	1.0	2	2	1	3
2.4	Demand / Supply Balancing (S&OP)	1.2	2	2	1	2
2.5	Operations Scheduling	0.9	2	2	1	2
2.6	Financial Appraisal	0.9	2	1	1	1

#### **Element 2.1 - Demand / Need Sensing**

Using various demand signals and forecasting methodologies to capture real need or anticipated need across products and regions. In CSCM, this includes demand signals such as POS data and pipeline inventory in the trade.

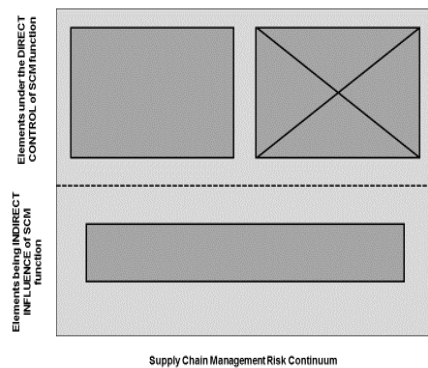
Qualitative feedback received from respondents by way of their comments were as follows:

- “THE” aspect that is lacking in most humanitarian organisations.
- Needs to demonstrate to donor, needs to have effective signals, no patterns in once off events.

- Planning is good, but you invariably miss the response timing.
- Predict demand for HIV or Malaria medications.
- Highlights the need to plan better.
- Donor response is not guaranteed.
- Says that the response time is so long that the SCM does have time to respond. Every organisation has its own requirements, hence the slow response time. Org where the response need to deliver, the political implications of "who the donor is".
- Point of Sales might not applicable to Humanitarian in general? Unless for the Food distribution?
- Important in a slow onset disaster, such as Ebola, where critical supplies will depend on forecasting quantity, location, impact, etc.
- Best case scenario, we are in a leading position, where we can sense proactively the demand. In reality, the maturity of most HSCM organisation put SCM in a lag position.
- International Trade Manager working in the for-profit sector serving humanitarian supply environments commented: "accurately sensing demand would help reduce waste, leading to greater efficiency".
- Early warning systems through DRR programs are well funded by governments as a way of reducing risk and poverty.
- The donor is not really concerned about the mechanics, results are more important.

The standard deviation in responses was 0.93 indicating reasonable consensus between respondents. The grid position is in box 1 of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions.

## **Element 2.2 - Demand Planning**

Demand forecasting across the different products, sales regions and customer groupings.

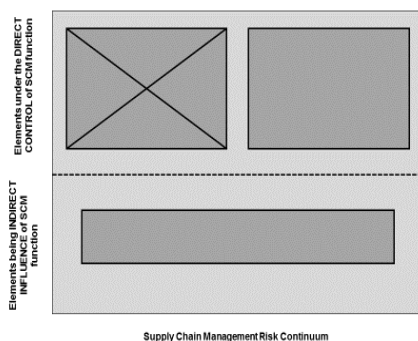
Qualitative feedback received from respondents by way of their comments were as follows:

- As humanitarian SCM generally operating in unsophisticated economies, much of these concepts are theoretical - we have neither the trained staff nor sectoral support available.
- The fact that this is difficult does not make this unimportant, any improvement here would make big improvements on the delivery.
- Predict demand for HIV or Malaria medications.

- This helps in coming up with reliable forecasts, revenue and inventory.
- Generally not so important, except in emergency preparedness, though very difficult to do with accuracy.
- Ensure effectiveness, but provide the proper information for supply optimisation, therefore better efficiency.
- Most donors are requiring procurement plans alongside the proposals. Meaning reduced flexibility with the cash and more visibility on the demands.
- This, I see high importance as most governments strategies on funding are annual and not flexible on increase. The Challenge for Humanitarian agencies is to ensure they maintain same levels of funding by good performance.

The standard deviation in responses was 0.98 indicating reasonable consensus between respondents. The grid position is in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 2.3 - Supply Planning**

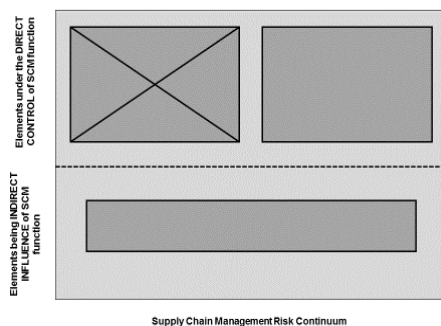
Planning the fulfilment of beneficiary needs from different sources of supply such as inventory, manufacturing and strategic sourcing agreements. This includes concepts such as virtual inventory and pre-stocking.

Qualitative feedback received from respondents by way of their comments were as follows:

- In particular moving away from traditional frame agreements that only dictate price to 'proper' contracts that also contain e.g. volume commitments.
- There is no systems to do this effectively but similarly can make a difference.
- This helps in coming up with reliable forecasts, revenue's and inventory.

The standard deviation in responses was 0.98 indicating reasonable consensus between respondents. The grid position is in box 1 of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 2.4 - Demand / Supply Balancing**

Performing trade-offs to balance insourcing vs. outsourcing. ('Make or Buy' strategies) and 'Demand constraining' at 'Rough Cut Capacity Planning levels of accuracy'. Aligning constrained demand with capacity optimisation.

Qualitative feedback received from respondents by way of their comments were as follows:

- You may as well call this Sales and Operations Planning for CSCM.
- It seems that flexible strategies may have a bigger influence.
- Need to demonstrate that this aspect / element of the SCM is significantly covered.
- Supplier problem.
- Mainly in emergencies, this becomes important with constrained supply and competing demand.

**This element will be excluded from the framework due to the high level of discrepancy following two rounds of empirical surveys as well as some contradictory comments.**

### **Element 2.5 - Operations Scheduling**

Scheduling operations to execute supply plans. This includes identifying capacity constraints such logistics access to logistics nodes, supply capacity and deployable skills in advance.

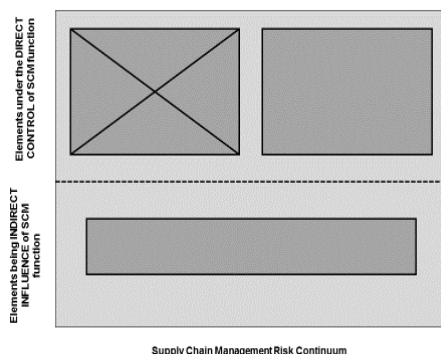
Qualitative feedback received from respondents by way of their comments were as follows:

- It is somewhat less relevant because it is often impossible to schedule in detail.

- Ensure back up supply solutions e.g. dual sourcing.
- Required by Donor and beneficiary.
- Donors want to see this, as well as the leadership representing the beneficiaries.
- I am not sure if this is where you put procurement planning with program demand, but that is the most critical element especially in community development work. Also highly critical in emergency related supply.
- While the donors are not going to worry specifically about how the operations are running, there priority will bet to ensure products reach the beneficiaries, then cost & efficiency comes into play. Some donors will only fund products to get into a Central medical Warehouse and won't worry beyond that.

The standard deviation in responses was 0.95 indicating reasonable consensus between respondents. The grid position is in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

## **Element 2.6 - Financial Appraisal**

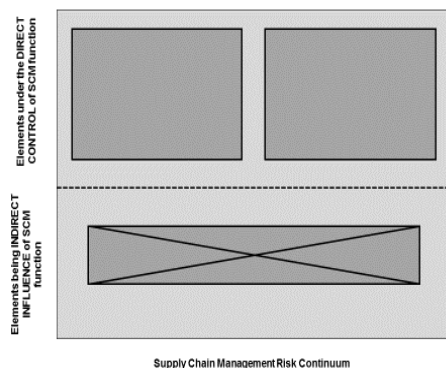
One needs money, goods and skilled labour to effect humanitarian programming. This element includes justification and quantifying the funds that need to be raised based on anticipated needs and initial assessments.

Qualitative feedback received from respondents by way of their comments were as follows:

- Overspend to budget for both HSCM and CSCM, but in HSCM, underspend on programming can be compared to CSCM's underspend of Capital Expenditure request.
- Particularly the availability of qualified staff is essential.
- Very important.
- Money is important because it will be exchanged for goods and services.
- Value for money and having a clear transparent procurement process to demonstrate this is critical, especially to grant funders.

The standard deviation in responses was 0.91 indicating reasonable consensus between respondents. The grid position is in box 1 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- **NOT** being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations but will be included in the cross functional list of elements that needs to be coordinated between functions.



### 6.3.3 Logistics integration

Logistics integration has been divided into three sub-categories for the purposes of this research. These three sub-categories are i) Transport Management, ii) Freight Forwarding and Clearing and iii) Warehousing and Facilities Management. The results of the relative position and standard deviation of each logistics integration element will be discussed separately below.

#### 6.3.3.1 Transport and Distribution Management

Table 6.3.3.1 summarises the list of elements included under the key focus area of *Transport and Distribution Management*. The five elements will be discussed individually.

**Table 6.3.3.1: Elements included on the KFA of *Transport and Distribution Management***

SUMMARY OF RESEARCH FINDINGS OF THE TRANSPORT AND DISTRIBUTION MANAGEMENT KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
3.1.1	Global Supply Chain Integration	1.0	2	2	1	2
3.1.2	Developing global logistics strategies	1.0	2	2	1	2
3.1.3	Multi-Modal Solutions	0.9	2	2	1	2
3.1.4	Transport Operational Management	1.0	2	2	1	1
3.1.7	Fleet Management	1.2	1	2	1	2

#### **Element 3.1.1 - Global Supply Chain Integration**

Developing a global supply chain strategy across different trading zones and continents.

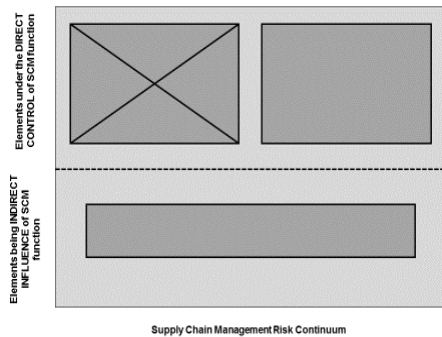
Qualitative feedback received from respondents by way of their comments were as follows:

- Maybe this element belongs with Globalisation and/or global sourcing.

- Needed in particular for emergency responses.
- Can have impact on Effectiveness but case by case basis. Global control can bring inefficiencies and costs. Something to be said for people on the spot making the decisions.
- Too many organizations without central planning or connection.
- Could be negative if not adequately managed.
- Where does the product go, e.g. Somalia, DRC, Supply chain operates in Silos, and the SCM actor does not experience the urgency like the beneficiary representative such as port congestion. Must build in extra cost of in country constraints and congestion.
- Recently The Australian Government Entered into Contract with CoCaCola to Provide Supply Chain for its Humanitarian Response due to efficiency and low cost in private companies.
- Based on experience he also struggled to get a global strategy. It was too time consuming and expensive. Prohibitive.
- This is an added benefit but not key.

The standard deviation in responses was 0.97 indicating reasonable consensus between respondents. The grid position is in box 3 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.1.2 - Developing global logistics strategies**

Develop global logistics solutions that can move products across the world including freight consolidation and corridor optimisation.

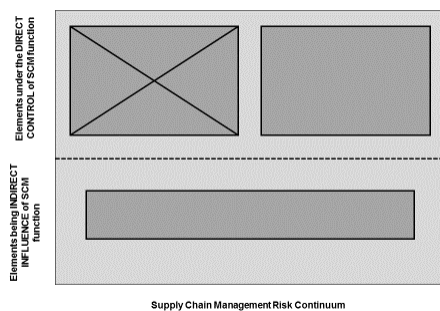
Qualitative feedback received from respondents by way of their comments were as follows:

- Needed in particular for emergency responses.
- It needs to be coordinated case by case, difficult to plan and execute globally.
- Could be negative if not adequately managed.
- Relatively easy up to a point but best is to make use of global logistics service providers.
- This burden is mostly on the suppliers or outsourced. NGOs don't typically need to focus on this.
- Some donors are keen on global logistics solutions. The example of the recent agreement with Coca Cola Australia is a great example.

- Global strategies is the right thing to do, but the opportunity costs were too high and it was too complicated. Growing from regional to global does not create much incremental benefit.

The standard deviation in responses was 1.02 indicating reasonable consensus between respondents. The grid position is in box 3 of the nine grid matrix summary (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.1.3 – Multi-Modal Solutions**

Seamless integration between road – rail – water – air modes of transport.

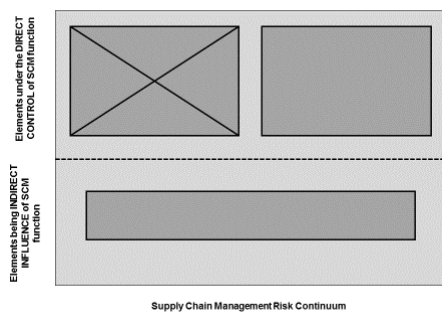
Qualitative feedback received from respondents by way of their comments were as follows:

- Relevant from cost perspective (and maybe 'greenness') but in emergencies helpful to spread out supplies over time.
- Difficult to influence.

- Relatively easy up to a point but best is to make use of global logistics service providers.
- Could be negative if not adequately managed.
- Mostly fixed by suppliers except for in country and last mile delivery.
- Donors are selfish, they do not share the glory, and they want to be seen to be there first. Therefore, will NOT support integration. Only Large UN bodies can afford to sustain Multi-Modal Solutions due to reliable Government Funding through the UN secretary general.
- Model in provision of UNHAIS, yet it is always challenged with meeting overheads, almost becoming commercial. The thinking is 50/50%.

The standard deviation in responses was 0.92 indicating reasonable consensus between respondents. The grid position is in box 3 of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.1.4 - Transport Operational Management**

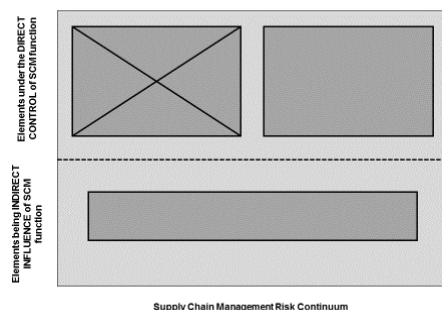
Managing transport operations from sales order to final delivery.

Qualitative feedback received from respondents by way of their comments were as follows:

- Make do with what you have.
- International Transport issues will differ from region to region. In Africa, one has to use what one has. In other continents, it may differ. Just as in Africa, we have Ubuntu, in South America, it is much more difficult to transship between South American countries.
- Purchase Order. Monitor from order to pay.
- Additional to add on: Distribution management, shall this be added in as is important for transportation management and delivery arrangement base on the distribution sites.
- Largely managed by suppliers or transporters. More critical or complex in emergency where infrastructure is affected. Risk can be higher in less secure contexts (theft, accidents).

The standard deviation in responses was 1.00 indicating reasonable consensus between respondents. The grid position is in box 3 of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.1.5 - Managing Transport Risk**

Managing all risks related to international transport of products, this includes aspects such HAZCHEM.

Qualitative feedback received from respondents by way of their comments were as follows:

- Risk management lower on priority list than urgent execution
- Not an issue if packed appropriately, hence, the strategy is important.
- Since most transport ops are outsourced, this is difficult to control, but can have a large impact on NGO reputation or donor impact depending on the incident.

**This element was excluded following the second round survey due to its relatively low rating in the 9 grid matrix.**

### **Element 3.1.6 - Reverse Logistics**

Managing product and packaging returns through reverse logistics processes.

Qualitative feedback received from respondents by way of their comments were as follows:

- Most of the times things are solved locally. And with medicines you hardly can export stuff again. Complicated point.
- Not high on priority list, never materialize.
- Will give confidence if managed / addressed and could be negative if not adequately integrated and managed.
- To return goods is a nightmare, so the standard is to leave behind. The Donor will be impressed with the existing of a strategy.
- Reverse Logistics is not to return the original goods.
- Contractor would want to return tools and equipment.

- Sharon: This is generally uncommon, as most assets will be given to beneficiary.
- Because in his experience, he always struggled to make people in the field aware of the benefits.

**This element was excluded following the second round survey due to its high level of disagreement between the respondents as well as its low position in the nine grid matrix.**

### **Element 3.1.7 - Fleet Management**

Total fleet lifecycle management of assets being deployed during programming. This element includes vehicle repatriation after completion of a program.

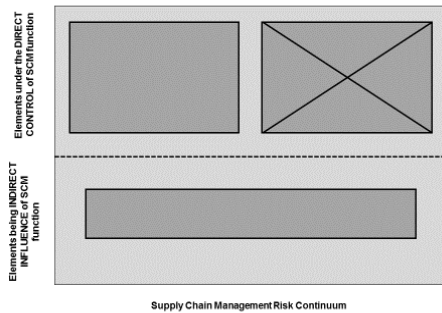
Qualitative feedback received from respondents by way of their comments were as follows:

- Vehicles are dispensable items and best left behind.
- More important for minimising costs and improving efficiency of vehicle use. Only substantial if there is a very large fleet.
- Without good Fleet management it is impossible to implement program. Most Vehicles are classified as Assets by MOST Donors. They track the asset and therefore high on importance. Poor management can lead to reduced funding and withdrawal of the assets.

The standard deviation in responses was 1.16 indicating some disagreement between respondents. However, the grid position is in box 3 of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of efficiency, and
- a lead indicator





Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions.

### 6.3.3.2 Freight Forwarding and Clearing

Table 6.3.3.2 summarises the list of elements included under the key focus area of *Freight Forwarding and Clearing*. The seven elements will be discussed individually.

**Table 6.3.3.2: Elements included on the KFA of *Freight forwarding and Clearing***

SUMMARY OF RESEARCH FINDINGS OF THE FREIGHT FORWARDING AND CLEARING KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
3.2.1	International Trade	1.0	2	1	1	1
3.2.2	Clearing	1.1	2	2	1	2
3.2.3	Forwarding	1.0	2	2	1	2
3.2.4	Incoterms	1.1	2	2	1	1
3.2.5	Invoicing and Terms	1.1	1	1	1	1
3.2.6	Disbursements	0.9	2	2	1	1
3.2.7	Foreign Currency & Foreign Exchange management	1.0	2	1	2	2

#### Element 3.2.1 - International Trade

International trade regulations which controls the flow of product and funds across different trading zones.

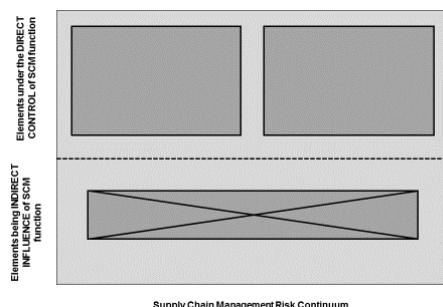
Qualitative feedback received from respondents by way of their comments were as follows:

- Do you mean the existence or the actual use of these regulations?

- Can have a big effect on effectiveness, can benefit on global rules for delivery of aid.
- Need to demonstrate / relay confidence / ensure there will be no 'unforeseen' issues.
- Has never come up as a strategy during the contracting stages of the engagement, but necessary for the execution.
- Not a major issue or barrier regarding humanitarian goods and services.
- Most big donors specify where you cannot buy certain commodities from, that impacts the cost of programming. With the Trade sanctions towards certain countries, program is impacted negatively and cannot guarantee increased funding.
- Cross border operations is affected by Customs agreements and impacts on Lead Time, and type of programming that can be done within a particular region. Example, it's difficult to import drugs into Uganda, the government procedure is cumbersome on inspection and certification, increases lead-time and cost etc. Certain regions are not friendly to Chinese human drugs etc.
- 50/50 as most donors dictate where you CANNOT buy from. The Country of Sudan is under TRADE sanctions, and therefore International Trade impacts programming negatively in that Country.
- He understands the importance and benefits but it was difficult to move from national to regional to global will be even more difficult.

The standard deviation in responses was 1.0 indicating reasonable consensus between respondents. The grid position is in box 6 of the nine grid matrix (table 5.4.1). This element has been rated as:

- **NOT** under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will not be included in the two frameworks under the direct control

of supply chain organisations but will be included in the cross functional list of elements that needs to be coordinated between functions.

### **Element 3.2.2 - Clearing**

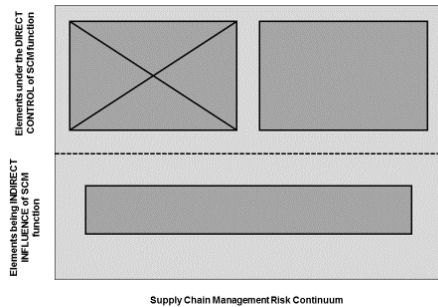
Clearing imports through the customs process which includes efficient processing of taxes and levies.

Qualitative feedback received from respondents by way of their comments were as follows:

- An area that caused problems in Mongolia. Red tape was stifling causing delays up to a month receiving urgently needed goods.
- Critical.
- Need to demonstrate / relay confidence / ensure there will be no 'unforeseen' issues.
- Additional fees to get the freight cleared, failed states is the biggest problem.
- Even if you plan it will not help the SCM to be more effective or efficient.
- When they speak to the governing authorities, they are keen to support but the silos' fails the SC when execution happens.
- This can have a large impact especially in emergencies. Also can result in high costs and penalties if not handled well.

The standard deviation in responses was 1.1 indicating sufficient consensus between respondents. The grid position is in box 6 of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.2.3 - Forwarding**

Forwarding and pre-clearing documentation to facilitate smooth change of ownership in compliance with all on customs rules.

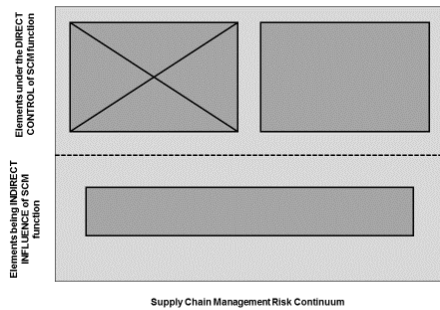
Qualitative feedback received from respondents by way of their comments were as follows:

- Critical.
- Additional fees to get the freight cleared, failed states is the biggest problem.
- Even if you plan it will not help the SCM to be more effective or efficient.
- When they speak to the governing authorities, they are keen to support but the silos' fails the SC when execution happens.
- Important for customs clearance.
- I think the rating is high as no donor want to pick an unplanned cost i.e. demurrage costs etc. Advocacy is done through embassies to ensure smooth change of Most agencies pay from unrestricted funds.
- Impact is high if it goes wrong.

The standard deviation in responses was 0.92 indicating reasonable consensus between respondents. The grid position is in box 3 of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;

- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation

### **Element 3.2.4 - Incoterms**

Intentional selection of incoterms to optimise freight density and to minimise risk.

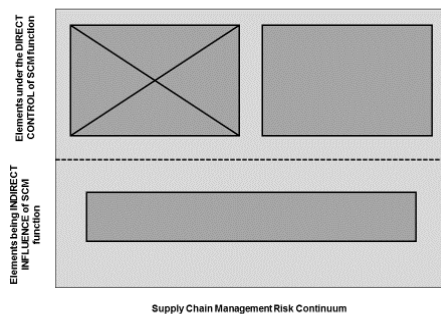
Qualitative feedback received from respondents by way of their comments were as follows:

- Critical.
- Need to demonstrate / relay confidence / ensure there will be no 'unforeseen' issues.
- Critically important, most buyers want to protect themselves.
- HSCM expect DDU.
- Most want Ex Works.
- Poor application of incoterms can have negative impact on donor funds.
- I raised a rating to 3 in the section just because that incoterms are the rules, if practised right than support to mitigate risks dealing with international shipment but i am not so sure that how much the donor are interested to such details and that would the reason of low rating initially from my side.

The standard deviation in responses was 0.97 indicating reasonable consensus between respondents. The grid position is in box eight (8) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator

This element was carefully considered for inclusion or exclusion following the second round of empirical research. Although the actual rating is low on the 9 box grid matrix, the comments from the respondents convinced the author to include this element in the framework.



Therefore, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.2.5 - Invoicing and Terms**

Invoicing and payment of taxes and import levies related to imported products. This includes payment types and terms as well as trading in foreign currency trading.

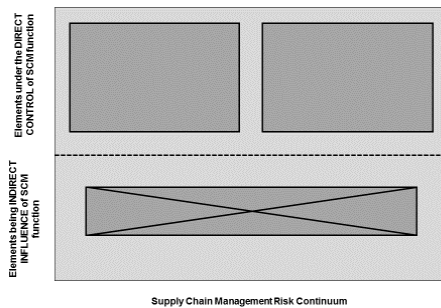
Qualitative feedback received from respondents by way of their comments were as follows:

- Is this finance only?

- Handled in conjunction with finance.

The standard deviation in responses was 1.09 indicating reasonable consensus between respondents. The grid position is in box six (6) of the nine grid matrix (table 5.4.1). This element has been rated as:

- NOT being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator



Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations but will be included in the cross functional list of elements that need to be coordinated between functions.

### **Element 3.2.6 - Disbursements**

Making payments of all costs, taxes and levies to the correct parties. This includes accurate cost allocations.

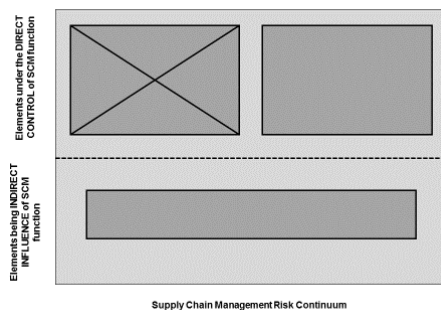
Qualitative feedback received from respondents by way of their comments were as follows:

- This is for finance only?
- Need to demonstrate confidence.
- Depending on the Donor's expectations.
- Handled by finance.
- Was very important in his experience.

- I am confident with my initial rating but I am surprised how the other participants have given low rating to this factor because this about the control, transparency and accountability to do the payment to the right party and this would improve donor trust and confidence.

The standard deviation in responses was 0.90 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 3.2.7 - Foreign Currency & Foreign Exchange management**

Optimising the management of foreign exchange for imported products in terms of exchange rules. This includes currency hedging.

Qualitative feedback received from respondents by way of their comments were as follows:

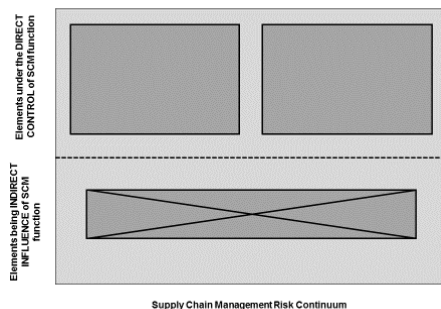
- This is finance only?
- Fix pricing in Dollar and use as a common trading currency.



- Need to Demonstrate confidence / control of funds - could have a severe impact on available funds.
- Mostly fixed price contracts in USD.
- Handled by finance.
- My thinking was in the example of UNICEF where they source majority of their supplies from their Copenhagen centre, MSF source their supplies from their HQ Belgium, and ICRC from Switzerland etc. These are developed economies where the currencies are stable and little affected by foreign exchange. Donors are happy to know how far their funds can go.

The standard deviation in responses was 1.0 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- NOT being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations but will be included in the cross functional list of elements that needs to be coordinated between functions.

### 6.3.3.3 Warehousing and Facilities management

Table 6.3.3.3 summarises the list of elements included under the key focus area of *Warehousing and Facilities management*. The five elements will be discussed individually.

**Table 6.3.3.3: Elements included on the KFA of Warehousing and Facilities management**

SUMMARY OF RESEARCH FINDINGS OF THE WAREHOUSING AND FACILITIES MANAGEMENT STRATEGY KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
3.3.1	Facility location	0.8	2	2	1	2
3.3.2	Facility Design & Layout	0.9	2	2	1	2
3.3.3	Facilities Operational Management	1.0	2	2	1	2
3.3.4	Inventory control	0.9	2	2	1	2
3.3.5	Materials Handling	1.0	2	2	1	2

### Element 3.3.1 – Facility location

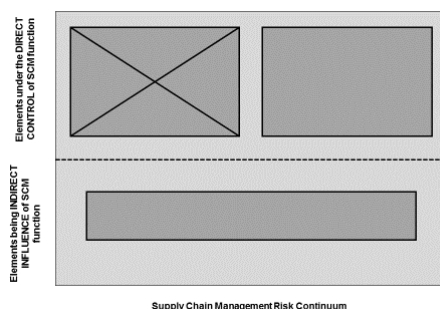
Network optimisation commensurate with the various channels taking cognisance of the in-country capacity constraints and regulatory obstacles.

Qualitative feedback received from respondents by way of their comments were as follows:

- Can establish a footprint through alliances.

The standard deviation in responses was 0.84 indicating sufficient consensus between respondents and the grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and can hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 3.3.2 – Facility design and layout

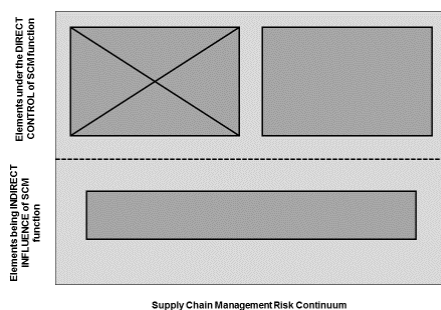
Design the physical flow, infrastructure and skilled labour to be used in facilities.

Qualitative feedback received from respondents by way of their comments were as follows:

- Make do.
- Depending on donor requirements such as separation of food vs non-food items (NFI).

The standard deviation in responses was 0.95 indicating sufficient consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and can hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 3.3.3 – Facilities operational management

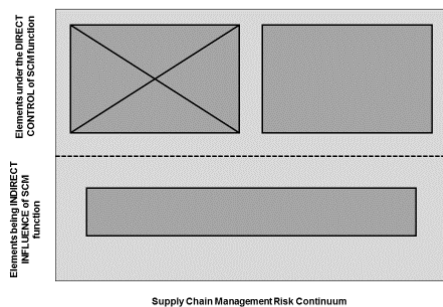
Managing all operations within facilities, such as receiving, picking, staging and despatch.

Qualitative feedback received from respondents by way of their comments were as follows:

- This is vital. These operational folk are all expats, but the local folk does not want Ex Pats.

The standard deviation in responses was 1.01 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and can hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 3.3.4 – Inventory control

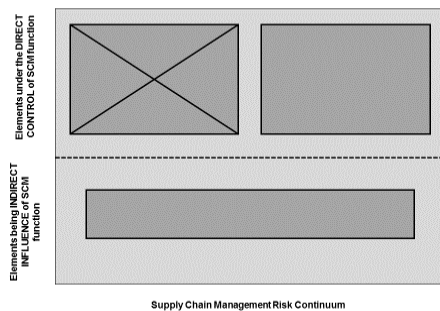
Controlling all inventory to limit losses through shrinkage or damage.

Qualitative feedback received from respondents by way of their comments were as follows:

- Important to the donor, but not to the beneficiaries.
- Critical especially for food and medicine, perishables. High risk of loss, corruption and fraud exist.

The standard deviation in responses was 0.87 indicating sufficient consensus between respondents. The grid position is in box one (1) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and can hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### Element 3.3.5 – Materials handling

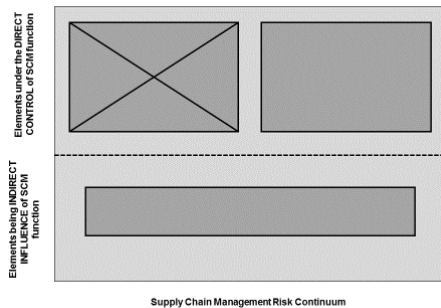
Handling of different materials through the warehousing process to minimising risk and optimising cost efficiency.

Qualitative feedback received from respondents by way of their comments were as follows:

- Big issue in Africa, materials handling equipment often times too late.
- Critical especially for food and pharmaceuticals.
- Efficiency enable reaching our customer objectives (effectiveness).

The standard deviation in responses was 0.99 indicating sufficient consensus between respondents. The grid position is in box three (3) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and can hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.4 Demand management

Table 6.3.4 summarises the list of elements included under the key focus area of *Demand management*. The two elements will be discussed individually.

**Table 6.3.4: Elements included on the KFA of *Demand management***

SUMMARY OF RESEARCH FINDINGS OF THE DEMAND MANAGEMENT STRATEGY KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
4.1	Donor Relationship Management	0.7	2	2	1	1
4.2	Order Management	1.0	2	2	1	1

#### Element 4.1 - Donor Relationship Management

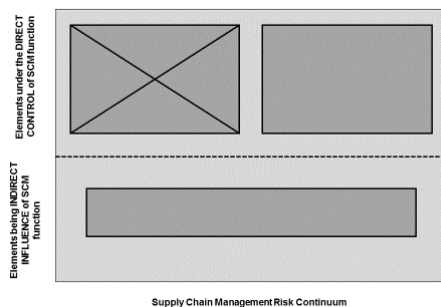
Feedback received from a Humanitarian Organisations' Chief Logistics Officer was to change question 4.1 from Customer Relationship Management to Stakeholder Relations Management.

Qualitative feedback received from respondents by way of their comments were as follows:

- This is what it is all about.

The standard deviation in responses was 0.74 indicating sufficient consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and can hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

## Element 4.2 - Order Management (Sales orders or demand execution)

Ensuring fulfilment of field requirements.

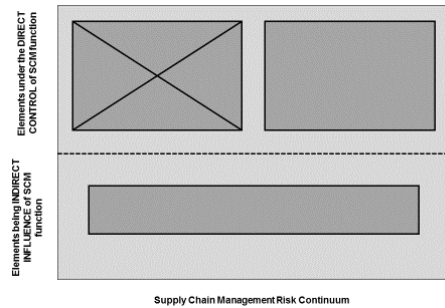
Qualitative feedback received from respondents by way of their comments were as follows:

- In Mongolia the relationships between ADPs and SCM caused much pain and friction. Lack of Operational willingness to plan and co-operate was heartbreaking for SCM staff.
- Change question from Sales Order Management to demand execution.

The standard deviation in responses was 0.99 indicating sufficient consensus between respondents. The grid position is in box one (1) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;

- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.5 Supply execution (Plan to Procure to Pay)

Table 6.3.5 summarises the list of elements included under the key focus area of *Supply Execution*. The four elements will be discussed individually.

**Table 6.3.5: Elements included on the KFA of *Supply Execution***

SUMMARY OF RESEARCH FINDINGS OF THE SUPPLY EXECUTION (PLAN TO PROCURE TO PAY) KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY 3 = EFFECTIVE & EFFICIENT
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
5.1	Purchasing planning	1.0	2	2	1	3
5.2	Requisition process	1.1	2	2	1	1
5.3	Purchasing Execution	1.1	2	2	1	2
5.4	Accounts payable process	1.0	2	2	2	2

#### **Element 5.1 - Purchasing planning**

Annual procurement plans (APPs) are in place. Procurement provides input on price, quality specifications and delivery lead times. These APPs are reviewed quarterly. Implementation plans are tabled for each emergency response and are 80% accurate.

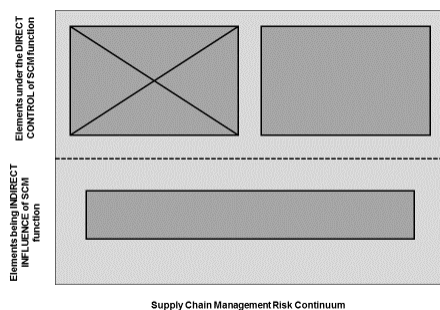


Qualitative feedback received from respondents by way of their comments were as follows:

- The most difficult aspect of SCM in Mongolia and the only area that gave rise to International Audit comment. SCM staff tried so hard and hit a brick wall with most ADP staff.
- Risk is high on continuity of money and supply.
- Very important to the Donor, and it is difficult to get this approved by the Donor, but not used afterwards.
- From a procurement standpoint, it is important that the products being procured are the right ones (in terms of being the right drug for the specific disease, preferably the one that will have the most impact, then it will need to be on the EML, many times this process takes a long time, so lesser optimal drugs will be procured). The right specs needs to be in place and sufficient manufactures to support the demand needed. Market Dynamics is a big focus areas for donors.
- Rather default to a rolling procurement forecast.

The standard deviation in responses was 1.05 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness and efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 5.2 - Requisition process**

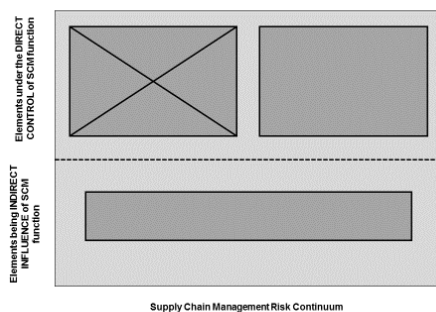
Managing the sourcing execution process from need identification to payment.

Qualitative feedback received from respondents by way of their comments were as follows:

- Must match budget approvals.
- NGO's are not deeply involved in this.

The standard deviation in responses was 1.11 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 5.3 - Purchasing Execution**

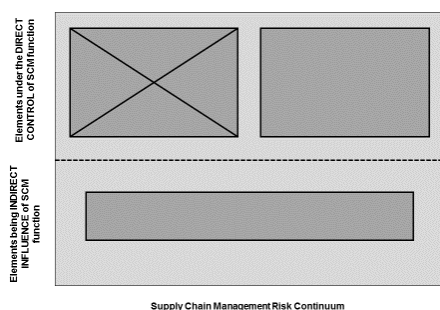
No untoward or undue influence to accept non-competitive bids are tolerated

Qualitative feedback received from respondents by way of their comments were as follows:

- Goods and services purchased are good value for money and those involved in procurement have no conflict of interest.
- INDICATORS
  - Multiple quotations are obtained for higher value purchases.
  - No single person can enact a procurement process from end to end.
  - No actual or perceived conflicts of interest occur.
  - Purchases are authorized.
- MEASUREMENTS
  - The lowest quotation is accepted, or the rationale for accepting a higher. Quotation is documented and stands up to scrutiny.
  - The segregation of duty matrix.
  - Allocates responsibility for key parts of a purchasing process to different roles.
  - Authorisations are demonstrated either by system access controls or by signature or email approval being retained with supporting documentation.

The standard deviation in responses was 1.06 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

#### **Element 5.4 - Accounts payable process**

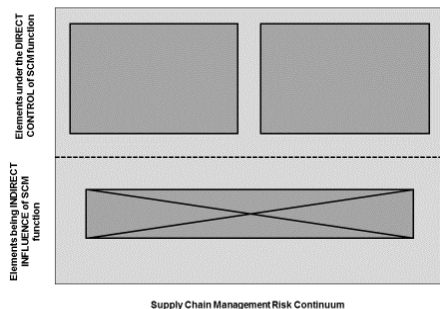
Accounts are paid on due dates (not early or late) and no product or service are held back due to accounts being on hold.

Qualitative feedback received from respondents by way of their comments were as follows:

- This is finance only? May only have effect if suppliers do not clear because of payment issues.
- Important to donor but two respondents disagreed stating this is an administrative process under the control of finance.

The standard deviation in responses was 0.96 indicating sufficient consensus between respondents. The grid position is in box three (3) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lag indicator.



After careful consideration and evaluation of the comments, this element will not be included in the two frameworks under the direct control of supply chain organisations but will be included in the cross functional list of elements that needs to be coordinated between functions.

### 6.3.6 Fulfilment management

Table 6.3.6 summarises the list of elements included under the key focus area of *Fulfillment Management*. The two elements will be discussed individually

**Table 6.3.6: Elements included on the KFA of *Fulfilment Management***

SUMMARY OF RESEARCH FINDINGS OF THE FULFILMENT MANAGEMENT STRATEGY KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
6.1	Align supplier's manufacturing strategy.	1.3	1	2	1	2
6.3	Execution Management	0.9	2	2	1	1

**Element 6.1 - Align supplier's manufacturing strategy with own desired logistics concept.**

Determine which supplier strategy selecting form 'make-to-stock', 'assemble-to-order', 'make-to-order', 'purchase-to-order' and 'engineer to order' will best suit the desired channel strategy.

Qualitative feedback received from respondents by way of their comments were as follows:

- I think this is irrelevant and up to the manufacturer to decide - dependent on requirements
- Manufacturers play a stronger role
- Only important for the reason that it must be executed
- Only important for the reason that it must be implemented
- Lead-time is important but how they do their mfg., doesn't really matter
- Not in MSF environment
- Very important in his experience

**Due to the relative high levels of disagreement between the respondents during both rounds and based on the comments received by some respondents, this element will be excluded from the framework.**

### **Element 6.2 - Consignment design**

Consignment and packaging design aligning specifications with receiving facility capacity, capability and limitations.

Qualitative feedback received from respondents by way of their comments were as follows:

- Packaging is Important where transport infrastructure is undeveloped, also for the Donor. Certified wood crates and pallets, load distribution and packaging
- It depends on the commodity, the inco terms, the frequency of distribution, etc .It is easier do consignment stock to Kenya but probably not to Burundi. Consignment stock can be fine for many commodities but can also be high risk for the suppliers if they are not getting the right demand numbers
- Reconsidered impact in the case of it going wrong

**Due to the relative high levels of disagreement between the respondents following the second survey, as well as its low positioning on the nine grid matrix, this element will be excluded from the framework.**

### **Element 6.3 - Execution Management**

Managing the execution process including quality management systems

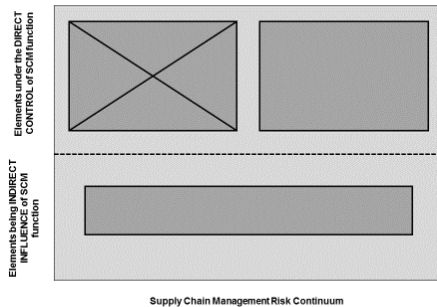
Qualitative feedback received from respondents by way of their comments were as follows:

- Quality Management is critical and has high impact & high visibility from donors.

The standard deviation in responses was 0.93 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;

- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.7 Supply Chain Visibility

Table 6.3.7 summarises the list of elements included under the key focus area of *Supply Chain Visibility*. The two elements will be discussed individually.

**Table 6.3.7: Elements included on the KFA of *Supply Chain Visibility***

SUMMARY OF RESEARCH FINDINGS OF THE SUPPLY CHAIN VISIBILITY KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
7.1	Systems & Technology Implementation	1.1	2	2	1	2
7.2	Systems & Technology Risks	1.0	2	2	1	2

#### **Element 7.1 - Systems & Technology Implementation**

Using systems and technology to enable synchronised supply chain processes and functions through 360 degree shared information.

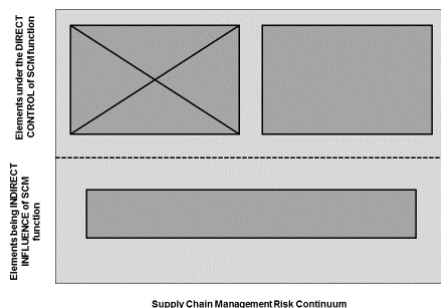
Qualitative feedback received from respondents by way of their comments were as follows:

- Modern SCM and ERP systems have configurable, inbuilt business process modelling beginning with strategy and goals which are decomposed into fully documented business processes directly associated with system transactions. These are based on generic frameworks or enhanced best practices. Not just Visio diagrams but process flows integrated with the software itself. Not directly visible to donors but would provide some assurance of a professional SCM function and best practices.

- Potential for major improvements in HSCM space which is generally years (decades?) behind the commercial sector in this area. Funding priorities, technical expertise and the ability to digest new technology and processes limit progress in this area. I still believe that the commercial models and software could operate well in this space with some refinements, e.g. grant management, and project management.
- Needed for all of the above.
- Large org's IT and info sharing is shocking. This is not important to the donor, but for the executioners.
- Essential for step change advances in SCM, especially driving cost avoidance, visibility and speed.
- Data is more critical than Systems, the data has to be correct first and then systems can be put on top of that, Systems will help to scale faster.

The standard deviation in responses was 1.11 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.



## **Element 7.2 - Systems & Technology risks**

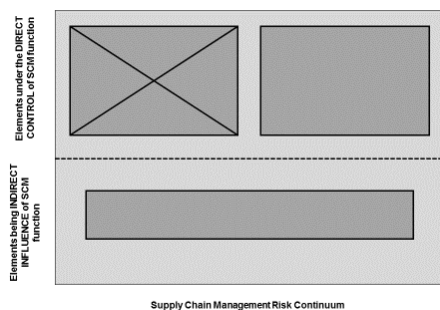
Mitigating risks of poor connectivity through technologies such as 'off-line' capability of information systems

Qualitative feedback received from respondents by way of their comments were as follows:

- Probably more important for first line emergency responders. This will become less and less of a factor as technology (e.g. mobile) and communications improve rapidly over time.
- Needed in practice.
- Connectivity is really the issue.
- The bigger risk is NOT having a system to virtually eliminate major issues of fraud, corruption and process violation. A system ensures accountability and step change reductions in controls violations.

The standard deviation in responses was 0.95 indicating sufficient consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.8 Internal processes and risk management

Table 6.3.8 summarises the list of elements included under the key focus area of *Internal Processes and Risk Management*. The five elements will be discussed individually.

**Table 6.3.8: Elements included on the KFA of *Internal Processes and Risk Management***

SUMMARY OF RESEARCH FINDINGS OF THE INTERNAL PROCESSES & RISK MANAGEMENT KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
8.1	Demand stability vs. volatility	1.1	2	2	1	2
8.2	Supplier performance and reliability	1.1	2	2	1	2
8.3	Economic climate of supply market	0.9	2	2	1	2
8.4	Labour climate in the country and origin	1.1	2	1	1	1
8.5	Long Shipping line vs. sourcing locally	0.9	2	2	1	1

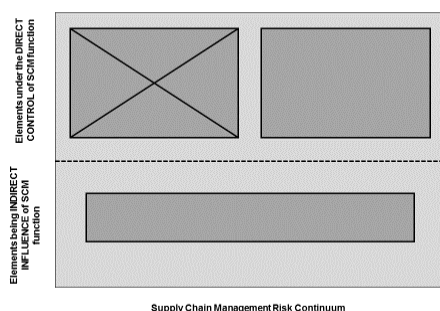
#### Element 8.1 - Demand stability vs. volatility

Lack of demand visibility or huge demand volatility may lead to excess inventory and / or obsolescence

No qualitative feedback was received from respondents.

The standard deviation in responses was 1.09 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 8.2 - Supplier performance and reliability**

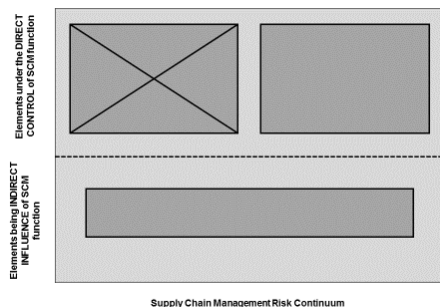
Supplier performance is monitored and supplier dashboards are shared. Corrective actions are taken and suppliers are switched out if poor performance continues.

Qualitative feedback received from respondents by way of their comments were as follows:

- Supplier management vs performance.

The standard deviation in responses was 1.08 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 8.3 - Economic climate of supply market**

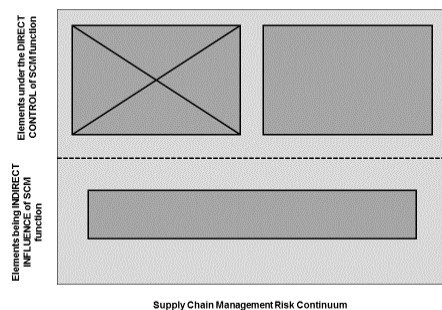
Determine whether the supply market is a buyer's or seller's market.

Qualitative feedback received from respondents by way of their comments were as follows:

- Donor normally wants to appoint people and contractors.
- Often donors are loyal to their country of origin or the country who sponsors the funding.

The standard deviation between responses was 0.90 indicating sufficient consensus between respondents. The grid position is in box six (6) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Although the relative importance to programming excellence and relative impact on donor confidence has been rate just above average, it was decided to include this element in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

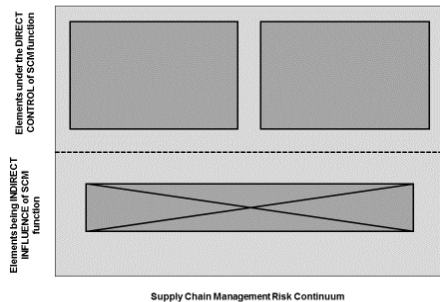
#### **Element 8.4 - Labour climate in the country and origin**

Is the labour situation stable, highly unionised, militant and demanding leading to poor efficiencies and high producer price inflation?

No qualitative feedback was received from respondents.

The standard deviation in responses was 1.05 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- NOT being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations but will be included in the cross functional list of elements that needs to be coordinated between functions.

### **Element 8.5 - Inbound supply chain length and exposure to interruptions**

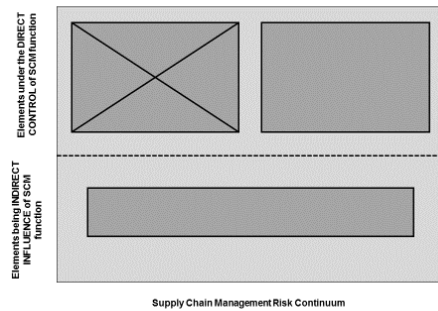
With the focus on global sourcing, supply lead times and variation in delivery reliability is sometimes sacrificed to achieve better global pricing.

Qualitative feedback received from respondents by way of their comments were as follows:

- Most donors are aware of local infrastructure challenges and will allow for such through No Cost Extensions.

The standard deviation in responses was 0.90 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.9 Supply chain performance management

Table 6.3.9 summarises the list of elements included under the key focus area of *Supply Chain Performance Management*. The ten elements will be discussed individually.

**Table 6.3.9: Elements included on the KFA of *Supply Chain Performance Management***

SUMMARY OF RESEARCH FINDINGS OF THE SUPPLY CHAIN PERFORMANCE MANAGEMENT KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY 3 = EFFECTIVE & EFFICIENT
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
9.1	Key performance indicators	1.0	2	2	2	1
9.1.1	High level key performance indicators	1.0	2	2	2	1
9.1.2	Balance Scorecard	1.1	1	2	2	3
9.2	Level of outsourcing	1.2	1	2	2	2
9.3	Contract Management	1.0	2	2	1	1
9.4	Cost Management	1.0	2	2	2	1
9.5	Process Optimisation	0.9	2	2	2	2
9.6	Improvement concepts	1.1	1	2	2	2
9.7	Change Management	1.0	1	2	1	2
9.8	Risk and Compliance Management	1.0	2	2	1	1

#### Element 9.1 - Key performance indicators

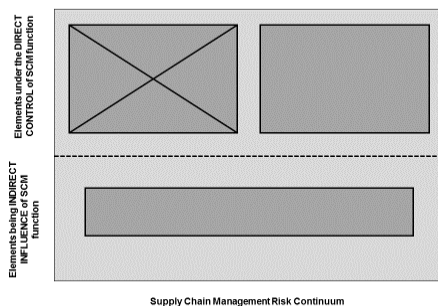
Using performance indicators across different levels of an organisation to measure and improve performance.

Qualitative feedback received from respondents by way of their comments were as follows:

- It is difficult to impact what you cannot measure. The right few KPIs are essential.
- Using a few key metrics is important rather than having 150 different ones, but not being used.

The standard deviation in responses was 0.96 indicating sufficient consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lag indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 9.1.1 - High level key performance indicators**

The 'Strategic Profit Model' is often used to measure 'RETURN ON ASSETS' as a key measure of success for Commercial SCM. Would 'CASH TO BENEFICIARY' be the key measure of success in Humanitarian SCM?

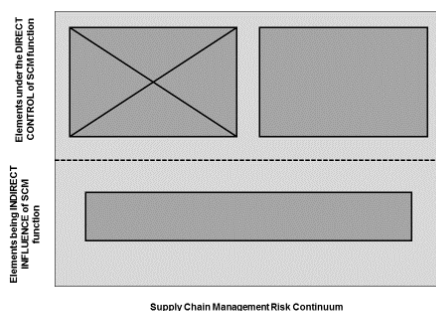
Qualitative feedback received from respondents by way of their comments were as follows:

- I like the 'Cash-to-Beneficiary' concept.
- Uncertain how this would work in humanitarian sector.
- Cash to beneficiary is important, but not only cash but the equivalent value of the goods or services. Sometimes the decision to air freight cost more than the value of the product.

- CASH TO BENEFICIARY means impact, effectiveness, cost ratio. The cash/beneficiary and the improvement of the well beings. As the measurement will influence the fund allocation to the sites.
- I am not sure I understand the cash to beneficiary metric, but availability & use of commodities by beneficiaries is important, but difficult to measure.
- Currently most NGOs are looking to judge impact based on changes in quality of life of beneficiaries. Cash arriving with beneficiaries would be a very crude measure. NGO leadership and donors are much more interested in positive social and economic and empowerment indicators as proof of return on investments whether assets or financial.

The standard deviation in responses was 1.03 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lag indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 9.1.2 - Balanced Scorecard**

The 'Balanced Scorecard' is often used to measure Financial, Customer, Internal processes and Learning and growth KPA's.

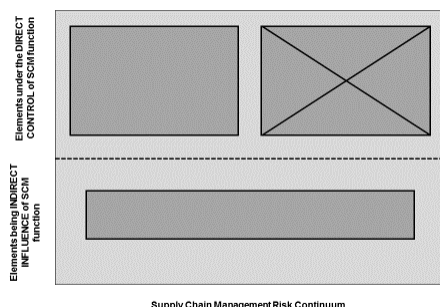


Qualitative feedback received from respondents by way of their comments were as follows:

- Method is irrelevant I would say - the content is more relevant.
- The main metric is "have you made The Minister or the DG happy?".
- Donors will appreciate this.
- It's important to see whether we are making progress on what we originally set out to achieve and whether we are or not.
- Balanced Scorecard is a nice to have, but is secondary to solid SCM KPIs.
- Was NOT sure on how it impacts, knowing that it is a big challenge to measure key Performance indicators (KPIs) for all due to changing variables i.e. changing environments.

The standard deviation in responses was 1.09 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of both effectiveness and efficiency, and
- a lag indicator.



Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions.

### **Element 9.2 - Level of outsourcing and collaborative alliances**

Implementing outsourcing as a mechanism to improve performance of the supply chain

Qualitative feedback received from respondents by way of their comments were as follows:

- Never outsource a problem - outsourcing therefore does not solve a problem (may only aggravate it)
- Organisations are moving away from outsourcing, due to an increasing awareness that you must pay the outsourcing partner their margins and profits
- SCM related outsourcing should be carefully considered and is difficult to justify in the humanitarian space.
- This is country dependent but should be encouraged if the right local partners are available to do this. However there are many areas that will never be commercially viable for private sector, so some public good support is required
- Most Donors are working with IMF and World Bank to influence procurement procedures in the Humanitarian sector through Government Authority Agencies that register NGOs, in view of increasing Competitiveness and transparency. Outsourcing is seen as a way of reducing costs and increasing visibility of spend.

This element had a high standard deviation of 1.16 following the second survey indicating a significant difference of opinion between the respondents. The grid position is in box 3 of the nine grid matrix (table 5.4.1). **However, the qualitative feedback received during the two rounds of empirical research confirmed that this element may not be adding value to the framework and will hence be excluded.**

### **Element 9.3 - Contract Management**

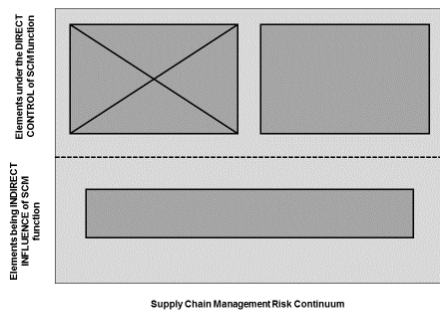
Managing contract compliance for all types of supplier contracts

Qualitative feedback received from respondents by way of their comments were as follows:

- Be more creative on contract types.
- Purchase Orders, framework agreements, construction contracts, or consultancy agreements are all critical to SCM execution, quality and supplier performance.
- An area that is becoming more important.

The standard deviation in responses was 1.03 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

#### **Element 9.4 - Cost Management**

Cost modelling of the supply chain to identify the high cost drivers and to reduce the overall cost of operations. This includes concepts such as activity based costing (ABC) and total cost of ownership (TCO).

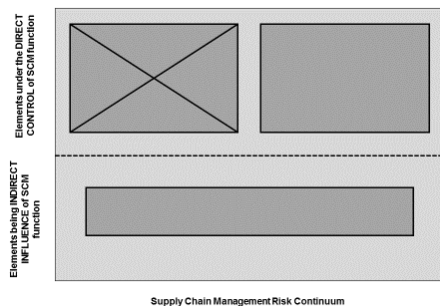
Qualitative feedback received from respondents by way of their comments were as follows:

- Very relevant. Might consider listing different cost elements such as transport, warehousing, inventory carrying, procurement and order management.

- I assume this does NOT include spend analysis which is very important.
- Another area that is becoming more important.

The standard deviation in responses was 0.95 indicating sufficient consensus between respondents. The grid position is in box one (1) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lag indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 9.5 - Process Optimisation**

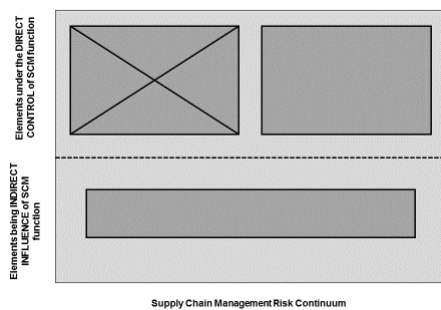
Improving the performance of supply chain processes through process improvement techniques.

Qualitative feedback received from respondents by way of their comments were as follows:

- This is very important for advancing SCM in the sector.
- Once the system is delivering, optimization can then be focused on, but not necessarily before.

The standard deviation in responses was 0.91 indicating sufficient consensus between respondents. The grid position is in box three (3) of the nine box grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of efficiency, and
- a lag indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### **Element 9.6 - Improvement concepts**

Improvements concepts such as JIT, LEAN to improve supply chain performance

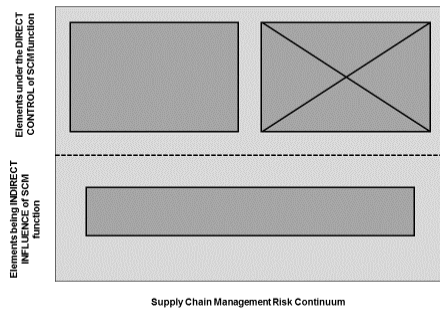
Qualitative feedback received from respondents by way of their comments were as follows:

- Very little manufacturing or production so these concepts are not as impactful (though suppliers should be applying them).

The standard deviation in responses was 1.07 indicating reasonable consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;

- having low impact on risk mitigation and can hence be used especially for more mature supply chain organisations;
- an indicator of both efficiency, and
- a lag indicator.



Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions.

### **Element 9.7 - Change Management**

Implementing transitions through change management interventions.

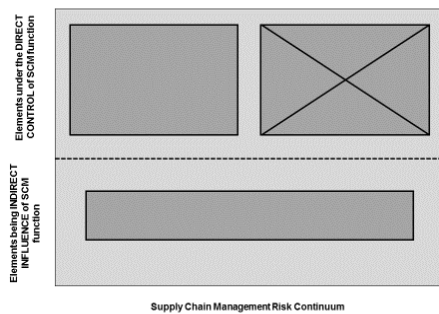
Qualitative feedback received from respondents by way of their comments were as follows:

- Not during the execution phase of the project.
- This is very important for any substantial change related to SCM.
- A mandate and funding is essential

The standard deviation in responses was 1.05 indicating reasonable consensus between respondents. The grid position is in box five (5) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used by especially for more mature supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.

Hence, the element will be included in the framework under direct control for



mature supply chain organisations focusing on value adding interventions as a strategic business partner.

### **Element 9.8 - Risk and Compliance Management**

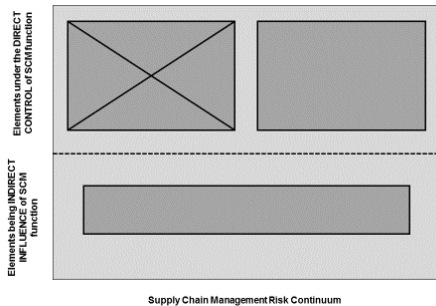
Managing supply chain risks and ensure compliance to risk procedures

Qualitative feedback received from respondents by way of their comments were as follows:

- Risks are important to identify sometimes you need to let the procedures go and get things done.
- Very important to UN, EU, etc.
- Essential.
- Critical both for donor confidence and for good governance.
- There are major SCM risks that must be monitored and managed collaboratively. Audit should be closely involved in assessing risks.

The standard deviation in responses was 0.97 indicating sufficient consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having high impact on risk mitigation and would hence be more relevant to developing supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for developing supply chain organisations focusing on risk mitigation.

### 6.3.10 Sustainable supply chain management

Table 6.3.10 summarises the list of elements included under the key focus area of *Sustainable Supply Chain Management*. The four elements will be discussed individually.

**Table 6.3.10: Elements included on the KFA of *Sustainable Supply Chain Management***

SUMMARY OF RESEARCH FINDINGS OF THE SUSTAINABLE SUPPLY CHAIN MANAGEMENT KEY FOCUS AREA						
		Grey shaded cells represents Std Dev greater than 1,1	1 = LOW 2 = HIGH	1 = INDIRECT 2 = DIRECT	1 = LEAD 2 = LAG	1 = EFFECTIVENESS 2 = EFFICIENCY
ELEMENT #	ELEMENT KEY WORD	STD Deviation	'Mode' of Risk Mitigation	'Mode' of Indirect or Direct	'Mode' of Lead or Lag	'Mode' of Effectiveness or Efficiency
10.1	Green SCM & triple bottom line accounting	1.2	1	1	2	1
10.2	Supply chain sustainability is ensured	1.0	1	1	1	2
10.3	Supplier development programs are implemented	1.0	1	2	1	1
10.4	Corporate and social responsibility programs are implemented	1.0	1	1	1	1

#### **Element 10.1 - Green supply chain management and triple bottom line accounting.**

Harmful economic, social and environmental impacts of supply chain operations to the environment is limited. The 'whole life basis' is considered when making SCM decisions. This includes biodiversity and disclosure of Carbon Emissions.

Qualitative feedback received from respondents by way of their comments were as follows:

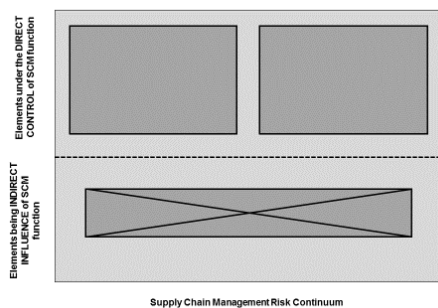
- “Green” is a hot topic but we understand way too little about it. As such it will not contribute to SCM goals but donors request it.
- Depending on the donor values. The type of donor and their values dictates this process



- This is something of key concern to enlightened donors and NGO leadership so I have rated it at the highest level.
- May or may not have impact or increase funding.
- Becoming more important in the new more modernised world.
- This area is not as important at the moment for many donors and will become more important in the future, though some donors do focus specifically in this area.

The standard deviation in responses was 1.19 indicating relatively low consensus between respondents following round two of the empirical research. The grid position is in box six (6) of the nine grid matrix (table 5.4.1). This element has been rated as:

- NOT being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used by mature supply chain organisations;
- an indicator of effectiveness, and
- a lag indicator.



Although the research results indicated a high standard deviation between responses, the qualitative comments supports the inclusion of the element in the framework. However, due to the relative low impact on risk mitigation, this element will be included under the framework to measure more

mature supply chain management organisations. Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations but will be included in the cross functional list of elements that needs to be coordinated between functions.

### **Element 10.2 - Supply chain sustainability is ensured**

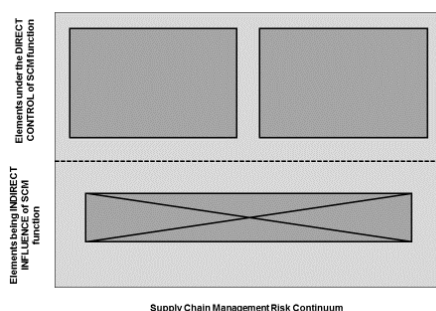
Ensure sustainability through using alternative resources (strategic sourcing and dual sourcing) to support the supply chain. SCM decisions are not made on economic factors alone.

Qualitative feedback received from respondents by way of their comments were as follows:

- Measured high financial performance is the key indicator of a sustainable SCM system!

The standard deviation in responses was 0.97 indicating sufficient consensus between respondents. The grid position is in box six (6) of the nine grid matrix (table 5.4.1). This element has been rated as:

- NOT being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used by mature supply chain organisations;
- an indicator of efficiency, and
- a lead indicator.



Due to the relative low impact on risk mitigation, this element will be included under the framework to measure more mature supply chain management organisations. Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations

but will be included in the cross functional list of elements that needs to be coordinated between functions.

### **Element 10.3 - Supplier development programs are implemented**

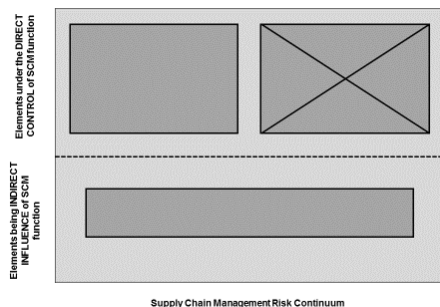
Engaging with small, medium, and micro enterprise (SMME) suppliers in developing economies to mainstream these into the formal sector. (BBBEE in South Africa and Frontier Market Development Internationally]

Qualitative feedback received from respondents by way of their comments were as follows:

- Need to focus on the primary goals / immediate needs.
- Because humanitarian work is typically in less developed contexts, suppliers likewise need modernization and development to better serve humanitarian clients.
- Small, medium, and micro enterprise (SMME) suppliers are part of the community. Engaging with them is increasing the propensity to develop the communities. Most agencies see the development of local market as an indirect contribution to the families. Increased GDP is of interest to most donors.
- Try to shape all these elements into a project to help businesses to organise how to improve themselves over time. Consider developing a phased approach.
- The development of Entrepreneurs has become a priority.

The standard deviation in responses was 1.00 indicating sufficient consensus between respondents. The grid position is in box three (3) of the nine grid matrix (table 5.4.1). This element has been rated as:

- being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used by mature supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Hence, the element will be included in the framework under direct control for mature supply chain organisations focusing on value adding interventions as a strategic business partner.

#### **Element 10.4 - Corporate and social responsibility programs are implemented**

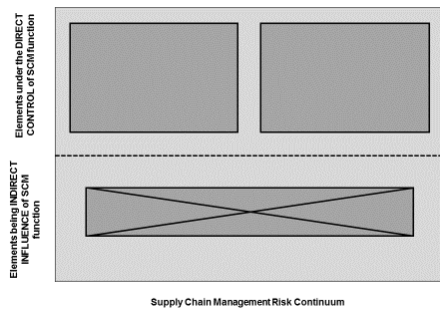
Human rights are respected. Fair labour practices are monitored and child labour is avoided. Working conditions of own organisation and those of SCM partners are uplifted.

Qualitative feedback received from respondents by way of their comments were as follows:

- From outset, must be understood by SCM team their capacity to do good in a country extends far beyond the operational programs. They have capacity to create opportunity, improve processes, introduce new technologies, re-create communities and transform lives, not to mention the impact on the organization's own staff and SCM Team!
- Our experience in Mongolia was salutary. The drivers were (1) the elimination of corrupt dealings; (2) re-focusing whole of staff time on to doing the jobs they were hired to do (not spending up to 60% of their time on SCM); (3) ensuring transparency of process; (4) building an efficiency based SCM process; (5) Save real dollars for re-investment in transforming lives; (6) take leadership of SCM efficiency in the Mongolian economy; (7) build a local team of SCM professionals; and build a new process from the bottom up involving all affected staff and management (including CEO).
- Super important NGOs are ensuring suppliers are not involved in human rights violations.

The standard deviation in responses was 1.01 indicating reasonable consensus between respondents. The grid position is in box one (1) of the nine grid matrix (table 5.4.1). This element has been rated as:

- NOT being under the direct control of the SCM function;
- having low impact on risk mitigation and can hence be used by mature supply chain organisations;
- an indicator of effectiveness, and
- a lead indicator.



Due to the relative low impact on risk mitigation, this element will be included under the framework to measure more mature supply chain management organisations. Hence, the element will not be included in the two frameworks under the direct control of supply chain organisations

but will be included in the cross functional list of elements that needs to be coordinated between functions.

### 6.3.11 Additional elements identified through the research

#### **Supplier Qualification**

A thorough bidding / procurement process that ensures suppliers track record: suppliers are financially capable of meeting their supply commitments within agreed lead times/do not overcommit, have compliant plants.

Qualitative feedback received from respondents by way of their input on shortcomings of the proposed elements to be included in the framework:

- Supplier selection and management: Anti-terrorism screening.
- Supplier selection and management: Supplier qualification.
- Strategic sourcing: Negotiation, spend analysis section – 7 steps as per sourcing processes.

This element was not empirically validated. It will therefore be recommended for validation during future research.

#### **Communication**

Such as reporting and ensuring alignment.

Qualitative feedback received from respondents by way of their input on shortcomings of the proposed elements to be included in the framework:

- Communication, analytical and personal relationship skills
- Maybe sufficiently important to justify separate mentioning
- The following key factors were critical to HSCM performance management during the process of tracking from requisition, procurement, logistics and vendor management perspective:
  - Automated report to highlight no of items with delayed delivery (Vendor Inefficiency)
  - Monthly report to Vendors highlighting where a delay in submission will result in late payment. (Procurement Inefficiency)
  - Vendor report highlighting “Payment due” or “Late Payment” or “On-time Payment” (Procurement Inefficiency and Vendor Management). Add column on payment terms and automated column or report telling which items have delayed payment.

This element was not empirically validated. It will therefore be recommended for validation during future research.

### **People Development:**

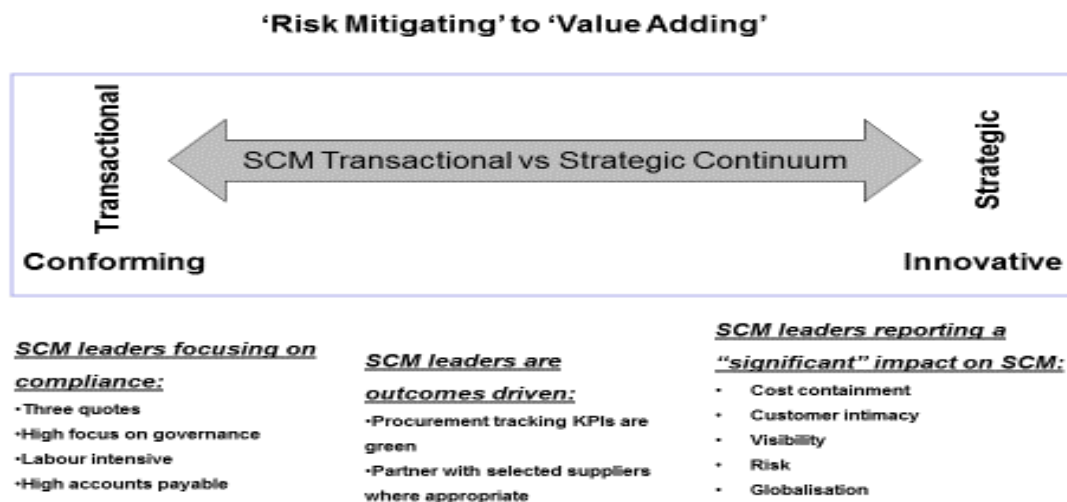
Communication, analytical, organisational dynamics and personal relationship skills. This element was not empirically validated. It will therefore be recommended for validation during future research.

### **6.3.12 Qualitative feedback on the supply chain maturity continuum**

Taking into consideration spend that is touched (spend both under direct control as well as spend influenced) by the supply chain management function within a not-for-profit humanitarian organisation, it becomes obvious that huge opportunity exists throughout the humanitarian supply chain to add value. Prior field research confirmed that spend influenced by supply chain management could vary from about 40% on development programmes up to 60% if relief operations are included and up to 80% of an NGO's budget if commodities such as food and gifts-in-kind are included. The level of spend is obviously contingent on the organisational mission, the supply chain management mandate and level of supply chain management sophistication.

During the field work and numerous interviews, it became apparant that not all humanitarian organisations were of the same level of maturity. It therefore follows logically that not all supply chain management organsations operate on the same level of maturity. It was discovered that supply chain organisations and humanitarian organisations themselves develop from a transactional – excecutional - risk avoiding and mitigating position to a more strategic, value adding position of strategic design and good corporate governace. The conforming SCM organisation, often times reporting into either the Audit or Finance functions, has not progressed beyond a purchasing organisation focusing on avoiding audit findings. The innovative SCM organisation is in a position where the Supply Chain Management Function is viewed as a respected and value adding business partner serving in the ‘C’suite of an organisation. See figure 6.4 for a depiction of the the shift in focus as organisations progress through the maturity continuum, initialilly striving to being compliant, progressing through being outcomes driven and ultimately becoming a respected value adding business partner.

**Figure 6.4: SCM maturity continuum**



Source: Developed by the author during field research for the purposes of this study

Those elements under direct control of the SCM function with a high propensity towards risk mitigation will be covered in section 7.3.1 and those with a lower propensity towards risk mitigation will be covered in section 7.3.2. Those elements not directly controlled will be covered in section 7.3.3.

## 6.4 Summary

**Three (3) of the 65 elements** were be excluded from the framework following the second survey. **A further three (3) of the remaining 62 elements** were eliminated based on the qualitative analysis of the respondent's feedback. These three elements are:

**Element 2.4 - Demand / Supply Balancing:** Based on the interpretation of the qualitative feedback and relative high level of disagreement between the respondents, **this element is eliminated** due to relatively high standard deviation and conflicting comments received from the respondents.

**Element 6.1 - Align supplier's manufacturing strategy with own desired logistics concept:** This element will be excluded from the framework due to the relative high levels of disagreement between the respondents during both rounds and based on the comments received by some respondents.

**Element 9.2 - Level of outsourcing and collaborative alliances:** This element had a high standard deviation of 1.16 following the second survey indicating a significant difference of opinion between the respondents. The grid position is in box 3 of the nine box grid matrix (table 5.4.1). However, the qualitative feedback received during the two rounds of empirical research confirmed that this element may not be adding value to the framework and will hence be excluded.

Therefore, starting with **65** SCM elements, **3** were eliminated following the second survey due to high disagreement between the respondents, and a



further **3** were eliminated based on expert opinion feedback from the respondents leaving **59** elements inclusion in the framework.

The 42 SCM elements under the direct control of the SCM function that have a high impact on risk mitigation will be further discussed in section 7.3.1.

The 8 SCM elements under the direct control of the SCM function that have a low impact on risk mitigation will be further discussed in section 7.3.2.

The 9 SCM elements rated as not being under the direct control of the SCM function will be discussed in section 7.3.3.

## **PART 4: CONCLUSION**

### **CHAPTER 7: SUMMARY AND CONCLUSIONS**

The purpose of this study is to develop a new framework to measure supply chain management efficacy in humanitarian supply environments. This chapter summarises the conclusions to this study of what framework can be used for humanitarian supply chain managers to measure their supply chain's efficacy. Supply chain "efficacy" includes effectiveness, efficiency, seamless integration between functions and business processes to continuously deliver the intended results.

The research findings confirmed that the framework is about a set of supply chain management elements that can be used to provide focus. However, not all SCM elements are equally applicable to all supply chains. Humanitarian supply chain practitioners need to differentiate between three frameworks in order to use the SCM elements most appropriate for their organisation. More details are described in section 7.3.

Supply chain management organisations differ in maturity pertaining to their skills, internal respect, their mandate and level of funding. Not all SCM elements are under the direct control of the supply chain management function either, hence the three progressive frameworks. Therefore, humanitarian supply chain managers need to assess and discern the level of organisational maturity in order to position themselves appropriately in the situation of the best opportunity to add value, balancing the needs and their ability.

The scope of this research delineated humanitarian "not-for-profit" supply chains from commercial "for-profit" supply chains. The research focused on slow on-set natural disasters and not emergency response logistics.

## 7.1 Introduction

The objective of this study is to identify which key focus areas and supply chain management elements ought to be included in a framework to measure supply chain management efficacy in humanitarian supply environments.

From first principles (as described in detail in chapter 3), one needs to measure value added in the eyes of the customer. The challenge in humanitarian supply chain management (HSCM) is to define and agree “who is the customer”. In hospitals, many patients would argue they are the customer. However, the Medical Doctor often times decides when a patient needs to be admitted to hospital, and in the case of surgical interventions, in which hospital will the procedure be done. Therefore, one can argue that the Medical Doctor is the customer in the hospital industry. In the retail industry, the high levels of information availability and transport mobility forces supply chains to be consumer driven. However, in HSCM, the “customer” is not that obvious. It is important to reflect in whose interest does HSCM act, or whose interest is protected. Often times the beneficiary has little choice in when and what the programme will entail, but the donors make some of these decisions. One can therefore postulate that the donor body is the primary customer of HSCM and not the beneficiaries.

Many aspects of the humanitarian supply chains are actually similar to the commercial supply chains. Manager’s views about the activities, process and management planning and integration are measured similarly in both supply chains. It is however necessary to reflect on the differences between Commercial SCM (CSCM) and Humanitarian SCM (HSCM) as discussed in detail in chapter 2. Comments received pertaining to the drivers of HSCM during the field research include:

*“Our experience in Country M in East Asia (Country name omitted respecting anonymity) was salutary. The drivers were (i) the elimination of corrupt dealings; (ii) re-focusing of staff time on to doing the jobs they were hired to do (not spending enough time on SCM); (iii) ensuring transparency of process; (iv) building an efficiency based SCM process; (v) save real dollars for re-investment in transforming lives; (vi) take leadership of SCM efficiency into the local national economy; (vii) build a local team of SCM professionals; and (ix) build a new process from the bottom up involving all affected staff and management.”*

From the above comment and general feedback received from the respondents, one can conclude that although the business processes between HSCM and CSCM are the same, the expected outcomes differ in that return on investment is less important and humanitarian development enjoys higher emphasis. One would not hear a CSCM leader stating the above nine outcomes as defining success.

The research leads to the conclusion that there is a lot of hope for the HSCM to improve efficacy. The challenge is to do introspection and self-assessment as to where each organisation is with regards to their level of maturity and to select the most appropriate framework to measure themselves commensurate with their level of maturity. Hence the need for a start-up or immature HSCM with a weak mandate and limited funding to start with framework one, and migrate towards frameworks two and three as they mature.

## **7.2 Research objectives**

### **7.2.1 Primary research objective**

The primary purpose of this study is to develop a new framework (what) for humanitarian supply chain managers (whom) to measure a supply chain's efficacy. Supply chain "efficacy" includes effectiveness, efficiency, seamless

integration between functions and business processes to continuously deliver the intended results (why).

The scope of the research will cover humanitarian supply chain management in developing economies (where). The scope of this research excluded emergency response logistics.

### **7.2.2 Secondary research objective**

The secondary research objective is to empirically test which supply chain management elements could be grouped into key focus areas?

### **7.2.3 Research question**

The primary research question is: “What instrument(s) or framework can measure supply chain efficacy in humanitarian supply environments in the most effective way?”

### **7.2.4 Research methodology**

The overall objective of this research is to study what instrument(s) can measure supply chain efficacy in the most effective way. This study combined quantitative and qualitative methods. According to Mangan, Lalwani and Gardner (2004), better insights in the field of logistics research can be obtained if one combines quantitative and qualitative methods.

Interviews were held with 25 humanitarian supply chain managers, from across the world. These interviews are viewed as the first round of qualitative research. The purpose of these interviews was to gain insight into aspects of

preparedness for sudden on-set natural disasters such as hurricanes for example or slow on-set disasters such as droughts. Sixty five (65) supply chain management elements were identified and grouped into ten (10) key focus areas, applicable to specific functions within a humanitarian supply chain. The result from this first phase of research was used as input into the research questionnaire.

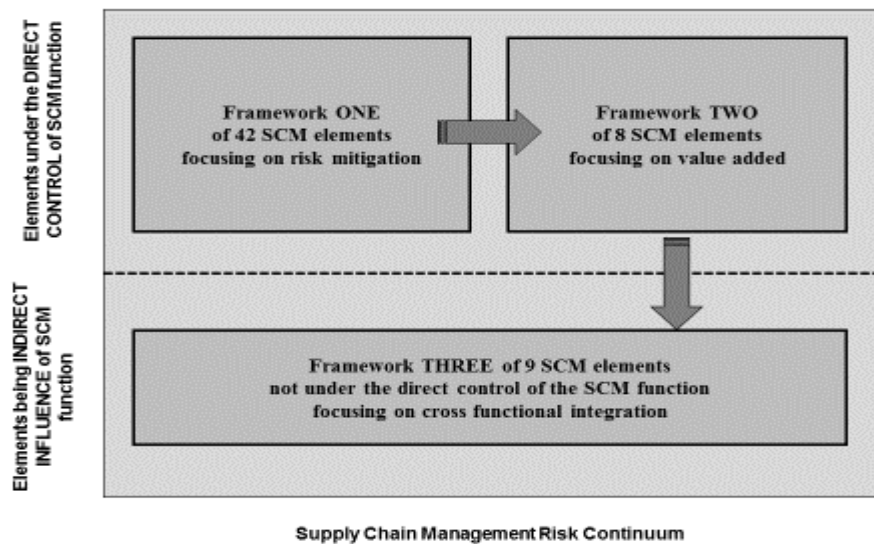
This newly developed framework of elements was empirically tested during two rounds of qualitative research. Of 65 elements evaluated during the first round of qualitative research and evaluation, 22 elements were identified as having a high standard deviation indicating a significant difference in rating between the respondents. Another round of empirical testing was done on these 22 elements applying the consensus seeking principles of the Delphi technique. A cut off time after one year was imposed between the start of the first round and completion of the second round of empirical research. It was necessary to impose a cut off time for the second round due to the long time it took for each research associate to reflect and respond. Although the number of elements being evaluated reduced from 65 in round one to 22 in round two, some of the research associates were slow to respond during the second round. Although the number of respondents reduced, it was viewed that sufficient consensus was reached.

A process of elimination and grouping was followed as described in chapter 6 and three frameworks were developed.

### **7.3 Elements included in the three frameworks**

It is important to note that these three frameworks are progressive in nature. It follows that an organisation cannot start by implementing cross functional integration of supply chain management elements if they do not have the risk mitigation processes of framework one, for example, in place. Refer figure 7.1.

**Figure 7.1: Progressive nature of the three HSCM efficacy frameworks**



Source: Developed by the author during field research for this study

**The first framework** contains elements under the direct control of the supply chain management function where the respondents rated these elements as having a high propensity towards risk mitigation. These elements would be most appropriate to be used for developing organisations that focus on risk avoidance, reducing audit findings, and seeking compliance to corporate governance. This framework contains **42** SCM elements. (See section 7.3.1 for details)

**A second framework** was developed containing SCM elements also under the direct control of the SCM function where respondents rated these elements as having a lower propensity towards risk mitigation. These elements would be most suitable for supply chain management organisations focusing more on value adding interventions. This framework contains **8** SCM elements and would be appropriate for more mature organisations whose supply chain management function is viewed as strategic partner by the C-suite of such an organisation. (See section 7.3.2 for details)

Table 7.1: HSCM efficacy frameworks ONE and TWO

FIRST FRAMEWORK TO MEASURE SUPPLY CHAIN EFFICACY					
ELEMENTS FOR SUPPLY CHAIN MANAGEMENT FUNCTIONS WHO FOCUS ON RISK MITIGATION					
ELEMENT #	ELEMENT KEYWORD	LEAD	LAG	EFFECTIVENESS	EFFICIENCY
1.1	Ethical standards & policies	●		●	
1.2	The SCM strategy formulated & documented	●		●	
1.3	Channel differentiation	●		●	
1.4	Demand Management Strategy	●			●
1.5	Demand fulfilment strategy	●			●
1.6	Procurement Strategy	●		●	
1.9	Product Portfolio Rationalisation	●			●
1.10	Globalisation	●			●
2.2	Demand Planning	●		●	
2.3	Supply Planning	●		●	●
2.5	Operations Scheduling	●			●
3.1.1	Global Supply Chain Integration	●			●
3.1.2	Developing global logistics strategies	●			●
3.1.3	Multi-Modal Solutions	●			●
3.1.4	Transport Operational Management	●		●	
3.2.2	Clearing	●			●
3.2.3	Forwarding	●			●
3.2.4	Incoterms	●		●	
3.2.6	Disbursements	●		●	
3.3.1	Facility location	●			●
3.3.2	Facility Design & Layout	●			●
3.3.3	Facilities Operational Management	●			●
3.3.4	Inventory control	●			●
3.3.5	Materials Handling	●			●
4.1	Donor Relationship Management	●		●	
4.2	Order Management	●		●	
5.1	Purchasing planning	●		●	●
5.2	Requisition process	●		●	
5.3	Purchasing Execution	●			●
6.3	Execution Management	●		●	
7.1	Systems & Technology Implementation	●			●
7.2	Systems & Technology Risks	●			●
8.1	Demand stability vs. volatility	●			●
8.2	Supplier performance and reliability	●			●
8.3	Economic climate of supply market	●			●
8.5	Long Shipping line vs. sourcing locally	●			●
9.1	Key performance indicators		●	●	
9.1.1	High level key performance indicators		●	●	
9.3	Contract Management	●		●	
9.4	Cost Management		●	●	
9.5	Process Optimisation		●		●
9.8	Risk and Compliance Management	●		●	
SECOND FRAMEWORK TO MEASURE SUPPLY CHAIN EFFICACY					
ELEMENTS FOR SUPPLY CHAIN ELEMENTS WHO FOCUS ON VALUE ADDING					
ELEMENT #	ELEMENT KEYWORD	LEAD	LAG	EFFECTIVENESS	EFFICIENCY
1.7	Product Development	●		●	
1.8	Portfolio Management of service offerings	●			●
2.1	Demand / Need Sensing	●		●	
3.1.7	Fleet Management	●			●
9.1.2	Balance Scorecard		●	●	●
9.6	Improvement concepts		●		●
9.7	Change Management	●			●
10.3	Supplier development programs are implemented	●		●	

SOURCE: DEVELOPED BY THE AUTHOR FOR THE PURPOSES OF THIS THESIS



A **third framework** was developed containing SCM Elements that are not under the direct control of the SCM function, but are essential to good SCM efficacy and can henceforth be used as integrating themes or skewers to drive cross functional integration. This framework contains **9** elements which can only be influenced by the SCM Function (See section 7.3.3 for details).

**Table 7.2: HSCM efficacy framework THREE**

NOT UNDER THE DIRECT CONTROL OF  
THE SUPPLY CHAIN MANAGEMENT FUNCTION

THIRD FRAMEWORK TO MEASURE SUPPLY CHAIN EFFICACY					
CROSS FUNCTIONAL INTEGRATION ELEMENTS NOT UNDER THE DIRECT CONTROL OF SUPPLY CHAIN MANAGEMENT					
ELEMENT #	ELEMENT KEYWORD	LEAD	LAG	EFFECTIVENESS	EFFICIENCY
2.6	Financial Appraisal	●		●	
3.2.1	International Trade	●		●	
3.2.5	Invoicing and Terms	●		●	
3.2.7	Foreign Currency & Foreign Exchange management		●		●
5.4	Accounts payable process		●		●
8.4	Labour climate in the country and origin	●		●	
10.1	Green SCM & triple bottom line accounting		●	●	
10.2	Supply chain sustainability is ensured	●			●
10.4	Corporate and social responsibility programs are implemented	●		●	

SOURCE: DEVELOPED BY THE AUTHOR FOR THE PURPOSES OF THIS THESIS

## 7.4 The use of Lead and Lag indicators

A dominant trend emerged towards elements having a higher propensity towards lead indicators. **Fifty-five (55)** or 84% of the **sixty-five (65)** elements were rated as lead indicators. This is a positive result in that organisations can use these lead indicators to proactively influence and manage their business outcomes.

## 7.5 The value of Effectiveness vs. Efficiency

Although no dominant trend emerged between effectiveness and efficiency. However, with 60% of the SCM elements rated as contributing more towards effectiveness, it can be postulated that effectiveness should receive a higher priority than efficiency. The justification being that one does not want to do

anything cost effectively if it should not have been done at all. Therefore, elements measuring effectiveness will be rated as a higher priority in the framework.

By way of example, the researcher compiled the following list of potential benefits of improved effectiveness and improved efficiency of process automation:

- Improved effectiveness;
  - better planning and visibility of these plans e.g. annual business plan, detailed implementation planning, buying plans and budgets;
  - enhanced execution and programme / project management;
  - more accurate purchase requests;
  - online approval of purchase orders (for example) with built-in approval limits;
  - visibility of budgets and encumbrances leading to a reduction in over and underspending;
  - improved collaboration between business units within the organisation and SCM units;
  - ease of access and sharing of information; and
  - no loss of records
- Improved efficiency;
  - reduction of manual data entry and recapturing of data;
  - accuracy of data entry;
  - ease of accessing historical data for analyses and system generated reporting and reports;
  - electronic alerts pressurising managers to be responsive in approving actions;
  - shortening approval processes; and
  - time savings

- Enhanced donor confidence;
  - enhanced governance;
  - embedded supply chain business processes which reduces the ability of circumventing the processes;
  - improving controls and accountability;
  - greater discipline and adherence to business processes ensuring better compliance and fewer audit findings;
  - data base for system of record and for archiving data and audit trails of procurement process (prices, bids, quotes); and
  - improved budget monitoring

## 7.6 Limitations of this study

This study focused on the framework that could measure supply chain management efficacy in humanitarian supply environments. However, there is still a need for more research on objective setting in humanitarian supply environments.

The **10** key focus areas identified during the first round of qualitative field research may not be the complete set of key focus areas for supply chain management organisations. More research is required to empirically test the impact of supply chain management at different levels of organisations as well as for different levels of supply chain management maturity. Using a factor analysis may have yielded a different view of themes than what are presented in this study.

The **65** SCM elements may not be complete set of elements. More elements may be required although the respondents recommend three more which were not empirically tested. These three are:

## **KFA 5 Supply execution (Plan to Procure to Pay)**

### **1. Potential Additional Element: Supplier Qualification**

A thorough bidding / procurement process that ensures suppliers track record: suppliers are financially capable of meeting their supply commitments within agreed lead times/do not overcommit, have compliant plants.

## **KFA 7 Supply Chain Visibility**

### **2. Potential Additional element: Communication**

Process of tracking from requisition, procurement, logistics and vendor management perspective:

- a. Automated report to highlight no of items with delayed delivery (Vendor Inefficiency)
- b. Monthly report to Vendors highlighting where a delay in submission will result in late payment. (Procurement Inefficiency)
- c. Vendor report highlighting "Payment due" or "Late Payment" or "On-time Payment" (Procurement Inefficiency and Vendor Management). Add column on payment terms and automated column or report telling which items have delayed payment.

## **KFA 8 Internal processes and risk management**

### **3. Potential Additional Element: People development**

Communication, analytical, organisational dynamics and personal relationship skills

## **7.7 Future research recommendations**

Researching and developing key performance metrics and benchmark performance standards may be of some value, but the actual benchmark levels may vary too much between organisations and may not be value adding. However, in order to quantify KPIs, one first needs to have a framework which is the purpose of this thesis. KPIs are organisationally specific but the framework to measure supply chain management efficacy can be applied generically across all organisations, and will be customised appropriately according to an organisation's supply chain management maturity.

Future research that could add great value would a diagnostic management tool that could 'gauge the state or condition' of a humanitarian organisation's supply chain and offer commensurate solutions to facilitate not only continuous but also focused step change improvement interventions.

## PART 5: APPENDICES

### A - REFERENCE LIST

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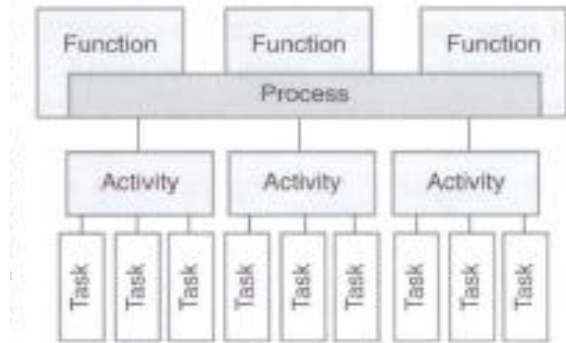
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## B - GLOSSARY OF TERMINOLOGY.

### Activity

A collection of tasks that have a common purpose, produce a common output, or address a common theme.



### Eco Systems

An ecosystem is a biological system consisting of all the living organisms or biotic components in a particular area and the non-living or abiotic components with which the organisms interact, such as air, mineral soil, water, and sunlight.[1] Key processes in ecosystems include the capture of light energy and carbon through photosynthesis, the transfer of carbon and energy through food webs, and the release of nutrients and carbon through decomposition. Biodiversity affects ecosystem functioning, as do the processes of disturbance and succession. Ecosystems provide a variety of goods and services upon which people depend; the principles of ecosystem management suggest that rather than managing individual species, natural resources should be managed at the level of the ecosystem itself.

<http://en.wikipedia.org/wiki/Ecosystem>

### Effectiveness

Effectiveness is the extent to which an activity fulfils its intended purpose or function.

<http://www.qualityresearchinternational.com/glossary/effectiveness.htm>

### Efficacy

Power or capacity to successfully produce a desired effect or intended result.

<http://www.thefreedictionary.com/efficacy>

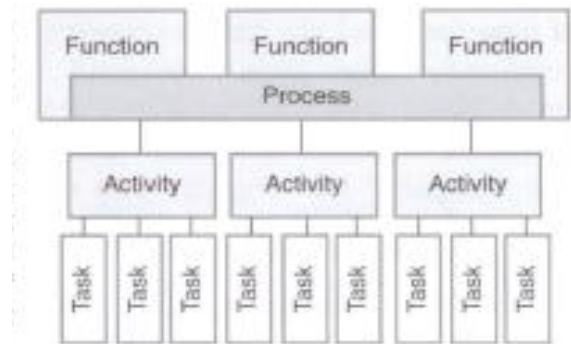
## Efficiency

Efficiency is the extent to which an activity achieves its goal whilst minimising resource usage.

<http://www.qualityresearchinternational.com/glossary/effectiveness.htm>

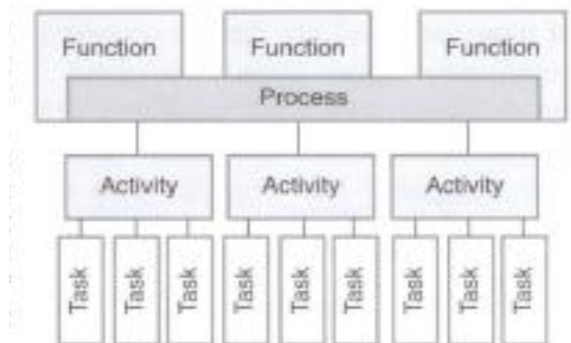
## Function

A grouping of related activities contributing to a combined result where trade-offs between the tasks and activities can be made under unified management



## Integration (as applied to Process)

The uniting, combining or incorporation of two or more functions within a company, or two or more processes between two or more companies into a compatible or unified process. This presupposes that joint definitions and agreements concerning the separate functions and processes have been defined and articulated between all parties.



## Key Performance Area (KPA)

The specific areas of operation which the organisation wishes to categorise its desired achievements. Focus areas are those specific operational sub areas.

[www.dsr.nsw.gov.au/ryc\\_plan\\_terms.asp](http://www.dsr.nsw.gov.au/ryc_plan_terms.asp)

### **Key Performance Indicator (KPI)**

A set of measures that help a company determine if it is reaching its performance and operational goals. Indicators can be both financial and non-financial, and there is no one set of indicators used by all companies.

[http://www.investorwords.com/6554/key\\_performance\\_indicators.html](http://www.investorwords.com/6554/key_performance_indicators.html)

### **Global Hunger Index (GHI)**

The Global Hunger Index (GHI) is a tool designed to comprehensively measure and track hunger globally and by region and by country. Calculated each year by the International Food Policy Research Institute (IFRPI), the GHI highlights successes and failures in hunger reduction and provides insights into drivers of hunger. To reflect the multidimensional nature of hunger, the GHI combines three equally weighted indicators into one index:

1 Undernourishment: the proportion of undernourished people as a percentage of the population (reflecting the share of the population with insufficient caloric intake)

2 Child underweight: the proportion of children under the age of five who are underweight (that is, have low weight for their age, reflecting wasting, stunted growth, or both), which is one indicator of child under nutrition)

3 Child mortality: the mortality of children younger than the age of five (partially reflecting the fatal synergy of inadequate caloric intake and unhealthy environments)

### **Logistics Management Definition**

“Logistics management is that part of supply chain management process that plans, implements, and controls the efficient, effective forward and reverse flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.”

### **Logistics Management Boundaries and Relationships**

“Logistics management activities typically include inbound and outbound transportation management, fleet management, warehousing, materials handling, order fulfilment, logistics network design, inventory control, and management of third party logistics services providers. It is involved in all levels of planning and execution--strategic, operational and tactical.”

[http://www.cscmp.org/about-us/supply chain management definitions](http://www.cscmp.org/about-us/supply-chain-management-definitions)

### **Metrics**

Metrics are a set of measurements that quantify results. Performance metrics quantify the unit's performance. Project metrics tell you whether the project is meeting its goals. Business metrics define the business' progress in measurable terms.

<http://management.about.com/cs/generalmanagement/g/metrics.htm>

### **Performance Management**

The process of motivating employees through setting goals, measuring progress, giving feedback, coaching for improved performance and rewarding achievements.

<http://www.toolingu.com/definition-950130-54686-performance-management.html>

### **Performance agreements**

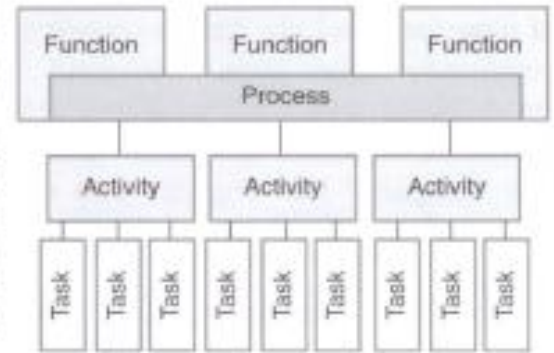
A performance agreement is a method of establishing expectations, accountability and consequences for not meeting a set standard of execution excellence. Two or more parties agree on the actions the performer will execute and agree on the expected results from executing those actions. Oftentimes, there are consequences if the performer doesn't deliver as agreed.

[http://www.ehow.com/about\\_6523444\\_definition-performance-agreement.html](http://www.ehow.com/about_6523444_definition-performance-agreement.html)



## Process

A series of linked, continuous and managed tasks and activities that contribute to an overall desired outcome or result. Processes have a specific starting point and ending point and often but not always, cross functional boundaries. Customers of the process are always at the end point of the process, and they are also often at its starting point.



## Supply Chain

A set of three or more organizations directly linked by one or more of the upstream and downstream flows of products, services, finances and information from a source to a customer. (Supply Chain Research Group, University of Tennessee, 1999)

## Supply Chain Management definition

*“Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies.”*

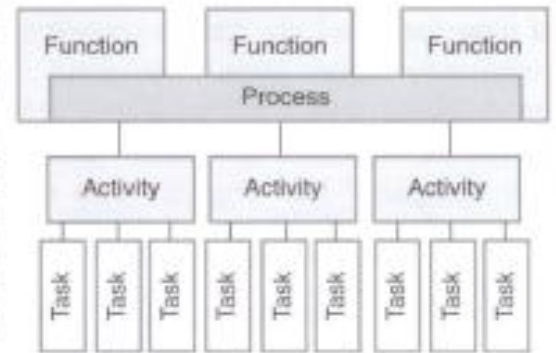
## Supply Chain Management Boundaries and Relationships

“Supply chain management is an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high-performing business model. It includes all of the logistics management activities noted in the definition, as well as manufacturing operations, and it drives coordination of processes and activities

with and across marketing, sales, product design, finance, and information technology.”

### **Task**

A coherent piece of work that can be assigned to an individual or small team and completed in a reasonably short amount of time.

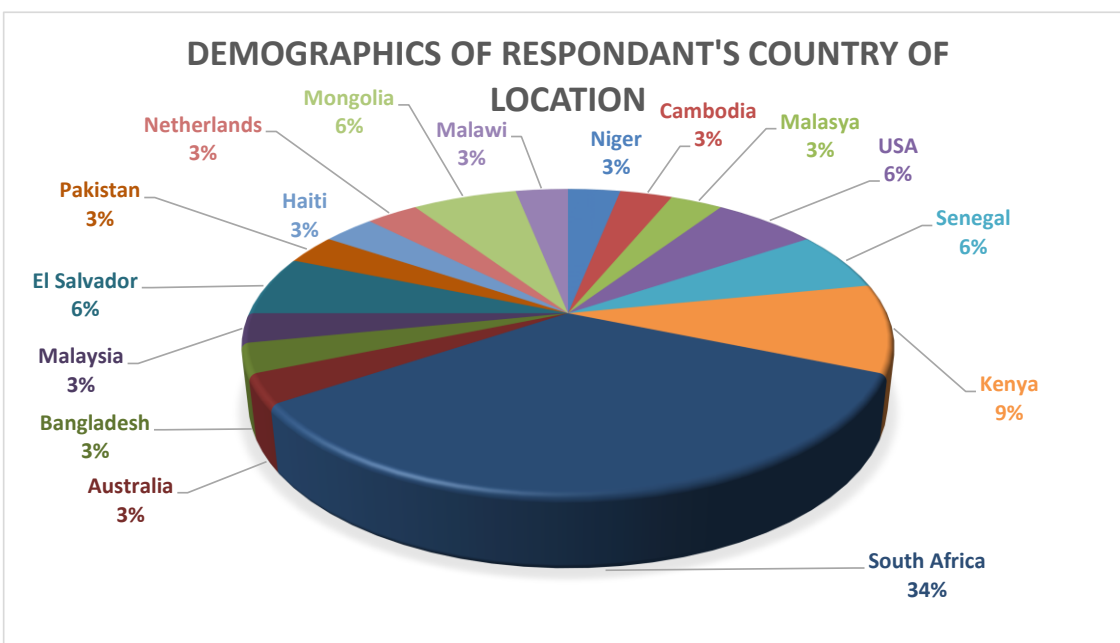


**C - ABBREVIATIONS**

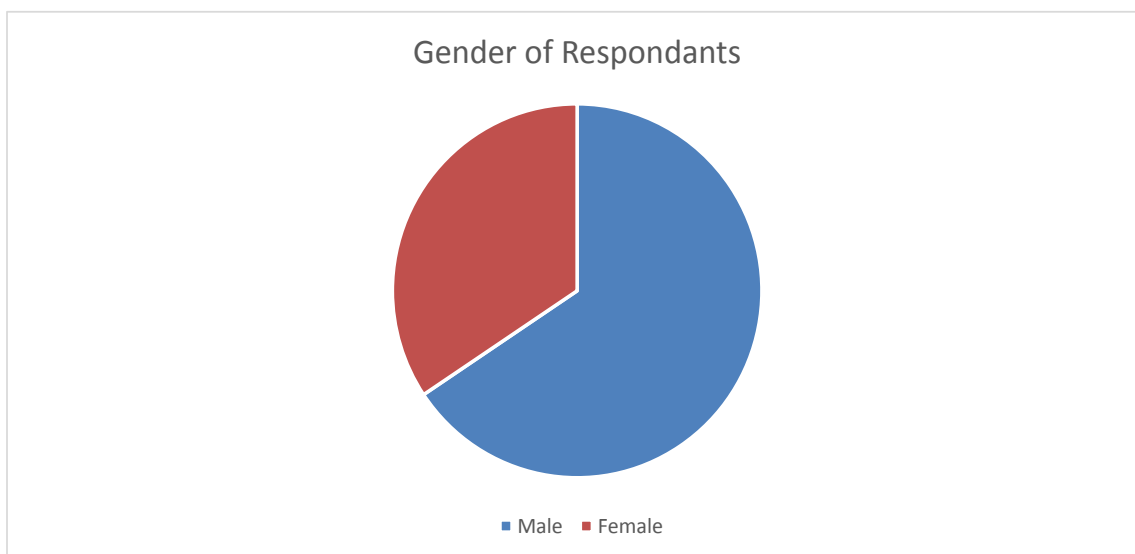
<b>BP</b>	<b>Business Process</b>
<b>GHI</b>	<b>Global Hunger Index</b>
<b>CSCM</b>	<b>Commercial Supply Chain Management</b> (Synonymous with Business Supply Chain Management)
<b>CLM</b>	<b>Council for Logistics Management</b>
<b>HSCM</b>	<b>Humanitarian Supply Chain Management</b>
<b>IFRC</b>	<b>International Red Cross and Red Crescent Societies</b>
<b>KPA</b>	<b>Key Performance Area</b>
<b>KPI</b>	<b>Key Performance Indicator</b>
<b>NCPDM</b>	<b>National Council of Physical Distribution Management</b>
<b>OCHA</b>	<b>United Nations Office for the Coordination of Humanitarian Affairs</b>
<b>SCM</b>	<b>Supply Chain Management</b>
<b>SWC</b>	<b>Soccer World Cup</b>

## D – DEMOGRAPHICS OF RESEARCH PARTNERS

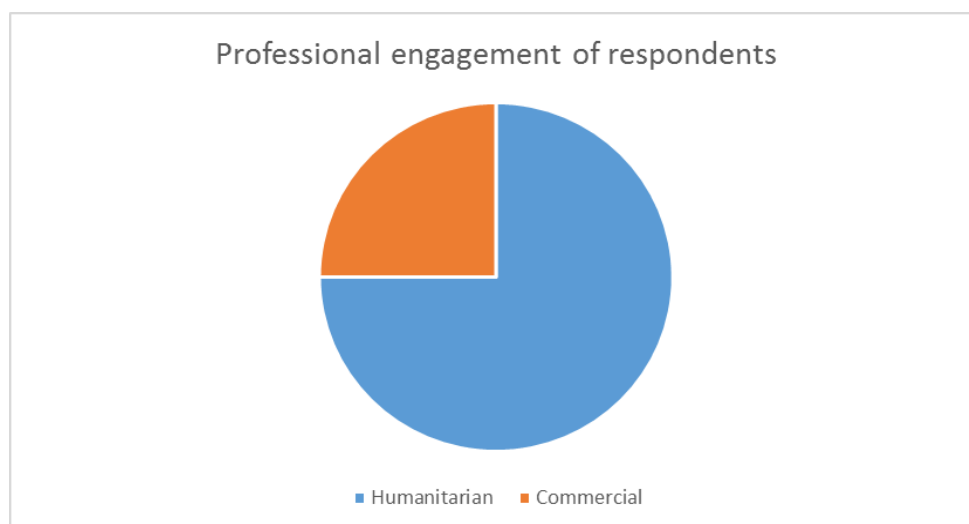
Thirty two (32) respondents participated during the first round and twenty one (21) of the thirty two during the second round. These respondents are not geographically located in the same region or country. See demographical depiction of the countries where these respondents were based at the time of completion of the surveys.



Sixty-five percent (65%) of the respondents are males.



Seventy-five percent (75%) of the respondents were deployed in humanitarian roles



Respondent confidentiality and anonymity was guaranteed throughout the research and individual names and representing organisations will not be revealed.

## **E – RESEARCH QUESTIONNAIRES**

See embedded documents and attachments for copies of the primary and secondary research questionnaires.

**First round empirical survey questionnaire**

**Second round empirical survey questionnaire**