

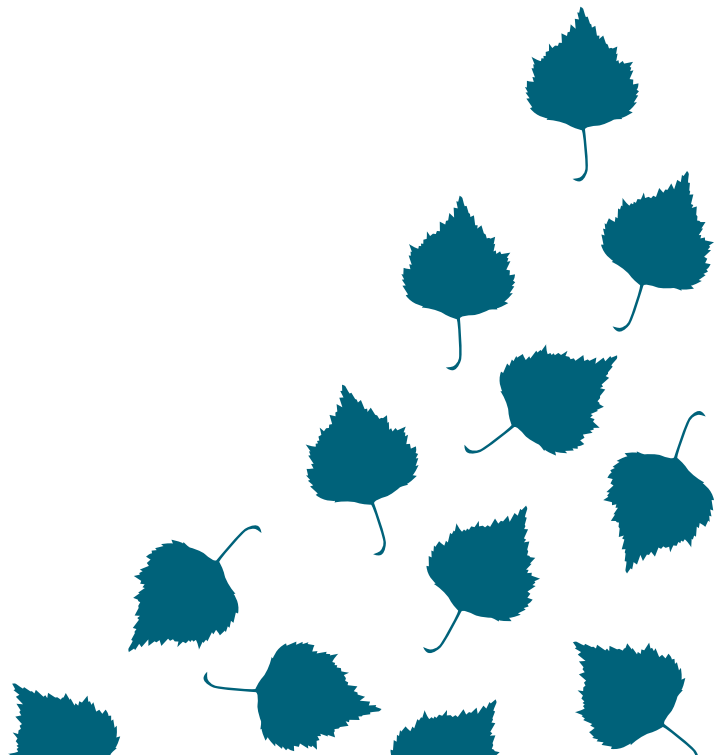
EKONOMI OCH SAMHÄLLE
ECONOMICS AND SOCIETY



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PERFORMANCE IN HUMANITARIAN SUPPLY CHAINS

IRA HAAVISTO



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Definitions of key concepts

Development aid is assistance given to developing countries to support their economic, social, and political development. Such assistance usually comes from individual countries or from international organizations. Development aid tends to be aimed at long-term problems such as poverty. (OECD, 2013)

Disaster impact, as defined in the *EM-DAT emergency events database*, is measured in terms of the number of people killed or affected or the economic damage caused by a disaster (EM-DAT, 2009).

Emergency relief is the immediate survival assistance to the victims of disasters crisis and violent conflict. Most relief operations are initiated on short notice and have a short implementation period (project objectives are generally completed within a year). The main purpose of emergency relief is to save lives. (OECD, 2013)

Humanitarian aid is assistance designed to save lives, alleviate suffering and maintain and protect human dignity. To be classified as humanitarian, aid should be consistent with the humanitarian principles of humanity, impartiality, neutrality and independence. Humanitarian aid includes: disaster prevention and preparedness; the provision of shelter, food, water and sanitation, health services and other items of assistance for the benefit of affected people and to facilitate the return to normal lives and livelihoods; measures to promote and protect the safety, welfare and dignity of civilians. Humanitarian aid thus includes emergency relief and can also include long-term program aid in a humanitarian setting. (OECD, 2013)

Humanitarian supply chain management encompasses the planning and management of all activities in sourcing and procurement, conversion, and logistics management. It also essentially includes coordination and collaboration with actors, who can be suppliers, intermediaries, third-party service providers, donors, implementing partners, and beneficiaries. In essence, humanitarian supply chain management integrates supply management and needs assessment within and across humanitarian organizations and other actors (Council of Supply Chain Management Professionals [CSCMP], 2011).

Impact is primarily understood throughout the thesis as the impact of humanitarian activity; thus, it not only brings about positive change to society and individuals but can also be related to averting negative change. The impact of humanitarian activity can be divided into institutional and individual beneficiary levels; the former can also cascade to increased welfare at an individual level (Hofmann, 2004; Leeuw and Vaessen, 2009).

Performance management facilitates the creation of an organization's strategic goals and supports the management of performance toward those goals through performance measurement and other activities and tools. It can be defined as a series of organizational processes and applications designed to execute organizational strategy (Ariyachandra and Frolick, 2008).

Performance measurement is the process of collecting, analyzing, and/or reporting information regarding the performance of an individual, group, or organization, or the process by which an organization manages its performance. Performance measurement is mainly perceived as a set of metrics used to quantify the performance and as the reporting process that gives feedback on the outcome of the actions. In this thesis,

performance measurement can encompass both quantitative and qualitative measurements and presentations of the performance (Franco-Santos et al., 2007).

Supply chain processes can be defined as a sequence with at least two activities, functions and operations or steps. A humanitarian supply chain process can include planning, procurement, transportation, customs clearance, warehousing, track and trace, coordination, local transport, last-mile delivery, and distribution (Blecken et al., 2009).

Supply chain strategy can be defined as “*the set of guiding principles, driving forces and ingrained attitudes that help to communicate goals, plans and policies to all employees that are reinforced through conscious and subconscious behavior at all levels of the supply chain*” (Harrison and van Hoek, 2002, p. 103).

List of used acronyms

ALNAP	Active Learning Networks for Accountability and Performance in Humanitarian Action
CSCMP	Council of Supply Chain Management Professionals
EM-DAT	Emergency events database
EPC	Event driven processes
ERP	Enterprise resource planning
GSC	Global supply chain (at IRC)
HLA	Humanitarian Logistics Association
HO	Humanitarian organization
HQ	Headquarters
ICRC	International Committee of the Red Cross,
IRC	International Rescue Committee
LPI	Logistics performance indicator
LRRD	Linking Relief Rehabilitation and development
M&E	Monitoring and Evaluation
MDG	Millennium Development goals
MFA	The Ministry for Foreign Affairs of Finland
NGO	Non-governmental organization
OM	Operations management
RQ	Research question
SC	Supply chain
SCM	Supply chain management
UN	United Nations
UN OCHA	United Nations Office for the Coordination of Humanitarian Affairs
UNDP	United Nations Development Programme
UNOPS	United Nations United Nations Office for Project Services
USAID	U.S. Agency for International Development
WB LPI	World Bank Logistics Performance index
SPHERES	Spheres project

1 HUMANITARIAN PERFORMANCE

The guiding beliefs in humanitarian operations are that “those affected by disaster or conflict have a right to life with dignity and, therefore, a right to assistance; and second, that all possible steps should be taken to alleviate human suffering” (Sphere Project, 2011). Furthermore, the goal of humanitarian organizations is to save lives (Beamon, 2004; Kovács and Spens, 2007), decrease human suffering (International Committee of the Red Cross [ICRC], 2010), and contribute to development (United Nations Development Programme [UNDP], 2013). In spite of this benevolent mission, the humanitarian response has been criticized for its lack of positive impact on societies receiving aid and more precisely, for the lack of aid effectiveness (Burnside and Dollar, 2000; Rajan and Subramanian, 2008; Moyo, 2009). At the core of the aid effectiveness discussion, researchers have found that humanitarian actions often operate under short-term goals, which can potentially lead to unintended, negative long-term effects on societies. For instance, a negative impact can be seen in the form of market distortion and aid dependency (Moyo, 2009), in harming the natural environment, or even prolonging conflict (Anderson, 1999). Operating under the assumption that people who are suffering need help, while still realizing that humanitarian actions might lead to unintended, long-term adverse outcomes, the humanitarian community follows the concept of “do no harm,” with the idea that all operations, however short, should consider the long-term aid impact. Anderson (1999) extended this idea of “do no harm” to acknowledge that the manner of aid delivery and the operations behind it are instrumental in supporting or hindering larger societal developments.

A humanitarian action’s longevity is reviewed by several major donors (e.g. the US Agency for International Development [USAID] and the European Community Humanitarian Office) as a requirement of first, a structured reflection on an action’s expected impact when an organization requests funds and second, a rigorous monitoring and evaluation (M&E) process throughout a program’s activity cycle. In addition to these requests for considering long-term goals, such as the millennium development goals (MDGs) and the aim to “do no harm,” donors also require humanitarian operations to be efficient and transparent (Burderlein and Dakkak, 2010).

The aid effectiveness discussion has seemingly been incorporated at the operational level as an increased focus on cost and time efficiency; on the other hand, it is criticized, since this can lead to overlooking other considerations, such as equity (Balcik et al., 2010) and sustainability (Haavisto and Kovács, 2012). However, efficiency should not be disregarded, since humanitarian organizations are also required to demonstrate efficient operations from the beneficiary side, especially when a rapid-onset disaster occurs, since operational efficiency can be vital and lead to saved lives (van Wassenhove, 2006). In addition to the beneficiary there are multiple actors, such as humanitarian organizations, donors, implementing partners, and local governments (Kovács and Spens, 2007) who are interested in the performance of humanitarian supply chains, both to understand how it can be improved and to gain knowledge of how the funds were used in the operations. This interest is observable in humanitarian actors’ efforts to measure the performance of their activities. Major donors, such as the European Development Fund and the United Nations (UN), ask implementing partners to monitor and evaluate their programs and measure their operational performance (Tatham and Hughes, 2011). The heavy reporting requirements have been criticized by humanitarian organization to counteract efficiency requirements in emergency settings. However, humanitarian organizations have also recognized that if supported

by data, funding appeals are more likely to reach a wider audience; and they have started to value information based decision making, instead of anecdotal. The performance measurement of humanitarian activity can thus be in line with both humanitarian organizations' and donors' desire to improve the transparency of operations and preferably lead to a better level of accountability (Zimmerman and Stevens, 2006).

Consequently, umbrella organizations, such as the Humanitarian Logistics Association (HLA) and the Active Learning Networks for Accountability and Performance in Humanitarian Action (ALNAP), are striving to support humanitarian actors in their attempt to measure the performance of their own activity (Bölshe, 2012). The World Bank has again addressed the issue by publishing country-specific, logistics performance indicators measuring the efficiency of customs clearance, quality of infrastructure, ease of arranging competitive process shipments, competence and quality of logistics service, ability to track and trace, and shipments and schedules (Majewski et al., 2010; Arvis et al., 2010; Bölshe, 2012). The Spheres standards (Sphere Project, 2011) are another policy initiative to issue a set of standards and indicators to guide humanitarian operations. These efforts to support humanitarian organizations in measuring performance have also led to the presentation of sets of performance measurement metrics, for example, the Fritz Institute's indicators, including appeal coverage, donation-to-delivery time, financial efficiency, and assessment accuracy (Davidson, 2006).

Similar to the practitioners, researchers have recently begun paying attention to humanitarian performance measurements, and several metrics have been developed to apply to the humanitarian context (de Brito et al., 2007; Schulz and Heigh, 2007; Beamon and Balcik, 2008; Blecken et al., 2009). According to Davidson (2006), performance measurement metrics are recommended to be aligned with organizational goals in order to push supply chains toward the right goals and thus improvement. However, Abidi and Klumpp (2013) highlighted that one of the challenges in measuring performance in the humanitarian setting is a misfit between short-term operative goals and long-term strategic goals. There are other challenges identified when trying to measure humanitarian operative performance due to the difficulty in obtaining accurate data and limited information technology. Most challenges in developing and implementing humanitarian performance measurement are results of the complex operative environment, with limited ability and motivation of humanitarians to gather accurate data before saving lives, for example (Tatham and Huges, 2011). Related challenges involve criticism that humanitarian actors only implement measurements of the process and output, not the outcome or impact of humanitarian activities. Thus a broader scope is called for that not only considers processes when measuring performance but also both short- and long-term goals (Abidi and Klumpp, 2013). Examples of the long-term goals excluded from current performance measurement frameworks are impact from the beneficiary's perspective and impact on society.

This thesis takes a step towards addressing the question of performance in humanitarian operations, not only by reviewing humanitarian processes and outputs, but also by broadening the perspective to include the impacts on the beneficiary (from a program perspective) and on society (from a sustainability perspective). However, these questions cannot be addressed without considering the challenging operative conditions characterizing the humanitarian setting.

Thus, this thesis also takes into account the operative complex environment by applying the contingency and goal-setting theories to the analysis of the humanitarian supply

chain performance. The contingency theory assumes that performance is not only related to organizational strategies and structures, but also vitally influenced by the environment (Lawrence and Lorsch, 1967; Thompson, 1967; Donaldson, 1996). On the other hand, the goal-setting theory explains in more detail the relationship between the goal and the performance.

In summary, an understanding of humanitarian performance and performance objectives requires a scope beyond the humanitarian organizations and their supply chains, also considering contextual factors. Tatham and Hughes (2011, p. 78) concluded that:

“Unfortunately, the resultant measures that are adopted are not directly applicable to situations in which the normal livelihoods, social networks, physical infrastructure and communities of individuals have been severely disrupted.”

1.1 Overall aim and research questions

The overall aim of this thesis is to analyze how supply chain performance is understood in the humanitarian context. In order to do so, this thesis, throughout its various essays, intends to help the efforts toward a framework based on the contingency theory in the humanitarian context. The general aim is relevant, since it contributes to the aid effectiveness discussion at an operational level, and it endeavors to grasp and present a more holistic view of humanitarian supply chain performance. To support this aim, the following research questions (RQs) are elaborated on in the essays:

RQ1: How is efficiency understood in the humanitarian context? (Essay 1)

RQ2: What is the link between supply chain performance and impact of humanitarian activity in the humanitarian context? (Essay 2)

RQ3: How is sustainability understood in the humanitarian context? (Essay 3)

RQ4: What is the link between country logistics performance and disaster impact in the humanitarian context? (Essay 4)

1.1.1 Scope and delimitations

Each essay contributes to the overall aim from different perspectives and levels. Essays 1, 2, and 3 study humanitarian supply chain performance at a micro level, where the objective concerns the humanitarian activity, the organizations involved, and particularly, the supply chain. Essay 4 confronts the question of logistics performance at a macro level, analyzed from a country perspective, and where the impact is not that of a humanitarian activity but that of a disaster. Figure 1 presents the scope of each essay.

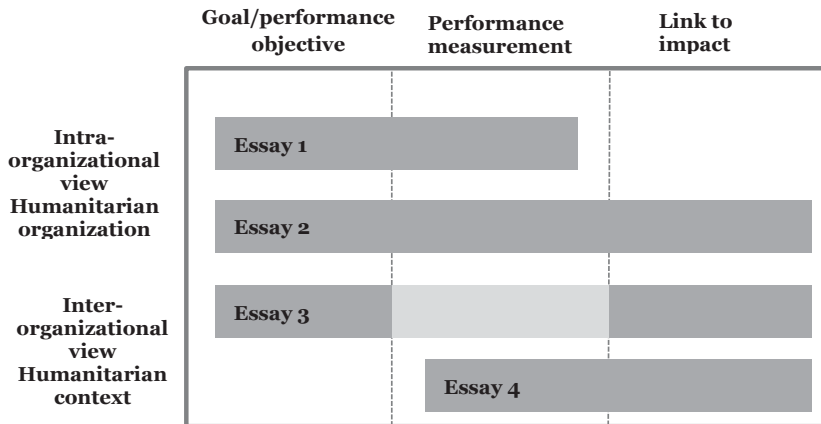


Figure 1 Scope of each essay

This thesis applies to both intra-organizational and inter-organizational views on supply chains. However, the intra-organizational view is applied only from the perspective of humanitarian organizations and donors, whereas Essay 3 also takes other perspectives into account, and Essay 4 further extends the scope to a macro-economic view. The primary data analyzed for this thesis comes from either organizations or donors. Although the thesis is concerned with the impacts and outcomes of humanitarian activities, no primary data is gathered that states how the most imperative actor, the beneficiary, understands performance. Studies that seek the beneficiary feedback are called for by researchers (Oloruntoba and Gray, 2009; van der Laan et al., 2009; Kovács et al., 2010), since there is a lack of such research both in humanitarian logistics and development aid literature. This delimitation is addressed in Chapter 5, section 5.2.3: Further research.

Furthermore, although partly building on aid effectiveness literature (see e.g. Burnside and Dollar, 2000; Hansen and Tarp, 2001) from an operational perspective, this thesis takes no stand on the overarching question of whether or not aid works at all; nor does it question the overarching goal of humanitarian activities. Excluding the ideological question of humanitarian activity is important to recognize, since research such as this thesis can be regarded as part of that humanitarian activity and thus equally part of potentially doing either good or harm. This thesis therefore assumes that humanitarian activity contributes more “good” than “harm.”

1.1.2 *Structure of the thesis*

Comprising four essays that provide insights into each presented research question, respectively, this thesis is structured as follows. The positioning of the research in relation to existing literature on humanitarian logistics, performance management, and

measurement is discussed in Chapter 1. The essential theoretical perspectives (contingency and goal-setting theories) are covered in Chapter 2. Chapter 3 focuses on the research design—the methods used and research quality, followed by an individual presentation of the methods in each essay, including a description of the data collection and analysis. Chapter 4 provides an overview of the key findings, and each essay and its findings are first presented separately and then discussed together. The theoretical contributions and practical implications are also presented in this chapter. Chapter 5 includes the conclusions and suggestions for further avenues of research. Figure 2 illustrates the structure of the thesis.

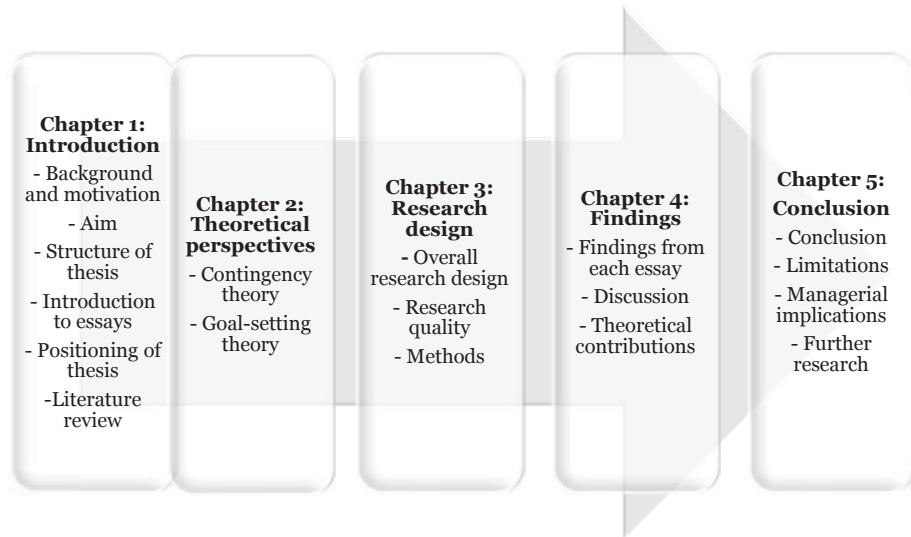


Figure 2 Structure of the thesis

This thesis examines the findings from four different essays that all contribute to answering the research questions. The essays and their positions in terms of academic publication are briefly presented here.

Essay 1: “Performance in humanitarian supply chains: uncovering the denotation of efficiency through a contingency approach.” Essay 1 responds to RQ1 regarding the organizational understandings of performance in humanitarian supply chains, particularly effectiveness and efficiency, and presents a longitudinal case study of one humanitarian organization. This essay is co-authored and submitted to International Journal of Physical Distribution & Logistics Management.

Essay 2: “Aligning humanitarian operational performance measurements with impact assessments.” This essay responds to RQ1 and RQ2; it seeks a link between operational performance measurements and impact assessments of humanitarian actions. It conducts a content analysis on evaluation reports commissioned and published by the Ministry for Foreign Affairs (MFA) of Finland. This solo-author essay submitted for publication in the Journal of Humanitarian Logistics and Supply Chain Management.

Essay 3: “Perspectives on sustainability in humanitarian supply chains.” This essay responds to RQ3 and aims to analyze different understandings of sustainability. Its research design consists of quantitative and qualitative content analyses. The content

analysis is used to assess the annual reports of humanitarian organizations regarding their overall discussions on sustainability and in relation to contextual expectations, subsystems and supply chains, organizational structure, and strategy. This essay is a co-authored study that is accepted for publication in *Disaster Prevention and Management: An International Journal*.

Essay 4: “Disaster impact and country logistics performance.” This essay responds to RQ4 and seeks a correlation between logistics performance and disaster impact at a macro level. A correlation analysis is performed with the variables of disaster impact published in the EM-DAT emergency events database (EM-DAT, 2009) and country logistics performance as defined by the World Bank’s (2010) logistics performance indicators (LPI). This is a solo-author essay published through a blind, double peer-review process as a book chapter in *Relief Supply Chain Management for Disasters: Humanitarian Aid and Emergency Logistics*.

1.2 Humanitarian supply chain performance

This thesis is positioned within existing supply chain management literature, particularly about supply chain performance management, measurement, and humanitarian logistics (see Figure 3).

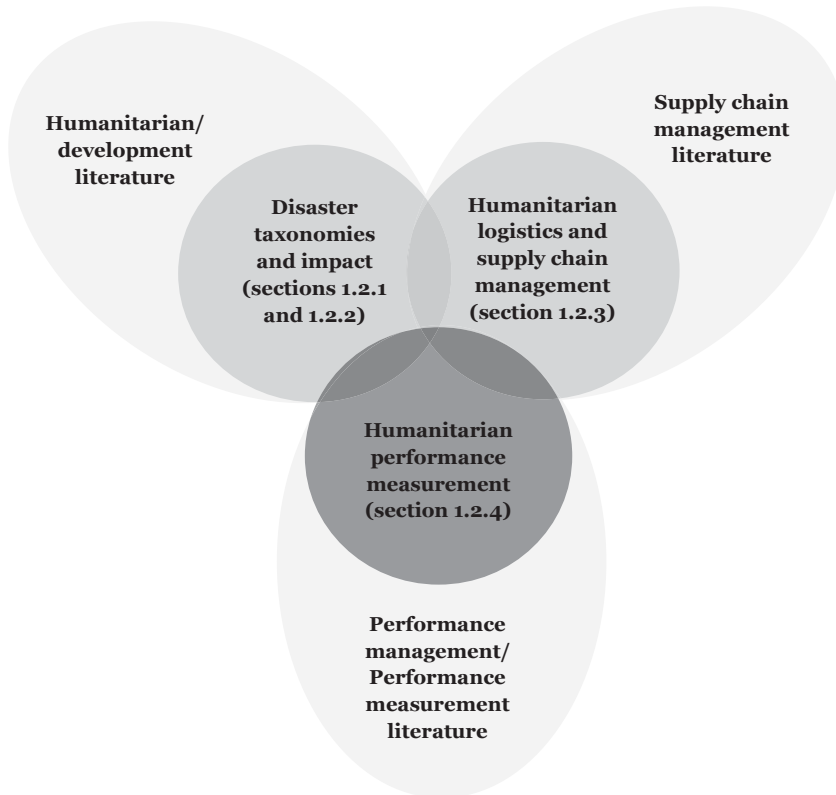


Figure 3 Scope of the thesis

1.2.1 Disaster taxonomies

A pre-assumption that defines the humanitarian logistics research field is an understanding that humanitarian activity is separated into emergency relief and long-term development aid (Safran, 2003; van Wassenhove, 2006). In between these is a brief (a few days to weeks) transition phase in which the actors involved shift from lifesaving to development operations (Safran, 2003). This assumes that the emergency relief is always temporary and that the development aid is long term. Table 1 presents existing disaster taxonomies.

Table 1 Disaster taxonomies

Disaster taxonomy literature	Scope of and parameters in taxonomy
van Wassenhove (2006)	Relief vs. development aid, slow vs. rapid onset, natural vs. manmade
Listou (2008)	Natural vs. manmade from crisis management perspective
Altay and Green (2006)	Mitigation, emergency relief, recovery
Safran (2003)	Disaster relief cycle: planning, responding, and recovery
Holguin-Veras et al. (2012)	Adds scale to van Wassenhove's disaster taxonomy
L'Hermitte et al. (2013)	Disaster scale and socioeconomic, conflict, environmental, infrastructure, and governmental situations

Van Wassenhove (2006) suggested that humanitarian activity is divided into emergency relief and development aid. This distinction presupposes the commonly accepted notion of humanitarian operations being categorized into various phases. Most humanitarian organizations and funding bodies follow a similar division (for example, in funding applications), and some governments have specific regulations for the emergency relief category, where customs clearance processes can be expedited for airlifted goods. However, many humanitarian organizations adopt a more circular, learning loop model that links these phases to one another, borrowing from Safran's (2003) disaster relief cycle.

Van Wassenhove (2006) further divided emergencies into the slow/rapid onset and manmade/natural disaster categories. An example of rapid-onset natural disasters is an earthquake, and slow-onset natural disasters can be famine, for instance. When viewing disaster statistics (EM-DAT, 2013), a similar categorization is used, but enhanced with a complex disaster category, where there might be a slow- or rapid-onset disaster simultaneous with an ongoing manmade conflict. Accessibility and security aspects make such environments most vulnerable and humanitarian activity in complex disasters challenging. Furthermore, such environments with a looming, slow-onset disaster might be acutely hit by a rapid-onset disaster. This situation poses challenges on one hand, and on the other, humanitarian supply chains are often already in place in such environments, leading to scaling up these existing supply chains, not necessarily implementing completely new ones. Listou (2008) further problematized the simple distinction between natural and manmade disasters from a peacekeeping and crisis management perspective. Holguín-Veras et al. (2012) added the dimension of the scale

of the disaster, which is one of the aspects—alongside socioeconomic, conflict, environmental, infrastructure, and governmental situations—superimposed to the van Wassenhove taxonomy by L'Hermitte et al. (2013). Nevertheless, a disaster taxonomy is very useful from a supply chain perspective, since it has led to a discussion of the applicability of humanitarian supply chain strategies such as lean and agile principles (Taylor and Pettit, 2009).

Yet a disaster taxonomy can have other implications. There is the question about how to manage the transition from one category to another. As stated, in between relief and development is a brief (few days to weeks) transition phase where the actors involved shift from lifesaving to development operations (Safran, 2003). However, this presumes that relief focuses on saving lives only and that it is short term. Emergency and recovery are therefore viewed as two different supply chain processes, short term in the emergency relief phase and long term in the recovery phase (Blecken, 2010). According to Blecken (2010), the short-term and long-term supply chain processes are similar in all functions but procurement. While there is a growing body of literature on humanitarian logistics that almost per definition focuses on disaster relief, there is a lack of research on the transition from relief to development and few studies on supply chains in the recovery phase (Emerald humanitarian logistics reading list, 2010). Kovács and Spens (2009) found it for example difficult to categorize disasters in Ghana under any of the existing taxonomies, since the distinction between sudden- and slow-onset disasters becomes blurry, in the case of drought while the natural/man-made divide is disputable when it comes to soil erosion, for example.

This thesis questions the presumption on humanitarian activity being characterized by its division into two phases. In reality, humanitarian organizations operate with both emergency relief and development aid activities. This thesis further questions this division, since the transition phase can last for decades and become the status quo in, for example, a refugee camp setting (e.g. the refugee camp in Kakuma, Kenya has operated since 1992). The supply chains in these settings resemble neither an immediate short-term nor a long-term recovery type. Despite the possibly long duration of the delivery of supplies during the emergency or the transition phase, its supply chains are more urgent than those in the recovery phase. As for aid delivery during the recovery phase, programs might be as short-term in duration as those in the immediate phase. For example, a development program supplying a school with textbooks might have a supply chain operating only for the few days when the textbooks are transported and delivered. In this case, the supply chain is short-term and is not characterized by a sense of urgency. Haavisto et al. (2013) conducted research on beneficiary needs in a refugee camp and found that the current phase division (by e.g. Safran, 2003) is simplistic and that more dimensions to humanitarian action are present (Table 2).

Table 2 Phases of humanitarian operations

	Immediate phase	Transition phase	Recovery phase
Short-term program/funding	Short-term, life-saving supply chain <i>(e.g. search and rescue projects)</i>	Short-term, life-sustaining supply chain <i>(e.g. vaccination campaign in refugee camp)</i>	Short-term development supply chain <i>(e.g. delivery of one-time service or product)</i>
Long-term program/funding	Long-term, life-saving/sustaining supply chain <i>(e.g. building and operating a medical clinic to take care of injured)</i>	Long-term, life-sustaining supply chain <i>(e.g. setting up and managing “temporary” housing in refugee camp)</i>	Long-term development supply chain <i>(e.g. setting up educational program or family planning)</i>

(Haavisto, Kovács, and Haavisto, 2013)

As shown in Table 2, the goal and therefore the expected impact of humanitarian activity not only depends on the type of disaster but can differ, based on which phase the humanitarian activity is occurring and the duration of the program funding. The notion of impact is further discussed in the next section.

1.2.2 Impact

In this thesis, the concept of impact has a dual meaning. First, it is understood as the impact of humanitarian activity in Essays 1, 2, and 3, and second, as caused by a disaster in Essay 4. Throughout the thesis, impact is primarily understood as that of humanitarian activity; thus, to avoid confusion when adapting the second understanding, impact is referred to as “disaster impact.”

The impact of humanitarian activity is discussed first. The meaning of impact can have multiple denotations. However, Hofmann (2004) stated that the concept of change is focal in understanding “impact,” and impact not only brings about positive change but also averts negative change (e.g. preventing famine). In aid effectiveness literature, the impact of aid is debated with economic terms, through measurements of economic development, for instance (Burnside and Dollar, 2000; Hansen and Tarp, 2004). In this thesis, impact is understood as a more diverse concept concerned with the impact of humanitarian activity on society and individuals. The impact of humanitarian activity can be divided into institutional and individual beneficiary levels (Leeuw and Vaessen, 2009). An institutional-level impact expectantly cascades to the individual level. For example, an impact at a provincial, institutional level preferably leads to increased welfare for individuals. Furthermore, the link between a humanitarian activity and its impact can be straightforward; for instance, a vaccination campaign can directly impact the number of disease outbreaks (Leeuw and Vaessen, 2009). This causality can also be complex and diffuse (Burgerlein and Dakkak, 2010). In more complex humanitarian programs, the pathway of changes in human welfare and thus the pathway to impact, can proceed from stakeholder dialogue, to changes in strategy, to policy implementation, and eventually, to changes in human welfare. The expanded

concern with the impact of humanitarian activity can be understood in a broader context of accountability, which arises from the public management reforms being undertaken, with Western governments often serving as donors (Leeuw and Vaessen, 2009). Central to these changes is results-based public management, which focuses on the outcome, instead of the input and output. The notion of time adds to the complexity of the impact concept; the immediate impact of an intervention might differ from or even contradict a long-term impact.

The notions of both short-term and long-term impacts are addressed in Essays 1, 2, and 3, whereas Essay 4 is concerned with disaster impact. This thesis follows the definition in the EM-DAT Emergency events database, which measures disaster impact either as the number of people killed or affected, or the economic damage caused by a disaster (EM-DAT, 2009). This definition is only concerned with direct and immediate impact. Whenever this thesis discusses disaster impacting society, it is referred to explicitly as “disaster impact.”

Research on humanitarian supply chains, supply chain performance, and performance measurements are discussed in the next section.

1.2.3 Research on humanitarian supply chains

Research in the field of humanitarian supply chain management has gained attention in recent years as identified in literature reviews on publications in the field by for example Kovács and Spens (2011), Kunz and Reiner (2012), Leiras et al. (2014;). The prominent fields of research are presented in this section and can be identified as:

- The different phases of disaster relief,
- Processes and performance measurement in humanitarian logistics,
- Co-ordination and collaboration among humanitarian organizations, with commercial partners, the military, or in the humanitarian supply chain,
- Specific functions and activities in the humanitarian supply chain,
- The agility and responsiveness of humanitarian supply chains,
- Disaster management strategies, and
- Information flows in the humanitarian supply chain.

(Emerald humanitarian logistics reading list, 2010)

Leiras et al. 2014 following up on Kunz and Reiner, (2012) findings, discover in their extensive literature review that most studies published in the field are concerned with the preparedness and response phase. Both literature reviews (Leiras et al., 2014; Kunz and Reiner, 2012) further find that the field is characterized by papers using methodologies of simulation and modelling, supporting findings in previous literature review (e.g. by Altay and Green, 2006). Leiras et al. (2014) further state when analyzing the published studies from a stakeholder perspective that the Government, the NGO, and the UN perspective has gained most attention in humanitarian logistics literature. The list of stakeholder perspectives excludes the category of beneficiary, supporting

findings by Kovács and Spens (2011) that humanitarian supply chain and logistics research has mostly focused on the organization and supplier sides, while the beneficiary perspective has not yet been covered extensively.

Challenges and success factors in humanitarian logistics have however been studied. Kovács and Spens (2009), identify challenges as the lack of the following: exemptions from customs, clear mandates and legislation supporting national humanitarian organizations, and qualified in-country staff. Pettit and Beresford (2009) identified structural, critical success factors in the context of humanitarian supply chains and logistics as: strategic planning, resource management, transport planning, capacity building, information management, technology utilization, human resource management, continuous improvement, supplier relations, and supply chain strategy. On the other hand Gustavsson (2003) identified challenges in humanitarian logistics as: caps in NGO capacity, influx of humanitarian staff, lack of in-depth knowledge, funding bias towards short term response, and lack of investment in technology and communication.

The lack of communication amongst actors has been studied in humanitarian logistics literature via analysis of the involved actors and the collaboration and coordination amongst them. Since no single player has sufficient resources to singlehandedly respond effectively to a major emergency (Balcik et al., 2010), collaboration and coordination among these players have been fairly broadly studied. Pettit and Beresford (2005) identified the players in the field as governments, national nongovernmental organizations (NGOs), foreign NGOs, military organizations, and UN aid agencies. The list of players potentially involved in humanitarian activity has been expanded to include suppliers, donors, other aid agencies, and logistics service providers (Kovács and Spens, 2007). Civil society as a whole (Tomasini and Van Wassenhove, 2009) also plays a part in the field of humanitarian logistics, including the media (Jeffreys, 2002; Van Wassenhove, 2006), which has a role in influencing the funding mechanisms and naturally, the beneficiaries (Kovács and Spens, 2011).

Among others, Perry (2007), Oloruntoba (2005), and Jahre and Jensen (2010) studied collaboration in emergency relief and aid supply chains. Public-private and supplier collaborations have further been the subject of research interest, as well as coordination and collaboration between military and humanitarian organizations (Ebersole, 1995; Kelly, 1996; Pettit and Beresford, 2005; Rietjens, 2007). Furthermore, research on coordination (McEntire, 2002; Hicks and Pappas, 2006; Balcik et al., 2009; Blecken et al., 2009; Chandes and Paché, 2010; Jahre and Jensen, 2010; Kovács and Spens, 2009) has mostly focused on inter-agency (aka inter-organization) coordination that practitioners and the media have pointed out as one of the most important research areas in the field. Furthermore, Oloruntoba and Gray (2009) examined beneficiary satisfaction, specifically on customer service in emergency relief. Balcik et al. (2010) also discussed the beneficiary perspective and stated that the focus on efficiency in the field has led to an oversight of equity considerations.

There are other emerging fields of research in humanitarian logistics. Particular attention has recently been paid to innovation and learning and how these concepts can be developed to support humanitarian relief better during operations (Tomasini, 2012) and towards decision making (Gralla and Szajnfalber, 2014). Humanitarian actors have also recently adapted new information technology, which has motivated research in the area of tools and techniques (Tatham and Pettit, 2010). Such emerging fields where more research has been called for, are studies on that aspect of beneficiary (Kovács and Spens, 2011) and studies that focus not only on the response phase in

emergency relief, but also on the recovery phase and on slow onset disasters (Leiras, 2014; Kunz and Reiner, 2012). Kunz and Reiner (2012) also suggested that case study and survey methodologies should be implemented.

This thesis answers the call for research, not only on sudden-onset disaster but a broader scope of emergencies, by making no distinction between the categories of sudden-onset or slow-onset disasters. In this thesis humanitarian supply chain management integrates supply management and needs assessment within and across humanitarian organizations and other actors (Based on the CSCMP 2011 definition of supply chain management). Humanitarian supply chains are in this thesis further seen to encompass operational activities in the areas of emergency relief as well as development programs, though are not directly active in the area of bilateral or multilateral official development aid. The humanitarian supply chains thus include all actors involved with the material, information, and financial flows related to these programs.

Lastly, the concepts of “do no harm” and “value for money” used as guiding beliefs in the humanitarian sector have led to an interest in linking performance and impact. Although there are quite a few studies on performance in the humanitarian sector (see section 1.2.4: Research on humanitarian supply chain performance), they are all mainly concerned with emergency relief. This thesis adds to the relevant literature with its four essays, all contributing primarily to the humanitarian logistics performance literature (see section 1.2.4) by aligning the concepts of process and performance with strategy and impact. One essay specifically complements the conceptual understanding of sustainability, following Kunz and Reiner’s (2012) call to strengthen such knowledge in the context of humanitarian logistics.

1.2.4 Research on humanitarian supply chain performance

The lack of performance measurements in humanitarian organizations has been recognized by Davidson (2006) and Blecken (2010). Humanitarian organizations seldom have a fixed process for measuring their performance on a regular basis. Blecken (2010) found that only 20% of humanitarian organizations measured their performance consistently. This shortcoming has been claimed to result from the challenging operative environment and the temporary characteristic of relief supply chains. Moreover, the challenges of measuring supply chain performance in a humanitarian setting have been identified in a literature review by Abidi and Klumpp (2013) as follows: 1) difficulty obtaining accurate data, 2) limited information technology, 3) chaotic environment, 4) lack of motivation, 5) potential negative media exposure, 6) human resource issues, 7) general reluctance, 8) conflict between long-term and short-term goals, and 9) lack of internal recognition of the importance of supply chain management. The difficulty in obtaining accurate data, limited information technology, and chaotic environment are all results of the challenging operative environment, where data entry is not prioritized, particularly if the information technology at hand is insufficient. The lack of motivation relates to the process of data gathering and how that data is transformed into information. If performance is measured, but its analysis does not lead to any action or development activity, the actual data-gathering phase can be perceived as discouraging.

A few organizations strive to confront these issues by improving performance measurement in the humanitarian context, such as the HLA and the ALNAP (Bölsche, 2012).

Moreover, the academic community has tried to overcome the challenges by developing frameworks and performance measurement metrics for the humanitarian sector. Majewski et al. (2010:16) recommend that “Humanitarian actors must design performance measurement systems to monitor, manage and account for the efficiency and effectiveness of their logistical systems”. They further suggest that donors should base their funding decisions on proven effectiveness and cost efficiency.

Several performance measurement metrics or frameworks for the humanitarian sector have been developed and presented (Table 3). Most of the frameworks published (Moe et al., 2007; Schulz and Heigh, 2009; de Leeuw, 2010) are based on the balanced scorecard introduced by Kaplan and Norton (1992). However, Davidson (2006) found the balanced score card unsuitable for the humanitarian sector due to the framework’s rigidity and the complexity of the humanitarian context. Other examples of frameworks to measure and manage humanitarian performance are the Supply Chain Operations Reference Model (SCOR) (Blecken, 2010; Bölsche, 2012), ISO, and Six Sigma (Parris, 2013). The SCOR model’s manufacturing component can be deemed unfit for the humanitarian sector, and it has also been claimed to be too rigid for smaller actors without extensive resources available. However, the SCOR model and its applicability were studied by Bölsche (2012), who suggested that the model could work in the humanitarian context when adapted to the organizational and environmental challenges.

Although the differences in the performance frameworks have been studied and published, all have a common denominator of including efficiency as an elementary measurement of performance. In their literature review on humanitarian performance measurement, Abidi and Klump (2013) recognized the presence of the efficiency concept in most studies. Parallel findings are shown in Table 3, where performance measurement studies acknowledge efficiency either from a cost or time perspective (Davidson, 2006; Beamon and Balcik, 2008; Blecken et al., 2009). These studies suggest that the performance objective of responsiveness should also be measured as time efficiency and that of financial competence as cost efficiency.

Hence, if supply chain performance were to be defined by how it would be measured in the humanitarian sector, the most common meanings would be financial performance (Beamon, 1999), as well as time- and volume-related performance (Gleason and Barnum, 1986), with indicators such as lead time and fill rate.

Research on performance measurement in the humanitarian sector has by now been conducted by de Brito et al. (2007), Schulz and Heigh (2007), Beamon and Balcik (2008), and Blecken et al. (2009), among others. In all these studies, performance measurements were developed for emergency relief operations, not for longer-term program supply chains. More specifically, Beamon and Balcik (2008) suggested that performance in humanitarian settings be measured as output, resources, and flexibility. Schulz and Heigh (2009) proposed that they be measured as customer service, financial control, and process adherence. Blecken et al. (2009) further recommended that donation-to-delivery time, output, and resources be measured in relief supply chains.

Although most of the suggestions involved measuring the actual process, not the output, Beamon and Balcik (2008) did take output into consideration when suggesting performance to be measured by population coverage or order fulfillment rate. More specifically, the suggested measurements were order fulfillment cycle time, supply chain adaptability, asset accuracy, coverage rate, order fulfillment rate, on-time

delivery, cost efficiency, resource efficacy, and system utilization rate (Beamon and Balcik, 2008; Blecken et al., 2009).

Table 3 Humanitarian supply chain performance objectives

Suggested humanitarian operational performance objective	Author(s)
Output	Beamon and Balcik (2008); Blecken et al. (2009)
Flexibility	Beamon and Balcik (2008)
Efficiency (resources)	Beamon and Balcik (2008); Blecken et al. (2009)
Cost	Blecken et al. (2009)
Service level (customer/beneficiary/donor)	Schulz and Heigh (2009); van der Laan et al. (2009); de Leeuw (2010)
Accuracy	Davidson (2006); Blecken et al. (2009); van der Laan et al., (2009)
Financial control and efficiency	Davidson (2006); Schulz and Heigh (2009); de Leeuw (2010)
Process adherence	Schulz and Heigh (2009)
Time (e.g. donation-to-delivery)	Davidson (2006); Blecken et al. (2009)
Coverage, equity	Davidson (2006); Balcik et al. (2010)
Utilization	Blecken et al. (2009)
Innovation and learning	Schulz and Heigh (2009); de Leeuw (2010)
Quality of life and well-being	Tatham and Hughes (2011)

Performance objectives are also suggested to be measured, as shown in Table 3. Additional performance measurements adaptable to the humanitarian sector are presented by de Leeuw (2011), who focused on the learning perspective. He argued that more attention should be paid to skills expansion and that the implementation and use of humanitarian, supply-chain performance measurements are key to improving performance. According to Caplice and Sheffi (1994), this learning loop is one of the main goals of performance measurement.

While performance could mean the final output and the impact on society or the supply chain environment, the holistic perspective is not often considered in the performance measurement of humanitarian supply chains (Haavisto and Kovács, 2012). Furthermore, the broader concepts of performance and performance expectations are rarely discussed in humanitarian logistics literature.

Relevant studies also recommended developing performance measurement in the humanitarian sector. For example, Davidson (2006) contended that performance metrics should always be aligned with organizational goals. She further stressed in her study that the measurement system should push supply chains toward the right goals. Thus, she pursued Caplice and Sheffis' (1994) idea that the performance being measured actually improves. In their research on performance measurement in general supply chains, Caplice and Sheffi (1994) stated that these criteria be followed: validity,

robustness, usefulness, economy, integration, compatibility, level of detail, and behavioral soundness. Some players in the humanitarian community have adapted a similar set of criteria, consisting of specific, measurable, assignable, realistic, and time-related (SMART) indicators (UNICEF, 2013). The World Bank (1996) suggests that the following considerations should be taken into account when developing performance measurement indicators: relevance, selectivity, practicality, immediate and leading indicators, qualitative and quantitative indicators. Both Caplice and Sheffis' (1994), SMART indicators' criteria and the World Bank suggestions strive to tackle the tradeoff indicator that the recognized benefits should outweigh the cost and effort of data collection.

Furthermore, major donors, such as the USAID, the European Development Fund, and the UN, ask humanitarian organizations to report on their performance through an M&E process. However, the reporting uses organizational resources, and humanitarian organizations claim that the heavy reporting requirements can counteract efficiency requirements (International rescue committee [IRC], 2010). Organizations such as Oxfam and the Red Cross have fortunately realized that measuring their supply chain performance is not only a necessity for the donor, but sharing and analyzing the information internally can lead to learning and internal development (Oxfam, 2011; International Red Cross and Red Crescent Movement, 2010). This notion is particularly addressed in essay 2, which links performance measurements to M&E.

1.3 Summary

This thesis' overall aim is to analyze how supply chain performance is understood in the humanitarian context. The research questions are deliberated on in four essays. Each essay has a different scope, ranging from an intra-organizational supply chain perspective to a macro perspective on country logistics performance. This thesis builds mainly on the literature about humanitarian supply chain and its performance measurement. To date, the performance literature in the humanitarian context has covered different performance measurement frameworks and suggested specific key performance indicators (KPIs). However, it has not yet tackled the essence of performance measurement (as defined by Caplice and Sheffi, 1994; Davidson, 2006; de Leeuw, 2011), which should be connected to the goal of the activity at hand and support learning and development.

The second aim of this thesis is to help the efforts toward a framework based on the contingency theory in the humanitarian context. Thus, the data is studied and analyzed through a contingency theory framework, as presented in Chapter 2.

2 CONTINGENCY THEORY AND GOAL SETTING THEORY IN A HUMANITARIAN CONTEXT

Performance of humanitarian activity is complex (Pettit and Beresford, 2009) because humanitarian efforts are often located in areas with political, demographic, geographical, cultural and infrastructural complexity. Contingency theory is used in this thesis as a main theoretical frame since it provides a framework where the concept of performance can be explained and analyzed both by internal (organizational structure and strategy) and external (environment) factors. However, goal-setting theory is used as a supporting theory; since this theory explains two concepts in the contingency theory, namely strategy and performance, in greater detail. The following sections will present contingency theory, its history, its relationship to organizational theory overall, and its areas of application.

2.1 Contingency theory

Contingency theory has its roots in organizational theory. It arose from the realization that organizations do not function as entities of their own and that there might not only be one best way to organize (Morgan, 1997). The theory sprung from criticism towards classical organizational theories that aimed to present how to organize for greater effectiveness (e.g., Weberian bureaucracy). Contingency theorists (e.g. Burns and Stalker, 1961; Lawrence and Lorsch, 1967) realized that organizations function in an environment and that they might need to adapt to that environment. Although the idea in itself is quite obvious today, Morgan (1997) points out that looking back at Taylorism and organizing efficiently, the idea that the environment might play a role was quite new in the 1950s and 1960s. Organizational theory in itself strives to explain how organizations can survive, and contingency theory strives to explain how organizations can survive in the environment they function in. Contingency theorists presented an open system view and rationalized that the organization in itself is not a closed system but an open one; the organization is dependent on other external variables, such as the environment. According to Morgan (1997), contingency theory therefore considered organizational theory through four aspects:

How can an organization systematically achieve a good “fit” with its environment?

How can it adapt to changing environmental circumstance?

How can it ensure that internal relations are in balance and appropriate?

What does this mean in operational terms?

Contingency theory was developed as an organizational theory to provide an alternative to theories suggesting that there is one best way to organize and manage (Tosi and Slocum, 1984). The theory was originally presented by Burns and Stalker (1961), Woodward (1965), and Lawrence and Lorsch (1967). Contingency theory was further developed by Hage (1965), Thompson (1967), Perrow (1967), Tung (1979), Schoonhoven (1981), Fry and Slocum (1984), Tosi and Slocum (1984), and Donaldson (2001). The core of the theory is that contingency variables are present that “moderate” (Donaldson, 2001) the relationship between two other variables. Originally, three main contingency variables were introduced: the environment, the organizational structure (size), and the organizational strategy (Burns and Stalker, 1961). A fit between these

variables would lead to better performance. The theory answered a call from practitioners for theories and frameworks that would explain the complexity of the context they were operating in. The theory received support from empirical evidence in the late 1960s, particularly from studies by Lawrence and Lorsch (1967) who identified different environmental characteristics organizations needed to cope with in order to prosper.

The classical approach to contingency theory is portrayed in figure 4, in which the main contingency theory variables are shown: structure, strategy, environment and performance (Donaldson, 2001).

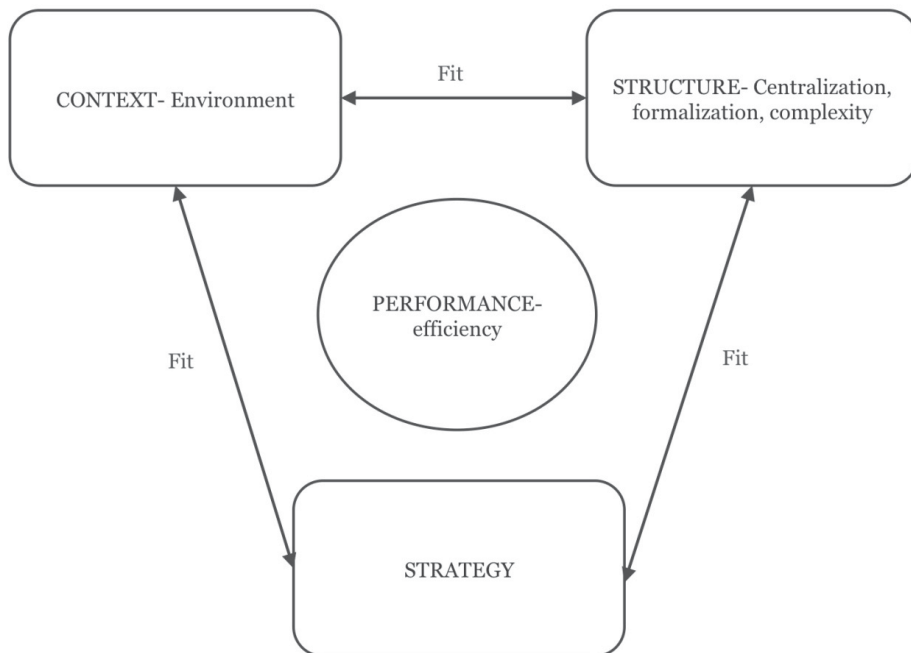


Figure 4 Classical approach to contingency theory

The theoretical model is more complex because four variables interlink (environment, strategy, structure, and performance) instead of three.

Burns and Stalker (1961) came to the conclusion that for a good fit between the intra-organizational variables (structure and strategy) and the external variable (environment), organizations should strive for a mechanic (centralized) structure when operating in certain environments and an organic (decentralized) structure when functioning in uncertain environments. Burns and Stalker (1961) stated that internal structure should follow external contingencies and that organizations working under changing conditions can only be successful if they have an organic structure, while organizations working under stable conditions can be expected to succeed if they have a mechanic structure. Burns and Stalker's stream of contingency research was further developed into "structural contingency theory" (Donaldson, 2001) where the structure of the organization (organic or mechanic) is the focal variable in the theory.

2.1.1 Contingency theory as a stream of organizational theory

In spite of the recognition contingency theory received when it was first presented, a stream of criticism followed. The main criticisms were about the context of fit, what constitutes a good fit and how fit can be defined. The original paradigm of the theory also suggests that the theory is testable through, for example, correlation analysis; testing can be achieved by asking questions such as “does this contingency variable affect another variable?” Testing the theory has been difficult since there is not a clear definition of what a good or bad fit is (Tosi and Slocum, 1984). Most of the criticism towards contingency theory has to do with the lack of rigidly defined concepts and a deterministic assumption that a fit leads to greater performance. Moreover, studies by Pennings (1975) and Schoonhoven (1981) did not find that a relationship between the uncertain environmental characteristics and organizational characteristics would have a clear effect on the success of an organization. Nevertheless, contingency theory has been used in management and organization research in contexts where uncertainty in the environment played a role, and it has received particular interest in information technology research where the fit between strategy, structure, environment, and technology could help explain and develop technology systems for organizations (see e.g., Morton and Hu, 2008; Hong and Kim, 2002; Ifinedo and Nahar, 2009; Lempinen, 2013).

Contingency theory lived on through specific streams of research where a systems view of an organization still made sense and where the uncertainty or certainty of the environment was needed to explain intra-organizational factors. Furthermore, research on temporary organizations and organizations conducting project work, such as consultancy firms (Morgan, 1997), found explanatory power in Burns and Stalker’s (1961) original notion that contingency theory affirms that organic structures fit best with uncertain environments. The following section will briefly describe contingency theory’s areas of applicability in contemporary research (1990 to 2013).

2.1.2 Applications of contingency theory

Contingency theory has been applied in two main research areas: 1) research on information technology and 2) research on temporary organizations or how organizations function with temporary structures, predominantly project and team work (Morgan, 1997). The main area of applications seems to be in information technology research, where the development of information technology needs to take internal organizational aspects and the environment into consideration but not competition to the extent that organizational ecology suggests. Research has been conducted on virtual design teams (Levitt et al., 1999) as well as on strategy, environment, and performance in a technological context (Lee and Miller 1996). In addition, a large volume of research has been performed on the fit between information technology or ERP systems and organizational structure (see e.g., Morton and Hu, 2008; Hong and Kim, 2002; Ifinedo and Nahar, 2009; Wang et al., 2008; Tenhiälä, 2011). The other field of research where contingency theory continues to succeed is the area of innovation and project work (Morgan 1997). It seems that the ability to find a fit in an interchanging environment could be explained by the contingency theory framework. Research has been performed on R&D project groups (Keller, 1994), R&D and fit with market uncertainty (Souder et al., 1998), and the fits between teams made up of external and internal members (Hollenbeck et al., 2002).

These two fields of research are by no means the only ones applying contingency theory in contemporary research, but they are presented here as examples to show that the theory still has theoretical power in specific fields of research.

Although ERP systems and information technology could be seen as part of or at least closely related to supply chain research, contingency theory has not gained as much ground in supply chain research as it has in the field of information technology. This could simply be due to the fact that supply chain research is still an emerging research field that is trying to adopt theories from other fields while developing theories of its own (Halldórsson et al., 2007), or it could be due to the confusion over the meaning of fit (Buttermann et al., 2008). The limited amount of research that does exist on contingency theory in the area of supply chain management and operational research is presented in the next sub-chapter.

2.1.3 Contingency theory in supply chain management

Although contingency theory is rarely namely applied to supply chain research, numerous studies in supply chain management investigate contextual factors and contingency factors. Sousa and Voss (2008) summarized studies and concluded that at least 30 articles in the field of operations management and supply chain management discussed some form of “fit,” 11 discussed the concept of performance, and 33 discussed a contingency variable. The articles discussed in the Sousa and Voss (2007) study include Reed et al.’s (1996) examination of environmental uncertainty and firm orientation; Koufteros et al.’s (2002) discussion of platform strategy, environmental uncertainty, and equivocality, and Sousa’s (2003) analysis of product customization. One of the most cited studies in supply chain management is by Fisher (1997); it is focused on efficiency and responsiveness and can also be said to follow a contingency approach. Fisher argues that supply chain design should find a fit with product characteristics by adopting a strategy of responsive supply chains for products with demand uncertainty and efficient supply chains for products with stable demand. Lee (2002), another often-cited supply chain management researcher, could also be said to apply a form of the contingency approach in his research on supply and product uncertainty (Buttermann et al., 2007). Building on similar assumptions as Fisher (1997), Blome et al. (2013) investigated the influence supply chain agility had on operational performance through a contingency lens. Furthermore, other studies in supply chain management research explicitly test or apply the contingency theory. A specific study on the concept of fit in supply chain management by Buttermann, Germain, and Iyer (2007) suggests that contingency theory is applicable in supply chain management research but that it needs refining and more specific definitions of the concepts, thus supporting Tosi and Slocum’s (1984) findings on the strengths and weaknesses of contingency theory. In addition, the environment, the process design and the goals of humanitarian supply chains were analyzed by Fawcett and Fawcett (2013); their study focused on identifying challenges and opportunities for humanitarian aid and emergency relief in particular. Fawcett, Magnan, and McCarter (2008) further applied contingency theory in their study on supply chain collaboration; they argued that supply chain collaboration can help organizations improve their performance in uncertain environments. Collaboration is further elaborated on through a contingency lens in a study by Fawcett et al. (2012). Ketchen and Hult (2007) have further studied which organizational theories help describe the complex supply chain setting and conclude that further researcher is needed on the applicability of contingency theory in supply chain management research amongst others. Fynes et al. (2005) adapted the contingency theoretical lens to study whether and how supply chain

relationships affect the performance across different competitive environments. Flynn et al. (2010) further studied the applicability of contingency theory in the field of supply chain management and found in their paper through a contingency approach and regression analysis that internal integration and customer integration were directly related to operational performance. They thus defined the “fit” in the contingency framework as a significant relation that can be quantitatively measured. Hult et al. (2007) concluded in their paper on strategic supply chain management that environmental uncertainty, in this case market turbulence, can lead to externally induced changes in the supply chain that are obscure to administrators and difficult to plan for.

The following sections will further discuss what each of the concepts in the contingency theory mean and how they could be understood in the humanitarian context.

2.2 Adapting contingency theory to the humanitarian context

When adapting contingency theory to the humanitarian supply chain, Thompson’s (1967) work on contingency theory is used as a background. Thompson (1967) developed a contingency model soon after Burns and Stalker (1961) as an extended version of contingency theory. In this model, subsystems exist in organizations and a good fit between the subsystems (e.g., production, managerial, and institutional components) and the environment is essential. Some subsystems are more open (and some are more closed) to environmental influences. Thompson (1967) argued that some subsystems have a more extensive need to find a fit with the environment while other subsystems do not. Tosi and Slocum (1984) expand on the model and state that strategic choices are made internally (in spite of the environmental characteristics) in an organization; therefore, they include aspects of organizational culture and values in the classical contingency model. When adapting the contingency lens to this thesis, the supply chain variable is presented as a subsystem (see Figure 5).

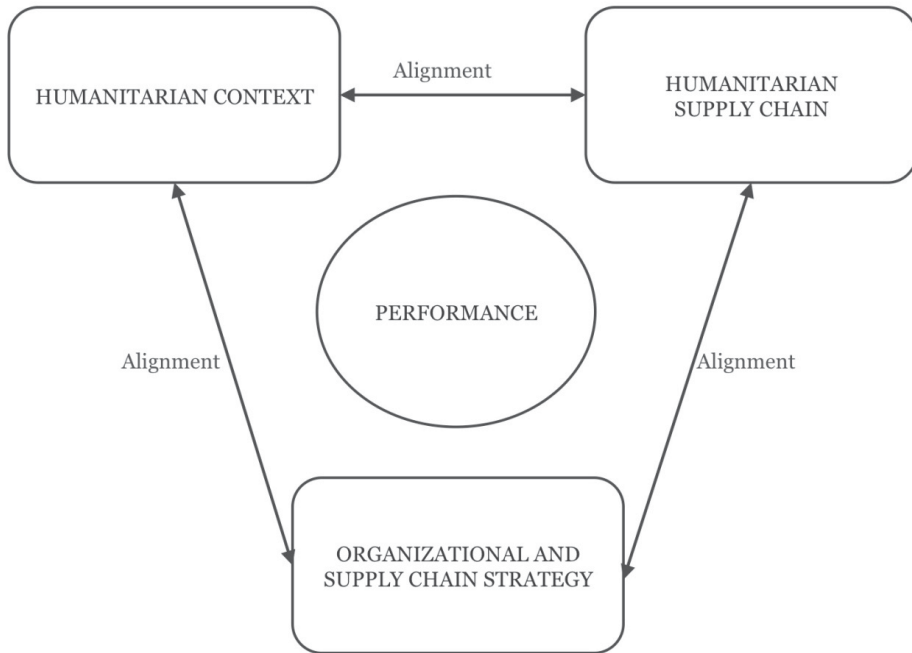


Figure 5 Theoretical framework in the thesis

Figure 5 portrays an adaptation of contingency theory to the humanitarian context, which also serves as the theoretical framework for this thesis. Each of the variables in the theoretical framework are discussed in the next sections.

2.2.1 Structure: humanitarian supply chain

The concept of structure as described by Donaldson (2001) relates to, for example, size and how decentralized or centralized the organization should be in consideration of the fit to the other contingency variables. The concept of structure in contingency theory led to a new stream of research, which is now known as structural contingency theory. Structural contingency theory research is focused on change in structure that depends on other contingency variables, such as environment and strategy. Changes in any of the other contingency variables cause the organization's fit to change, which leads to decreased performance unless it adapts and changes its structure to fit the new contingencies better (Burns and Stalker 1961). Burns and Stalker (1961) found that a variation in the market, such as an increase in demand for technological products, triggered the organization to change from a mechanical (stiff and centralized) structure to a more organic (flexible and decentralized) one.

Although they operate under the same conditions and the same environments, humanitarian organizations can have completely different organizational structures. The Red Cross and Red Crescent Movement, for example, is highly decentralist since it relies on local chapters that function relatively independently. Other organizations, such as organizations affiliated with the UN, can be centralized, for example, through a

centralized procurement department (UNOPS). Several other humanitarian organizations (United Nations Children's Fund, Médecins Sans Frontières, International Red Cross and red Red Crescent Movement and International Rescue committee) incorporate a division between operational staff and so-called program staff. Program staff is responsible for program planning and delivering programs to end users. They are also contact points for external stakeholders such as donors, beneficiaries, local implementing partners, local governments, local authorities, military actors, and so forth (IRC, 2012) (see essay 1). Operational, or supply chain, staff function as internal service providers to the program and execute the main supply chain functions such as procurement, transportation, and warehousing (IRC, 2012) (see essay 1). The structure of most humanitarian transitions seems to still be fairly organic and adaptable to the environment mostly because they are required to adapt. Sociocultural aspects, for example, are crucial to the successful delivery of aid so the organizational structure needs to be decentralized enough to leave room for language and gender aspects to be customized into the services delivered (Kovács and Tatham, 2009). Interestingly, Pascale and Athos (1981) suggested that cultural differences account for differences in processes and design, and Child (1981) suggested that cultural factors be built into the contingency model.

2.2.2 Strategy through the lens of goal-setting theory

Goal-setting theory can further illuminate the concept of performance and strategy when presenting contingency theory. The theory is introduced here and applied in essay 2.

Locke and Latham (1990) stated that organizations should strive to set challenging, yet attainable, goals. The importance of setting goals and actions for organizations was theorized in the 1960s by Locke (1968), who stated that the performance of an organization is enhanced by setting (measurable) goals. According to Locke (1968), the definition of a goal was the aim of an action that one consciously desired to achieve or obtain. Goal-setting theory consequently suggests that a conscious goal will regulate behavior (Locke, 1968; Locke and Latham, 1990). Goal-setting theory has been implemented in the humanitarian sector by Duke and Long (2007), for example, who strived to predict success in "achieving sustainable agricultural systems in developing communities." The weaknesses in goal-setting theory were pointed out by Latham (2004), who argued that the enhanced performance outcome could not be achieved if two or several goals were set at the same time, since a focus on one goal could lead to difficulties in achieving another. According to Latham (2004), trade-offs between goals can include trade-offs between quantity versus quality. Another weakness of the theory was discussed in a study by Knight, Durham, and Locke (2001) in which the participants ignored other aspects of their job because they focused so intensely on the set goal. The same effect has been identified when goals are measured. In operational performance management literature, the effect of individuals being too focused on one goal, thus leading to a blurred understanding of other goals, is discussed as a dysfunctional behavior (Bourne et al., 2003; Caplice and Sheffi, 1994). While goal-setting theory explains the relationship between goal-setting and performance, performance management strives to explain the relationship between goals and the strategic management of activities and performance towards these goals (Lempinen, 2013).

The concept of strategy is not as extensively discussed and defined by contingency theorists as the other concepts in the contingency model. However, the concept of

strategy is well defined in the literature on strategic management. The classical approach to strategy is that strategy aligns organizational “strengths” (competences and resources) with the environment (opportunities and threats) (Venkatraman and Camillius, 1984; Mintzberg and Lampel, 1999). Venkatraman and Camillius (1984) further explored the concept of fit in strategic management and divided the strategic management schools into six schools of research: strategy formulation, strategy implementation, integrated formulation-implementation, interorganizational (strategy) networks, strategic choice, and overarching “gestalt.” The strategy formulation school follows a contingency approach in which the main theme is to align strategy with the environment (Bourgeois, 1980; Christensen and Montgomery, 1981; Hatten and Schendel, 1977; Hofer, 1975; Porter, 1979; Rumelt, 1982; Yip, 1982). Mintzberg and Lampel (1999) further developed 10 categories for schools of research on strategy formulation: design, planning, positioning, entrepreneurial, cognitive, learning, power, cultural, environmental, and configuration. The contingency theoretical approach on strategy is in the research school of “environment,” and Mintzberg and Lampel (1999) state that the associated discourse towards strategy through the contingency theoretical approach is that “it all depends.” Thus, strategy is viewed as a pattern or stream of decisions to make to be able to, as an organization, align with internal structures and processes as well as the environment (Mintzberg et al., 1998; Miles et al., 1978).

In the 1980s, research began criticize the view that one organization had one strategy that fit a static environment. Research by Chakravarthy (1982), Lawrence and Osborn (1981) described strategy as a process (of chance) in which the environmental and the organization needed to be matched on an on-going basis to cope with changes in demand. The view of strategy since the 1980s has been that several levels of strategy exist in an organization. One primary strategy enacts the environment and therefore defines the domain of the organization, and a secondary strategy helps the organization function in the defined domain (Bourgeois, 1980; Venkatraman and Camillius, 1984)

2.2.3 The environment: uncertainty in the humanitarian context

According to Donaldson (2001), organizations depend on their environment, and the best way to organize depends on the environment to which the organization must relate. Lawrence and Lorch (1967) contributed to contingency theory by stating that complex environments necessitate complex organizations. They criticized the definition of the environment as a single entity. Likewise, Burns and Stalker (1961) based their studies on similar grounds; the organizations they studied did not only interact with one environment but with several environments. The environment was therefore not seen as one static entity but as several potentially changing entities. The concept of environment was understood by Lawrence and Lorch (1967) as three sub-environments: the market sub-environment, the technical-economic sub-environment, and the scientific sub-environment. The technical-economic sub-environment is viewed from a production perspective, in which production systems are concerned with processing technology and the environmental changes in them. This division was further elaborated on by Jurovich (1974), who classified environmental characteristics into 64 different types of environments. Other contingency theorists did not specify the concept of environment through sectors (markets, governments, etc.) but rather described the environment with two continua (Tosi and Slocum, 1984), such as homogenous/heterogeneous, stable/shifting (Thompson 2003), or certain/uncertain (Tosi and Slocum, 1984). The environment could further be understood through subdivisions between users of output, input sources, and external regulators (Katz and Kahn 1978) or through an organizational perspective with subdivisions between

customers, capital sources, suppliers, and technology and science (Tosi and Slocum, 1984).

This thesis follows the categorization of the environment into uncertain/certain environments with an understanding of uncertainty mostly in relation to supply and demand but also in relation to place and time. Humanitarian organizations function in a context characterized by uncertainty (van Wassenhove, 2006; Oloruntoba and Gray, 2006; Gatignon et al., 2010; Ergun et al., 2010; Beamon and Kotleba, 2007; Blecken et al., 2009; Taylor and Pettit, 2009; Scholten et al., 2010; Chandès and Paché, 2010). The humanitarian context could be considered one of the most uncertain environments in which an organization can function. Relief supply chains can be said to function in a context of uncertainty in the form of location, type, and volume (Beamon and Balci, 2008), and long-term development aid can be seen as a more “stable” form of aid that functions under uncertainty as well, although it is not as extreme; instead, the uncertainty these organizations face is related more to market uncertainty, such as local resources that are available.

According to Beresford and Pettit (2009), market uncertainty leads to relief operations being reactive rather than proactive, particularly on the demand side in the form of unpredictable need. Private companies can handle unpredictability by improving the predictability of the customers’ needs through better communication and advanced information flow. They can also reduce response times by increasing the efficiency of their supply chain. For humanitarian organizations, it can be cumbersome to improve the predictability of beneficiaries’ needs (Murray 2005) since, in most cases, the beneficiaries, their locations, and their needs are unknown, and information sharing in the last mile of a humanitarian supply chain is rare.

2.2.4 Performance

A good fit between the organizational structure, strategy, and environment should lead to better performance (Lawrence and Lorsch, 1967; Perrow, 1979; Thompson, 2003). Donaldson (2001) argued that effectiveness in contingency theory should be studied because organizational theory is concerned with the success or failure of organizations. Donaldson (2001) stated that effectiveness and performance are exactly the same concept. Traditional contingency theorists (Burns and Stalker, 1961; Lawrence and Lorsch, 1967) referred to performance in their models but defined performance as effectiveness. Tosi and Slocum (1984) argued that the problem with effectiveness is that it is either understood as a too-broad concept when it refers to organizational adaption or a too-narrow concept when effectiveness is only seen as efficiency or profitability. Perrow (1979) and Mott (1972) argued that other ways exist to determine organizational success since other performance objectives might be in place, such as flexibility, morale, or quality. However, the contingency variable of performance is the trigger for most of the critique against contingency theory. The motivation for this critique is that all organizations do not see success only as effectiveness, which was understood as a synonym for performance by the classical contingency theorists (e.g., Burns and Stalker 1975; Lawrence and Lorsch 1967). The success of an organization can also be viewed as employee satisfaction (Dewar and Werbel, 1979), innovation (Hage and Dewar, 1973) or well-being (Alexander and Randolph 1985). Mott (1972) studied effectiveness in Non-Governmental organizations (NGOs) and argued that an NGO can be highly effective in attracting resources, which might be attributable to the organization’s success.

Tosi and Slocum (1984) stated that three dimension of effectiveness exist: efficiency (the way resources are arranged and the amount of resources used to produce a unit of output); outcomes (e.g., quality of work life, security, pay) and socially responsible outcomes (e.g., being a good citizen). The first dimension (the dimension of efficiency) is a main concept in supply chain management literature, in which efficiency can be defined by comparing the output and the input (Beamon, 2004). The variables can be resource-, time-, or cost-related. Operational efficiency can be defined as improving productivity by diminishing input while maintaining constant, consistent output (Slack et al., 1995). Efficiency can be measured by an organization by comparing, for example, the actual time or the actual cost of a process with a standard time or cost of that process (Sutherland and Canwell, 2004). Fisher (1997) defined an efficient supply chain as one in which costs are as low as possible, supply chain processes are highly utilized, minimum inventory is kept, the procurement strategy prioritizes cost and quality, and the performance is maximized as costs are minimized. The concept of performance is studied throughout the thesis, thus not committing to a definition at this stage.

2.2.5 Alignment as fit

The concept of fit in contingency theory is much debated and is still not coherently defined. The concept of fit or congruence is, according to Tosi and Slocum (1984), deeply imbedded in contingency theory because improving the congruence between the environment and the organization leads to improved effectiveness. Fit is therefore focal in the theory since it explains variations in organizational performance, organizational changes, and the relationships between contingencies and organizational structures. So, what is fit, and what is a “good” fit? Tosi and Slocum (1984) stated that fit can be defined or measured in two ways. The first is that it is the relationship between two variables and is measured with a correlation analysis or regression analysis. On the other hand, Drazin and van de Ven (1985) propose that fit be tested through cluster and pattern analysis. Drazin and van de Ven (1985:515) define fit as “a feasible set of equally effective, internally consistent patterns of organizational context and structure”. They explain that this means the organizational patterns of structure and process need to match the contingencies, and organizations need to develop structures and processes that are internally consistent. The term “fit” in this thesis is used interchangeably with the term “alignment.” In this thesis, alignment refers to a definition adapted and modified from psychology literature stating that alignment is the harmonization of goals, objectives, practices, and processes. Alignment in this thesis does not refer to the need for goals, objectives, practices, and processes to be in line or integrated but simply to be harmonized and to support one-another. What it means in each specific essay can be derived from the assumption of what misalignment is. In essay 1, for example, the alignment between processes and strategy and between the supply chain strategy and the overall organizational mission is analyzed. A misalignment between the supply chain strategy and the overall operational mission would mean they conflict and that the prioritization of one would lead to the impossibility of achieving the other. Alignment in essay 3 refers to an alignment in understanding, while alignment in essay 4 refers to a more distinct view of the alignment between goal and objectives as stated in the definition. In essay 4, the concept of the traditional meaning of fit is used, and the essay sets out to seek a correlation. Fit or alignment is therefore essential in this thesis as it is in supply chain research in general, where tradeoffs are commonly studied.

2.3 The application of contingency theory in this thesis

To further understand how each of the essays (essay 1, essay 2, essay 3, and essay 4) link to the main theoretical frame of contingency theory, figure 6 portray the elements of contingency theory that are focal in each essay

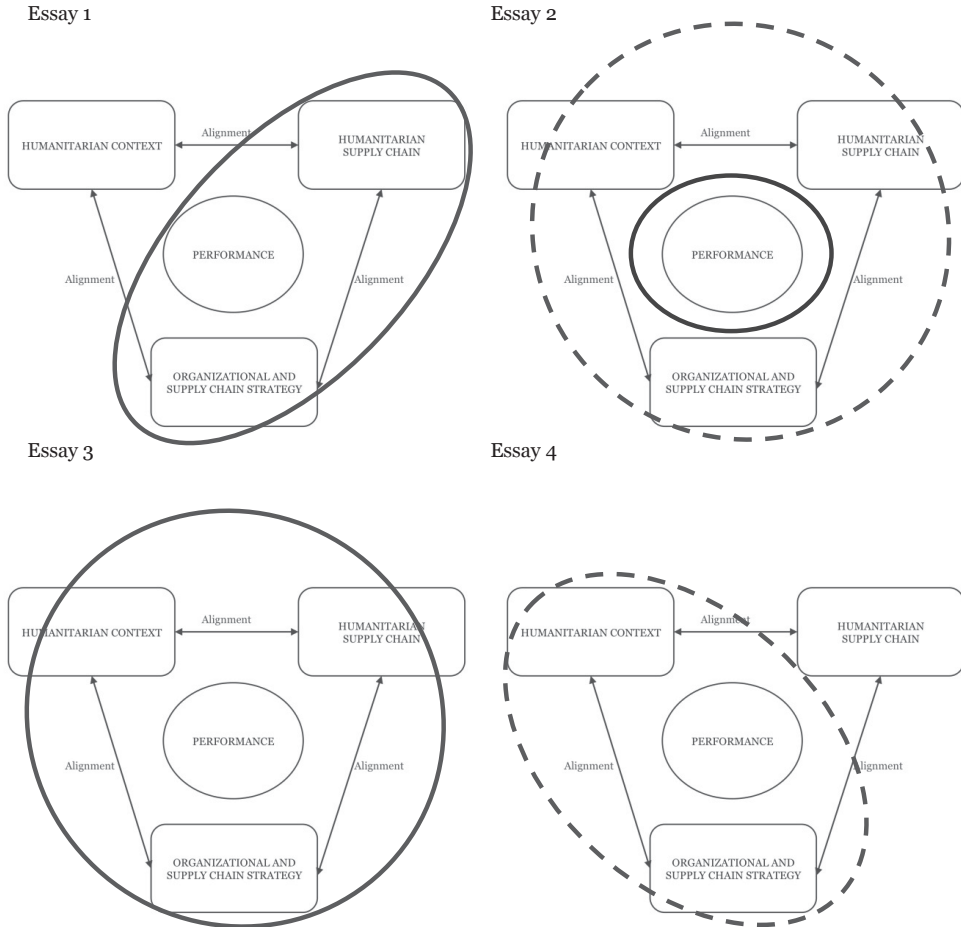


Figure 6 Relation of each essay to contingency theory

Essay 1 focuses mainly on the alignment between the supply chain, the supply chain strategy, and the overall organizational strategy by analyzing performance in the form of performance objectives and measurements in a humanitarian organization. Essay 2, which examines performance and evaluation in the humanitarian context, aims to understand what performance is from an intra-organizational view versus an environmental view, which in this scenario can be seen as impact. Essay 3, which focus on sustainability as a performance objective, examine the understanding of sustainability in the humanitarian context through the supply chain perspective, the

overall organizational perspective (strategy), and the environment as the society. Essays 2 and 4 do not apply contingency theory per se, but they review the concepts of contingency theory. Essay 2 focuses on goal-setting theory, which is briefly explained in chapter 2.2.2. Essay 4 applies neither contingency theory nor goal-setting theory, but it instead aims to understand the relationship between performance and the environment through a correlation analysis on macro-level data of a country's logistic performance indicators and disaster impact.

2.4 Summary

Contingency theory is used in this thesis as the theoretical framework. Contingency theorists claim that the concepts of organizational structure, strategy and the environment need to find a fit to enhance performance. Contingency theory in this thesis is applied to the humanitarian context, where the environment is the humanitarian context which is characterized by uncertainty, the structure of humanitarian organizations is characterized by decentralized structures and the strategy characterized by multiple levels of goals.

The following chapter will present the research design and each essay in more detail.

3 RESEARCH PARADIGM AND DESIGN

This chapter addresses the question of research paradigm and design. The chapter goes into detail on what research approaches and what methods were applied in each essay. The chapter also addresses the criteria for determining the quality in research methods.

3.1 Epistemological stance in the thesis: Scientific realism

Different research paradigms can be categorized in multiple ways. Burrell and Morgan (1979) differentiate between functionalism, radical structuralism, radical humanism, and interpretivism. Another common distinction is positivism versus Interpretivism (Mentzer and Kahn 1995). A general understanding is that several research paradigms fit into an axis with positivism on one side and intepretivism on the other (Mangan et al., 2004). Following Arbnor and Bjerke's (1997) work, Gammelgaard (2004) categorized supply chain research under the paradigms of analytical research, systems research, and actor research. Spens and Kovács (2005) further concluded that Gammergaard's (2004) division, which is commonly used in supply chain research, matches Mentzer's and Kahn's (1995) categorization in the sense that an analytical methodological approach would fit into to the positivist paradigm, the systems approach into scientific realism, and the actor's approach to the interpretivist view. Most supply chain research however fits into the positivism paradigm (Arlbjørn and Halldórsson, 2002; Näslund, 2002; Solem, 2003). This idea is supported by Wolf (2008), who conducted an extensive survey of supply chain and operations management publications, between 1990 and 2006; the results of the review showed that 81% of the articles followed a positivist or post-positivist view. Although Wolf (2008) found a slight shift over time from positivist thinking into more critical thinking, traditional supply chain management field perspectives, theories, and methods follow a positivist view.

There has, however, been a call to apply other philosophies of science (Adamides et al., 2012; Spens and Kovács, 2005; Stock 1997; Arlbjørn and Halldórsson, 2002; Näslund, 2002; Aastrup and Halldórsson, 2008; Stock et al., 2010; Tokar, 2010). Researchers have criticized the homogeny in supply chain research in which primarily deductive research methods are used (Adamides et al., 2012). Suggestions provided in answer to this call have been to adapt a scientific realism approach to supply chain research, to apply qualitative and pluralistic research approaches to better incorporate the managerial context (common in supply chain research) and to more explicitly recognize the subjectivity of the research process (Näslund, 2002; Kovács and Spens, 2005). Nevertheless, researchers have stated that the methodological implications of critical realism for management research "remain sketchy" (Adamides et al., 2012; Miller and Tsang, 2011), since there have not been many cases that adopt critical realism and pluralism in methodology as suggested in supply chain research. The epistemological positioning of this thesis takes on the view of scientific realism. Scientific realism can further be divided into critical realism and social realism (Kovács 2006), in which both streams attempt to ease the bi-polarization of positivism and interpretivism (Outhwaite 1999; Wilson and Greenhill 2004), but critical realism is closer to positivism while social realism closer to interpretivism (Kovács 2006). Through the pluralism in the methodology, this thesis strives to explicitly recognize the subjectivity of the research process. The thesis consequently leans on the work of Sale et al. (2002), who claim the world is complex in itself and consists of interpretivist and positivist phenomena.

The separate studies in this thesis all follow the epistemological standpoint of scientific realism, although, due to their research design, three are closer to critical realism (essay 2, 3 and 4) and two are closer to social realism (essay 1). In the table below, each essay and their research designs are presented. The specific methods used are further presented in the following section. Table 4 and the following section introduce the research design and main methods used in the thesis.

Table 4 Specification of methods in each essay

Research question	Essays	Method
<i>RQ1: How is efficiency understood in the humanitarian context?</i>	Essay 1	Case study
<i>RQ2: What is the link between supply chain performance and impact in a humanitarian context?</i>	Essay 2	Content analysis
<i>RQ3: How is sustainability understood in the humanitarian context?</i>	Essay 3	Content analysis
<i>RQ4: What is the link between country logistics performance and disaster impact in a humanitarian context?</i>	Essay 4	Correlation analysis

3.2 Overall research design: mixed methods

The overall research design uses a mixed methods approach. As such, the research is divided up into separate studies (articles), and the methods in the studies differ. Mixed methods such as secondary data, interviews, and surveys are used in the focal study (essay 1). This thesis begins with the inductive reasoning in essay 1 since, following Mears-Young's and Jackson's (1997) statement of that: "there are questions that never will be asked because there are problems that are never seen" (Mears-Young and Jackson, 1997); thus, the current state in a case organization will be analyzed. The case study (essay 1) applies the concurrent nested design using quantitative and qualitative methods. Essays 2 and 3 use the content analysis method. The thesis then moves to deductive reasoning to answer Research Question 2. To answer the second research question on the link between performance objective and impact, essay 2 applies the method of content analysis whereas essay 4 analyses the link quantitatively on a macro-level through correlation analysis.

3.2.1 Mixed methods approach

The mixed methods approach has a long history, particularly in the field of ethnography in which several data sources are commonly used in studies (Moran-Ellis et al., 2006). Furthermore, this approach has gained ground in the field of social research (Green et al., 2001), particularly in the fields of education and health (Moran-Ellis et al., 2006). Moran-Ellis et al. (2006) recognize five benefits: (1) increased accuracy and confidence in research findings; (2) generation of new knowledge through a synthesis of findings from different approaches; (3) hearing different voices and multiple constructions of the phenomena; (4) reflection of the complexity and multifaceted ontology of a phenomena; and (5) logical implementation of a theoretical framework.

Based on the reasons above and additional benefits, a fairly wide consensus exists that mixing methods can strengthen a study (Green and Caracelli, 1997). Quantitative and qualitative methods have critics, and studies mixing methods strive to use the best from both methods to eliminate the weaknesses in the methods. Mixing methods can consequently neutralize or cancel some of the drawbacks found in each method when they are used on their own (Creswell et al., 2003). The actual mixing of methods can be referred to by several different terms including multi-method research, methodological triangulation, or multi-method design (Creswell et al., 2003). Fielding and Fielding (1986) define mixed method research as involving a mix of quantitative and qualitative methods of data collection and analysis in one study. Arguments for using mixed methods include the validation, verification, complementing, development, initiation and expanding (Bryman and Bell, 2007) of the research. Due to the different reasons for using mixed methods, the actual sequence of the methods used varies. When used to complement or further develop an idea or findings, research could first use one method and then another. But when the methods are used to triangulate data, the methods are to be used simultaneously and the findings are analyzed in a composed form. When two (or more) methods are used simultaneously, this is referred to as concurrent triangulation design (Creswell et al., 2003) which means that qualitative and quantitative approaches are used to “confirm, cross-validate, or corroborate findings within a single study” (Tashakkori and Teddlie, 2003). When different methods are used in sequence, this is referred to as concurrent nested design, in which one design is predominant and the other method is complementary: ‘a quantitative strand/phase is embedded within a predominantly qualitative study (quan + QUAL) or vice versa (QUAN + qual)’ (Tashakkori and Teddlie, 2003). In this thesis, the mixed methods approach follows a concurrent nested design since the methods are applied in sequence and complement each other, thus generating more knowledge of the phenomena of supply chain performance in a humanitarian context instead of validating it.

The disadvantage of the mixed methods approach is related to increased validity. When mixing qualitative and quantitative methods, the paradigmatic Moran-Ellis (2006) state that the ‘difference between positivist and interpretivist accounts of the nature of social reality nullifies the interpretation of convergence as an indicator of measurement validity’. Mixed methods users tend to claim that by using several methods, one might not be able to verify measurement validity; however, one can discover different aspects and layers of a phenomenon. Sale et al. (2002) follow this argument and state that since the world is complex, it consists of interpretivist and positivist phenomena. This thesis sets out to increase knowledge of supply chain performance in a humanitarian context through mixed methods, but not to falsify or verify findings in studies through the use of several methods. To further support the use of mixed methods in this thesis, Kelle (2001) states that for studies that operate on both a micro-level (in this research essay, 1, 2, and 3 operate on a micro-level) and a macro-level (Essay 4 operates on a macro-level), one method cannot offer a sufficient basis for explanation.

3.2.2 Case study (essay 1)

Case study research can be appropriate, especially when studying supply chain management and associated managerial issues since this method allows flexible data collection (Seuring, 2005). The purpose of case study research is to identify and describe critical variables (Stuart et al. 2002), identify links between variables, test developed theories, and predict future outcomes or theory extension and refinement (McCarthy, 2005). Since supply chain management is a rather new research field,

Seuring (2005) argues that there is still a need for conceptual and theory-building research. Yin (2003) and Saunders et al. (2003) suggest that when the aim of the research is theory building, this can be achieved through case studies. Although criticized for their un-generalizability, case studies can contribute to an in-depth understanding of an emerging phenomenon, particularly when conducted as longitudinal studies (Eisenhardt, 1989) and when proper data validation takes place, e.g. in the form of triangulation of data (Meredith, 1993).

Whilst supply chain management is a new research field (Seuring, 2005; Croom et al., 2000), humanitarian logistics is itself an even newer research area (Day et al. 2012) and can therefore be seen as explorative. Since the scope of this thesis is on supply chain performance and performance measurements, which are fairly unexplored research areas within humanitarian logistics (Beamon and Balcik, 2008), this thesis aims to uncover new areas for research, describe concepts, and identify possible alignments. Therefore, a case study was chosen as one appropriate research method. To counter the criticism of un-generalizability against case study research, the case study in essay 1, was designed to be longitudinal and to increase the understanding of the phenomena through concurrent nested design.

Research design in essay 1: Performance in humanitarian supply chains: Uncovering the denotation of efficiency through a contingency approach

The research method used in the first essay is a case study. The essay is a longitudinal case study in which data was gathered over a two-year period. Initial interviews were held in August 2010, a second set of interviews was held in April 2012, a survey was conducted in October 2012, and a verification discussion was held in May 2013. The purpose for conducting a case study in supply chain research is to uncover areas for research and theory development or to explore new territory (Seuring, 2005).

Although this essay is a single case study, the data gathering methods are qualitative and quantitative; they comprise empirical data gathered through a survey in the last phase of the study (see Figure 7), thus implementing a concurrent nested design.

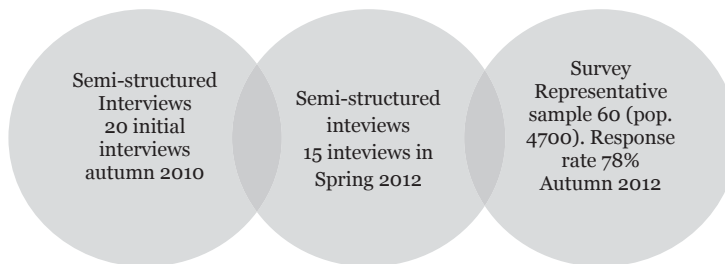


Figure 7 The research process in essay 1

The research began in the autumn of 2010 when process maps for the identified case organization were developed, and 20 semi-structured initial interviews were conducted over Skype with managers and field staff. Ten of the interviewees were management staff at headquarters and ten were field staff ranging from the country director to warehouse manager. Further secondary data was analyzed, including an internal logistics survey conducted in 2009, previously mapped process charts, and supply chain manuals (procurement manual; inventory management manual; vehicle and

equipment management manual; and asset, property and inventory management manual). In the first phase of data gathering, an initial overall supply chain process was mapped based on interviews with managers in IRC headquarters, previous process charts, and existing manuals. The overall process was confirmed and revised if needed through interviews with field staff. The process mapping method can be seen as more transparent than the verbal and written process descriptions (Biege et al., 2012) and is a commonly used method in Operations Management (OM). Process mapping in this study follows the visualization method of event-driven process chains (EPC), which visualizes the following elements: events, functions or activities, logical connectors, units of operation, information, and other graphical items (Scheer et al., 2005). The supply chain processes in the case organization were visualized with the support of the Visio software program. The common challenge in process mapping is to determine the beginning and end of the process as well as the representation of complex activities e.g., including feedback loops (Biege et al., 2012). In a supply chain, such loops occur constantly (e.g., in procurement processes). Procurement requests are commonly sent to and cleared by different entities in the organization depending on thresholds stated by the organization. The visual process maps in this essay are therefore general, and the most challenging dilemmas (e.g., where does the process begin, where does it end, and feedback loops) were discussed and determined in liaison with the core supply chain management group in the organization.

In the second phase of the research, the organizational core strategy and the supply chain strategy were studied through content analysis of the organization's annual report, analysis of internal documentation on strategy, and in-depth discussions with the core supply chain group and fifteen semi-structured interviews over Skype with IRC staff (held between February and May 2012). Semi-structured interviews were chosen to remind the respondents of the topic while providing as much latitude as possible for the responses. While unstructured interviews are often in-depth and the interviewer adheres to a script in structured interviews, semi-structured interviews are a mix of these two approaches (Fisher, 2010). The semi-structured interviews also include some characteristics of the critical incident approach, in which respondents are requested to think of a particular situation they had to deal with (Fisher, 2010)

The data was furthermore triangulated with a third data gathering phase (see Figure 2) in the form of a survey. The survey was structured based on findings from interviews in phases 1 and 2. As a data gathering method, surveys are a structured form of data collection (Fisher, 2010; Saunders et al., 2003). A survey was used in the third phase to verify some of the initial findings from the interviews and the process mapping and to validate the data through triangulation. The survey was designed with structured questions (tick the box), rankings, and open-ended questions, in which the respondents could write freely. The survey was constructed to verify the initial findings of the understandings of the organizational process, the supply chain strategy, and the performance objectives. The survey sample was representative; the sample was 60 field staff members in the case organization from a population (IRC field staff) of 4700. The overall response rate was 78% (47 responses) of which the usable responses per question fluctuated between 19 (31%) and 32 (53%). Out of the 32 responses that could be analyzed, 11 respondents stated that they were part of the supply chain department in the organization, while 21 stated that they were in another department (grants, finance, or programs).

3.2.3 Content analysis (essays 2 and 3)

Content analysis is rooted in the quantitative research methodology since it aims at producing quantitative accounts of data with categories and specific rules (Bryman and Bell, 2007). Content analysis was used in Essay 2 since the aim was to understand on a larger scale what measurements and indicators were in use when assessing the impact of humanitarian organizations. Since the research objective was to get an overview and not just a sample, the content analysis research method was chosen. This proved feasible because most evaluation reports were publicly available, thereby avoiding the common research dilemma in the humanitarian field of limited data availability and limited data gathering possibilities. Content analysis can be defined as “a research technique for objective, systematic and quantitative description of the manifest content of communication” (Berelson, 1952:18). According to Bryman and Bell (2007), it is essential when conducting content analysis to focus on objectivity and systematic description. Seuring and Gold (2012) describe four important steps in content analysis: material collection, descriptive analysis, category selection, and material evaluation. Content analysis is commonly used when analyzing communication of some kind (e.g., examining mass media or documents such as organizational annual reports) (Bryman and Bell, 2007). In studies 2 and 3, organizational annual reports and donor valuation reports assessing humanitarian action were analyzed. Content analysis is a robust method since it is replicable, but the method has been criticized. The criticism is mostly due to the fact that not all research questions can be answered with content analysis; for example, research questions asking “why” must be answered using other methods. In addition, the analysis is only as good as the document analyzed. It is nearly impossible to neglect a possible variance in interpretation depending on the coders (Bryman and Bell, 2007). The possibility of variance can to some extent be tackled by using double coders and accounting for inter-coder reliability.

Research design in essay 2: Aligning humanitarian supply chain performance measurements with impact assessments

This qualitative essay analyses impact assessments in the form of monitoring and evaluation reports for programs that received donations from the Ministry for Foreign Affairs of Finland and were evaluated in 2012. The monitoring and evaluation reports are analyzed through a structured content analysis. Content analysis was chosen as a research method since a relatively vast amount of data is available on the subject of impact assessments for humanitarian assistance and content analysis is objective, systematic, quantitative, and reliable when studying published texts (Krippendorff, 1980). Content analysis has previously been used in humanitarian logistics research to, for example; evaluate the skill requirements of humanitarian logisticians (Kovács and Tatham, 2010) and to analyze current humanitarian logistics literature (Kunz and Reiner, 2012). Content analysis can be used to reveal trends and key ideas in text (Spens and Kovács, 2006). For this essay, the material was evaluation reports published by the Ministry for Foreign Affairs of Finland in 2012. A scope of one donor was chosen to obtain a more in-depth understanding of the impact assessment. The in-depth understanding of the actual impact assessment processes is crucial in this essay since the purpose is to understand how supply chain performance measurements could be aligned to impact assessments. Therefore, it would not have been beneficial in this explorative study to analyze several different impact assessment processes. The scope of the Ministry for Foreign Affairs of Finland was chosen since its course of conduct for humanitarian assistance was recently updated (Humanitaarisen avun linjaus 2012). The course of conduct includes specifications on measuring efficiency, effectiveness, the impact of humanitarian assistance, and what the impact assessment process should

entail. This donor was also chosen since it supports different forms of humanitarian action, including bilateral aid given directly to governments and aid through implementing partners, such as humanitarian organizations or non-governmental organizations (NGOs), in the form of long-term development aid programs and emergency relief efforts.

A content analysis on impact assessment publications in the form of public evaluation reports was performed. The content analysis focused on two topics: the process of the impact assessment and the quantitative and qualitative measurements in use.

Research design in essay 3: Perspectives on Sustainability in Humanitarian Supply Chains

In this essay, quantitative and qualitative content analysis was used to assess the annual reports of humanitarian organizations for their discussions on sustainability overall as well as in relation to contextual expectations, subsystems and supply chains, organizational structure, and strategy. Content analysis has often been used in sustainability research as well as on research on sustainable supply chains (Srivastava, 2007; Seuring and Müller, 2008; Seuring et al., 2010).

We sampled large organizations according to the total sum of donor appeals they made in 2010; this information was found using the United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA's) Financial Tracking Services. Appeals were selected as the sampling criterion in order to capture disaster relief-related activities even though many organizations are active in relief and development. While the annual reports are not necessarily a direct reflection of what occurs in the field, they express what organizations want to portray to external stakeholders and reflect the strategies humanitarian organizations use to respond to the contingency factors of sustainability expectations. Annual reports were chosen since the humanitarian sector has not yet embraced sustainability standards, certificates, or reports. We included all annual reports from organizations that issued a general annual report and exceeded 100 million USD in committed/contributed appeals in 2010. This left us with annual reports from eleven organizations: four UN agencies, three Red Cross organizations, and four international NGOs.

Our material collection and first descriptive analysis was conducted using a keyword search including terms such as "sustainab*" and similar Boolean searches. For this, the next step of category selection followed Haavisto and Kovács' (2013) four perspectives framework with a societal perspective, a program perspective, a beneficiary perspective, and a supply chain perspective on sustainability. We used a coding scheme based on existing conceptual frameworks and clear decision rules for categorization to improve the objectivity and transparency of the content analysis (Krippendorff, 2004; Spens and Kovács, 2006). We first analyzed each document separately for each category before proceeding to a category-based cross-document and, thus, cross-case analysis.

3.2.4 Correlation analysis on macro-economic data (essay 4)

Correlation analysis can be used to indicate a predictive relationship and can suggest possible causal relationships. However, correlation analysis only seeks a relationship and not causality (Bryman and Bell, 2007). Bryman and Bell (2007) further state that these types of analyses explore the relationship between two variables and search for evidence that the variation in one variable coincides with the variation in another

variable. When seeking this relationship, one can use Pearson's r or Spearman's ρ . Pearson's correlation seeks to find linear correlations, while Spearman's rank correlation measures if and to what extent one variable increases or decreases when compared to another variable. Spearman's rank correlation does not require that the relationship be a linear relationship. In Pearson's r , the coefficient will lie between 0 and 1, where 1 indicates a strong relationship. Spearman's rank is the same as Pearson's in terms of the outcome of the calculations since the computed value will be either positive or negative and will vary between 0 and 1.

Research design in essay 4: Disaster impact and country logistics performance

Statistical data is used to analyze disaster impact and logistics performance through correlation analysis. The analysis is used to seek a correlation between the logistics performance in a country and the disaster impact. To better understand logistics performance, we utilize specific logistics performance indicators (LPIs). First, a simple Pearson's ranked correlation analysis is conducted between different LPIs and the disaster impact measures from EM-DAT. Three hypotheses were formed: 1) there is a negative correlation between logistics performance and disaster impact; 2) the correlation differs depending on the level of logistics performance (high, medium, low); and 3) the correlation differs depending on the disaster impact measurement used (affected, dead, injured, economic damage).

The data used to measure the country logistics performance is the World Bank's LPI, and the data used to measure the disaster impact is the EM-DAT disaster data. For disasters to be entered into the EM-DAT database, one out of four disaster criteria must be met: ten or more people killed, a declaration of emergency, a call for international assistance, or one hundred or more people reported affected (EM-DAT 2009). A person who is categorized as affected by the disaster in the EM-DAT data base is one who needs immediate assistance; he or she can be a displaced or evacuated person (EM-DAT 2009). In this essay, the EM-DAT database data is utilized since this database has broad coverage of disasters, is fully available to the public, and is often referred to in studies on disaster impact models (see e.g. Loayza et al., 2012; Toya and Skidmore, 2007). The variable chosen to indicate the country's logistics capacity is the World Bank's LPI. EM-DAT classifies disasters into the following 15 disaster types: complex, drought, earthquake, epidemic, extreme temperature, flood, industrial accident, insect infestation, mass movement dry, mass movement wet, miscellaneous accident, storm, transport accident, volcano, and wildfire (EM-DAT, 2009).

The majority of data gathered in the EM-DAT disaster impact data base is on rapid on-set disasters. Storms, floods and earthquakes, which are rapid on-set, represent the majority of killed and affected victims between 2007 and 2012. The other main variable in the analysis is the country WB LPI (The World Bank, 2010). The World Bank first started producing the biannual Logistics Performance Index rankings and compiling the data in 2005. The data is made up of detailed level data on the time and cost to move a typical 20-foot container from the port of entry to a populous or commercially active city in the country. The measured activities are the number of approvals needed for import and export transactions and the time needed for trade document processing, customs clearance, technical clearance, inland transport, terminal handling, and container security measures (Hausman et al., 2005). The data is collected through a detailed questionnaire distributed to experienced logistics practitioners, who are mostly freight forwarders. The ranking of the WB LPI is based on a value from 1 (worst) to 5 (best) (The World Bank, 2010). The value of the rank offers a relative snapshot of the logistics performance in 117 countries.

The following chapter discusses research quality, particularly, validity and reliability of the research.

3.3 Quality in research methods

The process of ensuring high-quality research involves determining whether appropriate methods have been used to collect and analyze data (Karlsson, 2009). This section strives to ensure a high quality in research by following Meredith's (1998) and Yin's (2005) quality criteria for case study research and Kovács' and Spens' (2006) quality criteria for content analysis. Meredith (1998) and Yin (2005) expect case study research to have rigor (systematic procedures), be generalizable (to the extent that the findings could be replicable in a broader context), have an appropriate length (the right amount of data), be valid (do what it says it will do), have construct validity (are the appropriate means used), have internal validity (does the study explain what it is meant to explain), have external validity (are the findings valid in a different context), and be reliable (would the same findings come up if the study were repeated). The primary data collected in this thesis has been reported on as it occurred since all interviews were recorded and transcribed. The aspect of generalizability in this thesis follows Yin's understanding of the generalizability of a case study through analytical generalizability with the purpose following the scientific realism paradigm to develop a context-specific understanding instead of the truth (Järvesivu and Törnroos, 2010). The suitability of the length of this thesis can be debated; however, with regard to the amount of collected data being appropriate, the amount of data gathered was fairly vast, particularly for the main case study (essay 1). This is due to the length of the case study; the data in the essay was gathered over a 2-year period. To discover relevance in the data and not lose important insights due to the volume of information, the data was recorded and transcribed; next, each statement was analyzed separately and then all together. Furthermore, the collected and pre-analyzed data in the focal case study (essay 1) was presented to case organization representatives and discussed after each data gathering phase, which ensured that no information was lost.

The effort to account for construct validity has been achieved through the use of mixed methods in the research. Each research question was answered by the one or two methods best suited for that question. Furthermore, multiple data sources were used. Internal validity checks should focus on whether the relationships presented are also explained by the factors described. The question of internal validity predominantly arises in the data analysis phase. Tashakkori and Teddlie (2009) state that internal validity is important in studies using mixed methods in the form of research interference. Research interference refers to validity in the process of interpreting the findings and the outcome of these interpretations (the emerging conclusions). This means that when accounting for research interference the researcher ought to distinctly separate the findings themselves and the conclusions the researcher draws. In this thesis, the use of previously discussed frameworks, the development of categories and structures for use in analysis, and the effort to record and describe each part as "a chain of evidence" helps ensure internal validity. The aspect of external validity has mostly been addressed through concept definitions. Studies 1 and 3, which analyze different understandings of concept, respond precisely to this quest for external validity in research conducted on humanitarian supply chains since the terminology and conceptual understanding might differ from sector to sector (e.g. private, public).

Guba and Lincoln (1989) suggest that reliability is achieved by documenting the process and methods used in the study, and they refer to reliability in qualitative

research as dependability. Golafshani (2003) states that reliability in qualitative research is stability and is found, for example, through consistency in interview questionnaires. In this thesis, the semi-structured interviews followed the same interview guide and the survey respondents (in essay 1) evidently answered the same questions in the questionnaire. The response rate for the questionnaire was fairly low (53%), which could decrease the reliability for that specific survey.

The content analysis studies (studies 2 and 3) followed Seuring and Gold's (2012) four steps (material collection, descriptive analysis, category selection and material evaluation), thereby guaranteeing coding consistency and stability to ensure reliability. Both essay 2 and 3 followed a predefined coding scheme based on literature as suggested by Kovács and Spens (2006) to guarantee objectivity and transparency in a content analysis. To further ensure validity the categories were fine-tuned throughout the coding process. To ensure reliability in content analysis Kovács and Spens (2006) suggest the use of multiple coders and reporting of discrepancies. In essay 3 multiple coders were possible to use but in essay 2 there was only one coder used due to resource reasons. Reliability in essay 2 was however sought through a step-by-step explanation of the coding.

There are furthermore stated research quality criteria for the use of secondary data (Busse, 2010; Calantone and Vickery, 2010). Secondary data was analyzed both in essay 2, 3 and 4 in this thesis. The criteria for the use of secondary data is that it should be credible and relevant (Calantone and Vickery, 2010). The questions to pose when defining whether the data is relevant is: "does the data represent the subject under study". Since the analyzed data in essay 2 and 3 are reports published by the units of analysis, they can be stated to represent the subject under study. However, in essay 4 publicly available data is analyzed, thus ensuring that others can reproduce the results.

Essay 4 has also other reliability and validity issues to consider since that particular study is a correlation analysis. Reliability of the data is somewhat ensured since public data is analyzed, however, the World Bank Logistics Performance index is not gathered for all countries but only for 154, and it is gathered for purposes of the commercial sector not the humanitarian. The EM-DAT data has also been questioned (Sharma, 2010) since the data is gathered only on the direct effects of a disaster, not long term effects. EM-DAT data validity has further been criticized since the data gathered in the EM-DAT database is reported by the affected countries themselves, with limited possibilities to conduct data verification. The EM-DAT database has however been used in previous studies (see e.g. Toya and Skidmore, 2007) and is viewed as the most comprehensive and reliable data source for disaster data.

Further limitations are discussed in each of the separate studies and also in a limitation section in the end of the thesis. The following section will present the findings on each study first separately and then in cohesion.

3.4 Summary

The epistemological approach of this thesis is scientific realism, thus questioning the positivistic assumption of an "absolute" truth, and instead "contextualizing" an approximate or relative truth. This thesis applies mixed methods. Where essay one is a case study with both qualitative and quantitative data gathering methods, essay 2 and 3 apply a content analysis and essay 4 correlation analyses. Research quality in the thesis

is ensured by taking predefined steps in the research process and through appropriate recording and presentation of these steps.

4 PERFORMANCE IN HUMANITARIAN SUPPLY CHAINS

Each essay in this thesis has a different objective; therefore, the findings in each essay are presented separately. This chapter first serves as a summary of each of the four studies before relating them to each other. Since essay 1 was a more extensive study than what is presented in the attached essay, this particular study is presented here in more detail than the others. The attached essays describe the essential contributions of studies 2, 3, and 4, and they will therefore be presented here more briefly.

4.1 Essay 1 findings: Performance in humanitarian supply chains: uncovering the denotation of efficiency through a contingency approach

The aim of the study was to deepen the understanding of supply chain performance objectives in the humanitarian context through a contingency approach. Therefore, the study considered not only the organizational structure and strategy but also the humanitarian context when examining performance and performance objectives. The study followed a top-down/bottom-up perspective, in which the structure in the organization was first identified through process mapping, and the goals and strategies were then identified through semi-structured interviews (Figure 8).

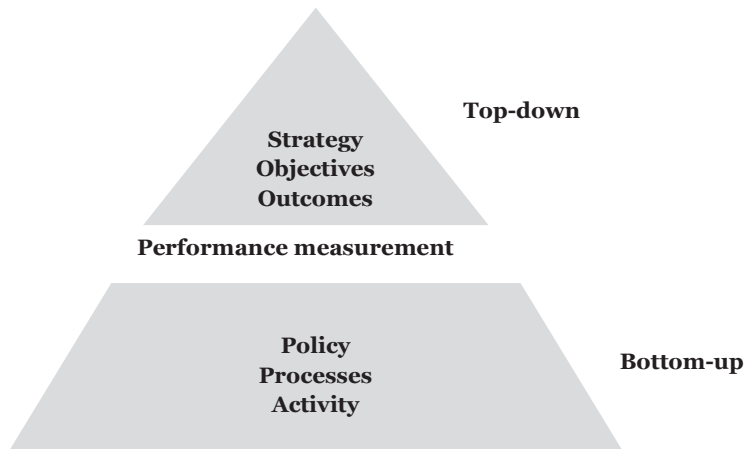


Figure 8 Top-down/ bottom-up approach

Unlike most companies, IRC actually has an articulated supply chain strategy (Perez-Franco, 2010; Harrison and New, 1999). The supply chain strategy was developed and articulated in autumn 2011 and was launched throughout the organization thereafter. The organization's supply chain strategy had been in place for five months before the second phase interviews for this study were conducted. The strategy states that the IRC supply chain should be "efficient," innovative," and "integrated." Since this study aimed to understand performance, we analyzed not only the stated strategy but also the ideas behind the strategy concepts.

Table 5 Summary of understandings of IRC performance objectives

Strategy	Objective
“Efficiency”	Do it right the first time, on time, within budget
Quality (of process)	Service level
Integration	Communication, activity, and own initiative
Innovation	Constant development
Accountability	Process accuracy
Reliability	Dependability, trust, service level

A summary of the definition on IRC supply chain strategy (and other stated performance objective themes) can be seen in Table 5.

Understandings of the theme of efficiency are related to process efficiency (time), in terms of doing something once (i.e., doing something right the first time); time efficiency, in terms of completing something within the expected time or within a time limitation (not speed but reliability); and cost efficiency, in terms of completing projects within the expected (budgeted) cost (not lower costs but within budget). The supply chain strategy themes for the case organization differ to some extent from the themes brought up in supply chain literature, such as responsiveness and efficiency (Chase et al., 2001), efficiency and flexibility (Russel and Taylor, 2003), cost reduction (Ballou, 2004) and integration (Heizer and Render, 2008). The common denominator is efficiency. All interviewees stated in the interviews that efficiency is the most important objective for the supply chain. A global supply chain (GSC) staff member stated:

“Efficiency is using your resources as effectively as possible, to get the most outcome with the input in terms of money/staff/time. Get more done with the resources you have” (GSC staff, 2012).

Efficiency was further defined by a Regional director (2012):

“To me efficient in this case means that we deliver what we promise at the lowest cost possible and that we do so in a way that is accountable to those who are giving us the money and those who are receiving our services”.

Lastly, additional themes presented as important performance objectives were quality, accountability and reliability. These objectives were seen as equally important to efficiency. As stated by a staff member in IRC Global Supply Chain staff (2012): ‘You could probably argue pretty much anything but accountability should be included’. Reliability was further viewed as important in the sense that the supply chain should function as expected; if the supply chain is ‘slow’, it is acceptable if it is known.

The findings from the interviews were complemented by the surveys performed in the second phase (spring 2012) of the study.

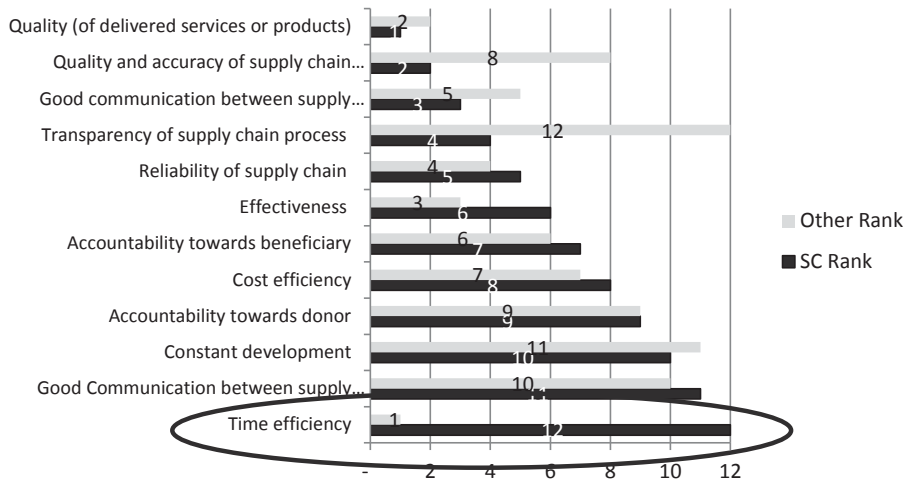


Figure 9 Ranking of supply chain objectives

Based on previously identified humanitarian supply chain performance objectives (see Table 2) and the interviews on performance objectives, a survey was constructed to further understand the prioritization of performance objectives in the case organization. IRC supply chain staff ranked the quality of the delivered product as the most important performance objective; this was followed by the quality and accuracy of the supply chain and good communication. More traditional performance objectives ranked lower; for example, cost efficiency ranked number 7 and time efficiency ranked number 12 (see Figure 9). Interestingly, program and finance (other rank in figure 9) staff ranked time efficiency as the most important performance objective in contrast to their supply chain colleagues. Program staff ranked quality as the next important objective, which matched the views of the majority of the supply chain staff. The radical differences found in views on performance objectives support Jahre and Heigh's (2008) findings that closer internal collaboration between operational program staff is needed.

In terms of performance objectives in the humanitarian sector, the data show that efficiency is considered an important performance objective. However, efficiency does not follow a traditional understanding of productivity when defined (see e.g., Slack et al., 1995) but rather a more comprehensive definition including also aspects of planning, quality and accountability. The long-term focus in strategy and short-term focus in operational processes is common in the commercial sector as well but should not perhaps be as evident in a non-profit organization where the mission is social not economic. This shift from long-term gains (e.g. quality, accountability, and sustainability) to more short-term gains in the supply chain processes (e.g. time and cost efficiency) can lead to difficulties in decision-making prioritization. The performance objective can further be difficult to measure since different understandings may be present in the organization (primarily between program and supply chain staff; and strategic and operational staff) on what the objective is. This misalignment can be related to the complexity of the humanitarian context, where organizations not only provide either emergency relief or development aid, but something in between that can be called humanitarian activity in the "transition stage". It takes place instead, for example, in a refugee camp setting in which the need can

fluctuate between immediate and long term. The supply chain provides for all different goals and strategies of emergency relief, transition relief and development aid, but is requested to have a common supply chain strategy and process to serve these multiple needs.

The study strove to align the different performance objectives in the organization and identified main processes (see appendix 1 and 3) in order to find a way to measure the performance of the supply chain. IRC stated that striving to measure the supply chain performance was for learning and development purposes and thus the purposed echoed Caplice and Sheffi's (1994) work. The purpose as stated by IRC HQ of measuring the performance would be to share information across the organization and to make decisions based not only on anecdotal information. Therefore, the performance measurements were planned to be used in the organization not as a control tool, but rather for information sharing and, to some extent, the standardization of processes (IRC, GSC, 2012). The suggestions of how to measure supply chain performance are in this study mostly quantitative measures, due to discussions with the case organization indicating that the gathering of qualitative data would be too resource-intensive and thus not supporting Caplice and Sheffi's (1994) performance measurement criteria of cost-benefit.

However, the share of unstructured data used in decision making is growing rapidly in the commercial sector, both in relation to data and in absolute terms (Lempinen, 2013). This growing interest in performance management and 'presentation' of performance instead of 'measuring' the performance could fit well in the humanitarian context where the broader goals are social, not only economic. Furthermore, performance measurements ought not to be thought of as static measures that are in place long term after having been implemented. Especially in an uncertain context, such as the humanitarian one, where the organizational structure is suggested to seek alignment with the context (see e.g. contingency theorists Burns and Stalker, 1967 and Lawrence and Lorsch, 1967), performance measures (or presentations) need to be dynamic and thus constantly evaluated and modified.

4.2 Essay 2 findings: Aligning humanitarian operational performance measurements with impact assessments

Essay 2 uses goal-setting theory to identify assessments for humanitarian assistance, the measurements (indicators) in use, and an understanding of how different forms of assessments are aligned. The findings in the essay support Burderlein and Dakkak (2010:22) in their conclusions on the current state of humanitarian evaluations:

“Evaluation criteria are often inappropriate ... Impact evaluation as the one really meaningful approach is almost never done, and is just at the beginning of its development.”

This essay analyzed different forms of assessments that take place in humanitarian assistance and found three forms of assessments with the same goal: to measure the results of aid. These three forms are organizational, on-going performance measurements; program-specific monitoring and evaluations; and impact assessments commissioned by donors to assess the broader impact of the aid. The data was gathered using content analysis on evaluation reports for programs that received funding from the Ministry for Foreign Affairs of Finland in 2012. The first form of assessment, organizational performance measurements, measures operational efficiency and responsiveness (de Leeuw, 2010; Schulz and Heigh, 2009; Moe et al., 2007; Davidson 2006; Beamon and Balcik, 2008; Blecken et al., 2009; Gleason and Barnum, 1982;

Schulz and Heigh, 2009) via indicators such as donation-to-delivery time, population coverage, order fulfillment rate, order fulfillment cycle time, asset accuracy, on-time delivery, and cost efficiency. The second form of assessment, program-specific monitoring and evaluation, measures the output and outcomes of specific programs (Cozzolino, 2012) and shows the causality between the action and its ultimate impact (Tatham and Hughes, 2011; Hofmann, 2004; Roche, 1999) via indicators such as resources used or program supplies/services delivered (Ministry for Foreign Affairs of Finland, MFA 2013). The third form of assessment, impact assessment, measures the overall results of humanitarian assistance (Burderlein and Dakkak, 2010) (see Figure 10).

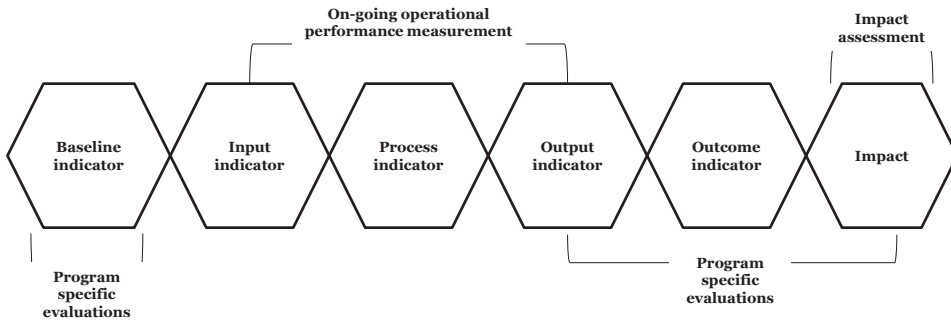


Figure 10 Program evaluation. Modified from Hofmann et al. 2004

Measuring impact seems to be the most cumbersome form of assessment. Challenges arise due to difficult circumstances and a priority on saving lives before setting up structured reporting structures in emergency relief and challenges arise in measuring long-term development aid with complicated policy initiatives. Due to the difficulty of measuring impact, which can be seen in the MFA (2012) evaluation reports, this paper questions the purposefulness of measuring and evaluating program-specific performance in humanitarian assistance to the extent that it is performed today.

Table 6 Different forms of assessment for humanitarian assistance

Form of assessment	Goal	Indicator examples	Source of information/data
Operational performance measurement	Intra-organizational and connected to strategy, e.g. efficiency, responsiveness	Lead-time, use of resources	Operational, e.g. from ERP systems or manually gathered
Program evaluation	Intra-organizational and connected to program goals, e.g. decrease in malnutrition rate, increase in literacy rate	Supplies/services delivered	Financial, e.g. from budget
Impact assessment	Environmental and connected to overall mission, e.g. decrease poverty, development, decrease suffering	Crude mortality, years of schooling, population growth,	Development indicators or demographics, e.g. from local authority

The findings indicate (Table 6) that duplications of effort exist in humanitarian aid assessments since the different forms are not well aligned and that the measurements, evaluations, and assessments are rarely used to meet the learning and development goals they were originally developed for (see Table 6), where arrows indicate potential misalignment). The arrows in the table suggest that according to Davidson there should be an alignment between indicator and goal (column 2 and 3); Caplice and Sheffi (1997) state that the source of data and the indicators should be aligned in the sense that the data is available (column 3 and 4). Further the impact evaluations (see figure 7, Hofmann et al., 2004) state that the process output, the program evaluation and the assessment of impact should be aligned (row 2, 3 and 4). Rather than responding to the goal of constant learning and development, the rigid evaluation of humanitarian assistance responds only to requests for donor accountability. The missing alignment between operational goals, program goals, and long-term relief and development aid goals, such as those for the MDG, is suggested to be analyzed through the common denominator of sustainability.

4.3 Essay 3 findings: Perspectives on sustainability in humanitarian supply chains

The aim of the third essay was to develop a framework for analyzing how humanitarian organizations address different expectations regarding sustainability. Sustainability has gained ground as a performance objective in the commercial sector and is extensively researched in supply chain literature. However, sustainability as a concept is broad and the understandings are multiple both in the commercial sector and in academic supply chain literature. In the humanitarian academic literature sustainability is rarely mentioned, and thus there is no common understanding of what sustainability in the humanitarian sector is. Sustainability is nevertheless brought up in the humanitarian sector as overarching goals set by donors such as for example UNPD.

Thus Essay 3 strives to grasp how sustainability can be understood in the humanitarian sector from different perspectives, from the societal and beneficiary perspective, from a program perspective and from a supply chain perspective. Essay 3 suggests a conceptual framework that combines elements of contingency theory with a four-perspective model on sustainability expectations (Figure 11).

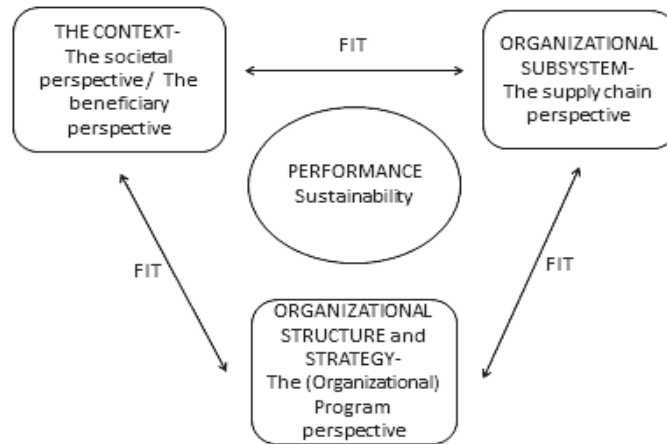


Figure 11 A contingency theoretical framework of essential fits between sustainability expectations

(Based on the contingency theoretical approach of Tosi and Slocum 1984:18)

This framework not only helps separate various perspectives on sustainability and sustainability-related expectations but also seeks a fit between these perspectives. Generally, society expects economic development while humanitarian organizations can only evaluate whether their missions have been accomplished and approach the success of a program from this perspective. Humanitarian programs are not set up in a vacuum; rather, they should support the development of society at large. The findings indicate that some of the aspects of various perspectives on sustainability (societal, program, beneficiary, and supply chain) support each other and are discussed in conjunction with each other in the annual reports. Local sourcing, for example, is part of the societal and beneficiary perspectives. Similarly, if local sourcing includes beneficiaries in a program their empowerment can be supported, which links the organizational structure with the subsystem. Local partnerships have also been seen as facilitating access, which is a fit between the organizational subsystem (e.g., the supply chain) and context. Other fits are surprisingly lacking from the annual reports, such as needs fulfillment; the reports focus instead on the fulfillment of programs or missions. The contextual focus is, however, very visible in how humanitarian organizations address the ecological dimension of sustainability. While little attention is paid to green products, services, or operations, climate change adaptation is considered for the livelihood of beneficiaries and in the search for coping and mitigation strategies. This is in line with Sarkis et al.'s (2011) findings that the goal of humanitarian organizations is to help people with the environment considered second at best.

4.4 Essay 4 findings: Disaster impact and country logistics performance

The fourth essay argues for the importance of logistics in humanitarian response and is only scoped, due to the data used, toward analyzing the role of logistics on a macro-level in disaster response. The country logistics performance is thus seen through the contingency theoretical lens as a factor part of the “environment”. The humanitarian environment can be characterized by infrastructural uncertainty (analyzed in this study) but also unstable supply markets, uncertainties in demand and security related variables. Through a stated hypothesis (see section 3.2.4: Correlation analysis on macro-economic data) it aims to support the argument for the role on logistics (see e.g., van Wassenhove, 2006) for practitioners responding to a disaster and for academics continuing their research on humanitarian logistics; however, it does not quite manage to do so.

The essay seeks to answer the question of whether a country’s logistics performance correlates with the impacts of a disaster; here, impact is measured by the average amount of people affected, the average amount of deaths, the average amount of injured in a disaster, or the average amount of economic damage. This is a quantitative study in which the EM-DATs disaster data is analyzed through correlation analysis against the World Bank’s logistics performance index (WB LPI) (see descriptive data in Figure 12).

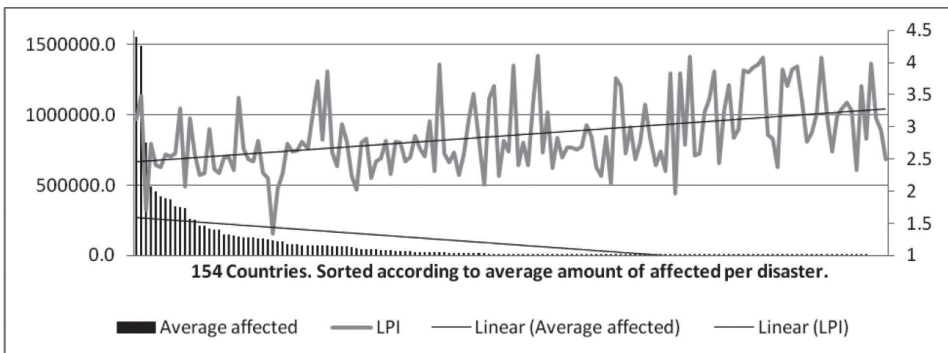


Figure 12 Trend line of (all 154) countries for WB LPI and the disaster impact variable average affected

This essay aimed to analyze the relationship between the logistics performance in a country and the disaster impact. A significant relationship between the WB LPI and the average amount of people affected could be found when only analyzing countries with average WB LPIs. A significant negative relationship is present for these countries, which indicates that countries with a higher WB LPI tend to have a lower amount of affected people per disaster. Among countries with average WB LPIs, countries that fall on the lower end of that group tend to have more people affected per disaster than countries with higher WB LPIs in that group. The correlation analysis also showed a relationship between the WB LPI and the variable average economic damage. The relationship is positive, which indicates that countries with higher logistics performance might have more resources that can be damaged in the course of disaster. Furthermore, the results of the essay show no direct correlation between a country’s logistics performance and the other disaster impact variables (deaths, affected, and injured) when looking at all countries. However, an interesting relationship between the WB LPI and the average amount of affected people could be detected when

analyzing only the countries with average WB LPIs. In this group of countries, the level of logistics performance and the disaster impact correlated with 95% significance according to Spearman's coefficient (Table 7). The results indicated that the higher the logistics performance, the lesser the disaster impact and the lower the logistics performance, the higher the disaster impact when measured as the number of people affected by a disaster.

Table 7 Correlation for low, average, and high WB LPI

	Low LPI	Average Affected	Average Injured	Average Deaths	Average Damage
Spearman's Correlation	1	-0.052	-0.149	-0.143	0.288
Pearson's Correlation	1	-0.083	-0.197	0.017	0.050
	Average LPI	Average Affected	Average Injured	Average Deaths	Average Damage
Spearman's Correlation	1	-0.347**	0.029	-0.044	0.093
Pearson's Correlation	1	0.037	0.032	0.016	0.000
	High LPI	Average Affected	Average Injured	Average Deaths	Average Damage
Spearman's Correlation	1	-0.097	-0.073	0.128	0.476*
Pearson's Correlation	1	0.039	-0.194	0.167	0.512*

(* $p < 0.01$, ** $p < 0.05$)

As a practical implication, increased information sharing of the contextual variables such as infrastructural uncertainty between supply chain members is encouraged. Furthermore analysis of country WB LPI as part of disaster preparedness in areas with high disaster occurrences and low logistics performance is suggested. Also supply chain decisions makers could to a larger extent take infrastructural uncertainties into consideration in the preparedness phase, for example when considering locations for pre-positioning of goods. Wyman (2009) for example optimized the stockpiling of H5N1 taking in consideration infrastructural uncertainties as the WB LPI's.

5 CONCLUDING DISCUSSION

This thesis set out to analyze how supply chain performance is understood in the humanitarian context. The four studies presented in this thesis explored the aim from different perspectives through qualitative and quantitative research. The thesis contributes to descriptive and prescriptive knowledge. The contributions can be articulated on several levels of knowledge, such as the research question, the discipline level, and the practice level, as Arlbjørn and Halldórsson (2010) point out. The following sections discuss the contributions and reflections, followed by the subsections on conclusions, limitations, and future research.

5.1 The alignment (and misalignment) of performance objectives in a humanitarian context

This thesis analyzed how supply chain performance is understood in the humanitarian context. The context is shown to be an important factor in the essays on all types of performance (operational, program, overall humanitarian assistance, and country logistics).

The humanitarian context proved even more complex than how prior research has viewed it. It has been claimed to differ from the common setting of supply chain management by an aspect of uncertainty (Long and Wood, 1995; Beamon, 2004) in terms of timing, location, type, size, and demand. In rapid-onset disasters such as earthquakes, hurricanes, or terrorist attacks, humanitarian organizations struggle with the predicament of demand or needs (Beamon and Balcik, 2008), since in the humanitarian context, demand is referred to as the needs of beneficiaries (Kovács et al., 2010). However, the claim that humanitarian efforts would always be labeled by uncertainty has been criticized by Jahre and Navangul (2011), who argued that uncertainty only exists in sudden-onset disasters, even though the majority of disasters are slow-onset types (EM-DAT, 2013). The research questions are answered in this section the following order; first the last research question RQ4 is answered and misalignments though the contingency theoretical approach are described. Subsequently RQ1, RQ2 and RQ3 are answered.

Essay 4 answered the fourth research question: *What is the link between country logistics performance and disaster impact in the humanitarian context?*

Findings in Essay 4 concluded that a link exists between disaster impact and contextual factors such as country logistics performance, although a weak one. A correlation is found in Essay 4 between disaster impact (when measured as the number of people affected by a disaster) and country logistics performance for countries that are average performers. The findings in Essay 4 further indicate that there are contextual factors influencing the outcome of a disaster, of which one is noted to be infrastructural uncertainty, measured as country logistics performance in Essay 4. Other contextual variables influencing the performance of humanitarian supply chains could be stability of supply, predictability of demand, and security-related factors.

What can be concluded about the humanitarian context in the individual essays is that the distinct division between relief and development aid, and consequently, the distinction between a certain or uncertain environment, is not all-encompassing in presenting all the different scenarios at hand. The humanitarian context can rather be

stated as uncertain, while retaining the notion of stability in demand and/or supply, particularly in contexts that receive more long-term program aid. It can be further stated that the humanitarian context is both uncertain and certain, with possibly a quick shift between these contexts. For example, a refugee camp receiving emergency relief can be stable in terms of time, place, size, and demand for several years (Haavisto et al., 2013), but a sudden flood in the camp can cause a fluctuation in the demand. This idea relates to the contingency theory, because an even stronger and more interactive relation exists between the context and the organization than that suggested by classical contingency theorists (e.g. Burns and Stalker, 1961; Lawrence and Lorsch, 1967). The fit between the organization and the context is important, but by following some suggestions by contingency theory critics (Tosi and Slocum, 1984), the organization seems to influence the context as well. This can occur if a humanitarian organization reaches its goal; thus, an uncertain context can become more certain. Figure 13 shows contingency theory variables based on the framework presented in Chapter 2, with additional findings of characteristics from the studies.

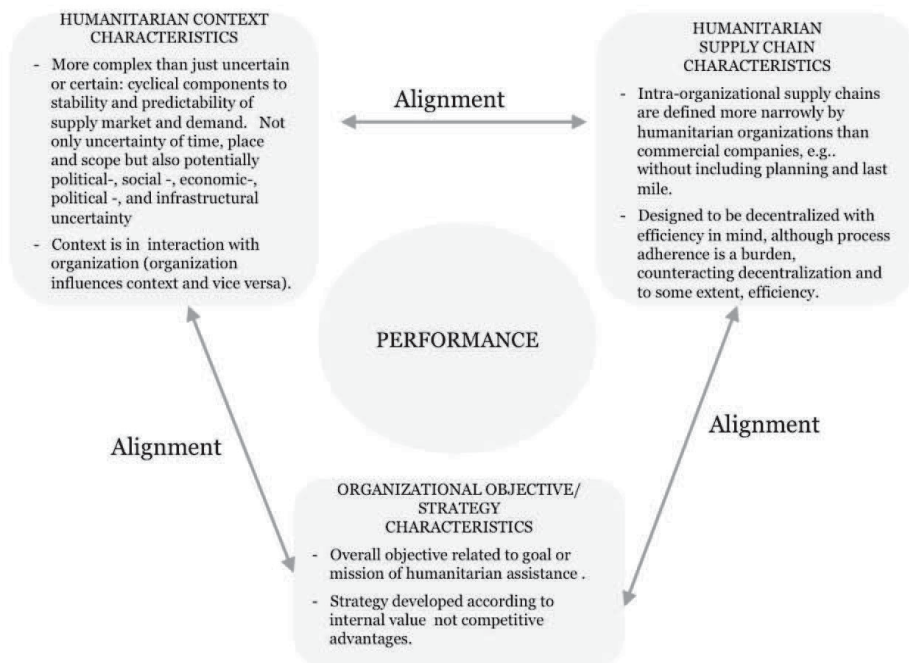


Figure 13 Characteristics of contingency theory variables in the humanitarian context

This strict division into a relief/development and certain/uncertain context also has implications on performance. The goals for each part can differ; that for emergency relief is to save lives, and those for long-term program aid can be economic and social development or related to policy initiatives. These long-term goals are difficult to set and measure (see also Bruderlein and Dakkak, 2010). Humanitarian programs can fall in between these goals; this is reflected in the misalignment of goals on different levels, as noted in Essay 2's findings, and consequently, a misalignment in the assessment of these activities.

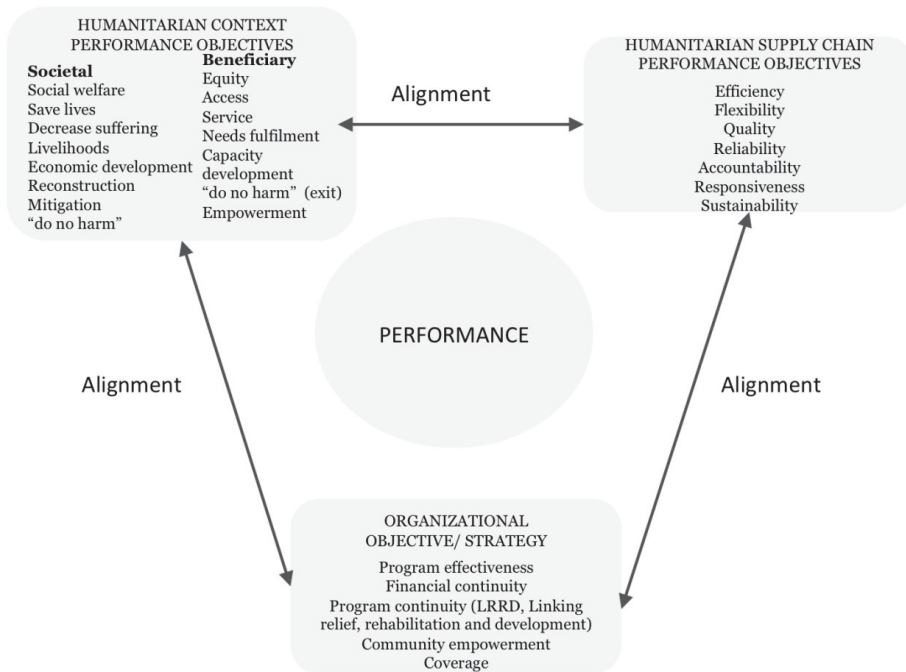


Figure 14 Aligning goals (performance objectives) through a contingency theory lens (Modified from Haavisto and Kovács, 2012)

Building on the contingency framework, Figure 14 provides examples of performance objectives for each variable by combining Haavisto and Kovács' (2012) framework on different understandings of performance with the contingency framework. The humanitarian supply chain performance objectives are based on Brito et al. (2007), Schulz and Heigh (2007), Beamon and Balcik (2008), Blecken et al. (2009), and Essay 1's findings.

The first RQ of the thesis was: *how is efficiency understood in the humanitarian context?*

The findings, particularly in Essays 1 and 2, indicate that efficiency is considered an important performance objective. However, when defined, efficiency does not follow a traditional understanding of productivity (see Slack et al., 1995) but a more comprehensive definition, including aspects of planning, quality, and accountability.

In Essay 1's findings, efficiency was specified as process efficiency (time), doing things once (right the first time), time efficiency (operating within a time limitation, not speed but reliability), and cost efficiency (operating within the expected [budgeted] cost, not a lower cost). Differences in understandings of efficiency between the corporate sector and a nonprofit organization could hence be detected. Where the traditional understanding of efficiency is defined as improving productivity, the understanding of efficiency in the case of humanitarian organizations includes planning, accountability, and quality. Findings further indicate a conflicting understanding of efficiency between

the supply chain staff and other staff (program, finance, and grant). Particularly, these two groups of respondents in the Essay 1 case study stated conflicting priorities among performance objectives. Where the other staff mentioned that the primary objective for humanitarian supply chains should be time efficiency, the supply chain staff cited quality. One notion from the findings in both Essays 1 and 2 is that the planning activity is perceived as a cause of efficiency, that is, if planning is done properly, one can achieve supply chain efficiency.

Planning performance measurements are thus suggested as measuring efficiency in humanitarian supply chains. Planning could be measured as real cost/budgeted or estimated cost, or date of delivery/estimated date of delivery. These forms of planning measurements would also take into account the budgetary context in which humanitarian organizations operate, where cost efficiency is understood as estimated cost, not lower cost, and time efficiency as estimated lead times, not necessarily short lead times. Furthermore, measurements related to planning and planning accuracy function in different phases of humanitarian activity— emergency relief, humanitarian activity in the transition phase, and long-term development activities (see Table 2 for phase division). Planning measures further link the performance objectives of integration and/or collaboration (among internal actors) to those of learning and innovations. If learning has occurred from previous programs or activities, this should be directly reflected as better planning. Furthermore, if internal collaboration or collaboration among supply chain players in humanitarian operations is functioning, this should as well have a direct reflection on better planning accuracy.

The relationship between the goals or the actual impact of humanitarian activity on supply chain performance was further elaborated on through the second research question.

The second RQ in this thesis was: *What is the link between supply chain performance and impact of humanitarian activity in the humanitarian context?*

As the findings in Essays 1 and 2 point out, the ultimate measurement of humanitarian assistance would be indicators that connect the operational performance with the impact. For example, such indicators could measure the quality of the operations that have a direct link to accountability and impact. If the operations are performed using a high-quality process, few mistakes will be made; thus, the outcome will be higher.

Other goals that would link short-term and long-term goals, particularly in emergency aid, would be indicators measuring equity and coverage (Balcik et al., 2011).

Another such measurement would be sustainability measurement, which is a direct link between short-term and long-term goals. This shift from long-term gains (e.g. quality, accountability, and sustainability), ranking high in the organizational hierarchy, to more short-term gains in the actual processes in the supply chain can lead to prioritization difficulties in decision making along the supply chain. The long-term focus on strategy and short-term focus on the processes are common in the commercial sector as well, but should perhaps not be as evident in a nonprofit organization whose actual mission constitutes contributing to development (UNDP, 2013), saving lives (Beamon, 2004;

Kovács and Spens, 2007), and decreasing human suffering (ICRC, 2010), not making profits.

The evaluation reports and impact assessments conducted via M&E of humanitarian assistance seem to focus solely on the aspect of accountability to the donor. This situation occurs, even though the purpose of humanitarian assistance evaluations is supposedly for the benefit of learning (Essay 2; MFA, 2013). As the findings in Essay 1 indicate, some monitoring for learning purposes seems to occur when organizations need to collect information to support decision making and also to gain tacit knowledge more structurally. The findings on performance measurement and any form of M&E and assessment thus support the view of Burderlein and Dakkak (2012), who stated that structured, internal performance measurements (both quantitative and qualitative), as well as ad hoc, undocumented policy are used for learning and development, but program-specific evaluations are not.

The suggestions on performance objectives for the organization on a program and societal level are examples from the findings in Essays 2 and 3. With these examples of performance objectives at hand, Figure 16 aims to visually identify potential alignment.

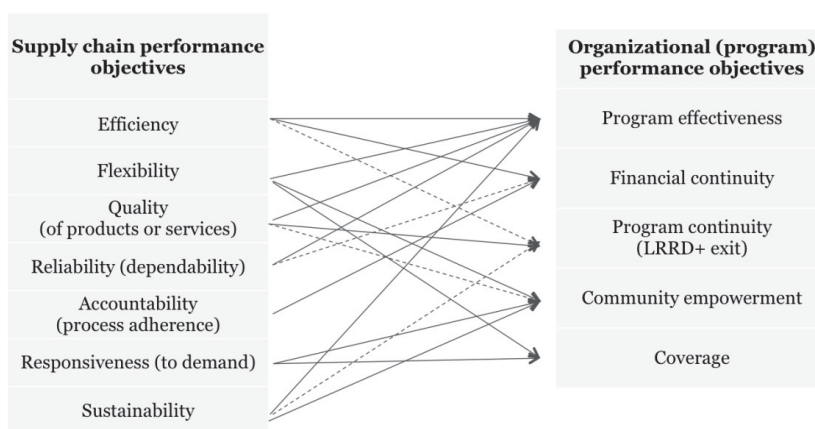


Figure 15 Supply chain performance objectives and organizational performance objectives

As the findings in Essay 2 indicate, multiple versions of a program's expected impact exist. In pursuing a method to detect an alignment or misalignment, Figure 15 portrays how different examples of operational performance objectives support examples of organizational and program goals. The arrows in Figure indicate direct alignments (harmonization and support), and the dotted lines show indirect support. An exercise such as the one shown in Figure 15 demonstrates that when efficiency is defined as cost or time efficiency, it can directly support program effectiveness and financial continuity. Flexibility can directly support program effectiveness, community empowerment, and coverage. Flexible supply chains can be viewed as supporting community empowerment; if the supply chain is decentralized and adaptable to change, it can take local requirements into consideration and empower the local population. It also supports coverage, since in an adaptable supply chain, changes in modes of transportation, distribution points, and timetables can be made to direct resources more easily to beneficiaries' locations and improve access to the services and

supplies. The quality of supplies or services can directly support program effectiveness and continuity, since a high-quality supply or service (e.g. durable construction material or professional teachers) enhances the longevity of the program's outcome and could hasten the ability to turn over the program to the local community. The aspect of accountability, here used as process adherence and control in a supply chain, can directly support financial continuity, since it is a requirement by donors toward donors; however, accountability can indirectly support all other objectives as well. Responsiveness, particularly demand responsiveness, supports community empowerment. This support can be found if the supply chain is responsive in a manner that includes aspects of decision postponement and the determination of the "real need" of the local community and its empowerment to participate in decision making. Furthermore, responsiveness can lead to enhanced coverage if the supply chain targets the "real" need and not a forecasted demand. Sustainability as a final supply chain objective can lead to program effectiveness, while an unsustainable supply chain may have a reverse effect on the program outcome. A supply chain that neglects sustainability aspects can cause harm to the context where the supply chain operates. An example of this was identified in Afghanistan, where water was distributed to beneficiaries in small bottles (IRC, 2012); in a society without any disposal system, this led to a new problem of empty bottles collecting as waste. Sustainable supply chains can also lead directly to community empowerment through local, small-scale procurement activities, for example.

Essay 3 further aimed to understand aspects of sustainability, answering the third research question: *How is sustainability understood in the humanitarian context?*

According to the findings in Essay 3, sustainability was generally understood by organizations through the mitigation of climate change aspects. Hardly any attention was paid to green products, services, or operations, although climate change adaptation was brought up several times (see Essay 3). Sarkis et al. (2001) concluded that humanitarian organizations seemed to focus on helping people, not on green operations. Sustainability as a performance objective could therefore function as an aligning factor among the different levels of humanitarian assistance (overall humanitarian goal, overall organizational goal, supply chain goal, and supply chain processes), and sustainable supply chains could directly support other goals in humanitarian assistance, particularly in long-term development aid, where time and coverage are not essential.

In terms of the contingency theory framework, organizational alignment with the humanitarian context seems crucial for improved organizational performance. Figure 16 shows an alignment between recognized supply chain performance objectives (based on de Brito et al., 2007; Schulz and Heigh, 2007; Beamon and Balcik, 2008; Blecken et al., 2009; Essay 1) and the characteristics of the humanitarian context.

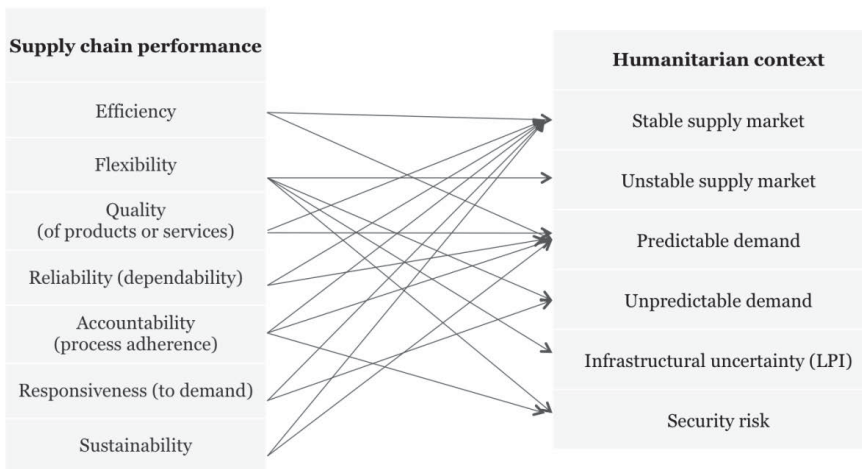


Figure 16 Aligning supply chain performance objectives with characteristics of the humanitarian context

Supporting Fisher's (1997) argument that efficient supply chains "match" stable demand, efficient supply chains here are suggested to align with stable supply markets and predictable demand (Figure 16). On the other hand, flexible supply chains support performance in unstable supply markets where adaptability in procurement processes could be necessary, for example. The procurement processes identified in the process maps in Essay 1 were found to be the most inflexible types; part of the procurement was conducted centrally, and the local procurement was fairly heavily controlled through due diligence and anti-terrorism compliance checks, for instance. Flexible supply chains could also support unpredictable demand and infrastructural uncertainty and could be better suited to cope with risky security situations. A reliable supply chain could support operations in a stable supply market with predictable demand. Accountability, here understood from a supply chain perspective as process adherence and transparency, could support performance in a fairly stable environment but not in an environment with an unstable supply or unpredictable demand, infrastructural uncertainty, or security risk. This is because process adherence requires planning, centralization, or standardization to some extent, which does not work well if sudden changes need to be made. Following Burns and Stalker's (1967) concept of organic structures fitting uncertain environments and mechanic structures fitting certain environments, donors seem to require that humanitarian organizations have mechanic structures to cope with accountability requirements, including transparency, process adherence, and segregation of duties (see findings in Essays 1, 2, and 3). Therefore, donors seem to require contradictory goals from humanitarian organizations. The first goal of accountability is not stated in the goals for humanitarian assistance but was found as an important aspect in the interviews in Essay 1, in the evaluation reports in Essay 2, and in the annual reports in Essay 3. The other goal involves cost and time efficiency. Cost efficiency as a strategy particularly requires a light administrative body that contradicts the accountability requirements. Humanitarian organizations document their own performance in their annual reports by providing the percentages of their budgets used for administrative costs. The funding structure thus seems to lead organizations toward a higher focus on accountability to the donors, as well as on efficiency, without considering how other goals are counteracted. This finding supports

Balcik et al.'s (2010) study on equity, which argued that an increased focus on efficiency can lead to overlooking other goals.

This chapter examined the specific studies' findings through a contingency theory lens, concluding that several misalignments occur in the humanitarian context. Most of these misalignments originate from conflicting goals set by donors.

5.2 Summary of conclusions

This thesis set out to analyze how supply chain performance is understood in the humanitarian context; to do so, throughout its various essays, it intended to help the efforts toward a framework based on the contingency theory in the humanitarian context. Contingency theorists Lawrence and Lorsch (1967), Thompson (1967), and Burns and Stalker (1976) claimed that organizations' performance depends on the fit between different contingency variables (organizational structure and strategy) and the environment. This thesis built on that argument and found that organizational goals can be misaligned on different levels, meaning that conflicting goals are present throughout the levels of humanitarian supply chains. The overall goals of humanitarian assistance are to save lives (Beamon, 2004; Kovács and Spens, 2007), decrease human suffering (ICRC, 2010), and contribute to development (UNDP, 2013). Program-specific goals seem to be related to program effectiveness and the delivery of supplies and services. Humanitarian supply chain performance objectives are focused on efficiency, quality, flexibility (adaptability to change), but further focus on accountability (process adherence and transparency), reliability, responsiveness (to demand) and sustainability is suggested. Sustainability is a supply chain performance objective that can serve as a mediator between different levels of goals and actors, since it pre-imposes long-term thinking. Misalignment among goals can occur, for example, when accountability and efficiency goals are imposed in a humanitarian context characterized by unstable supply markets, uncertain demand, infrastructural uncertainty, and security risks. Findings further indicate that assessments of these different goals and performance objectives are conducted, not for learning purposes as suggested by Caplice and Sheffi (1994), but rather for donor accountability. The misalignments are identified to originate from conflicting goals set and imposed by donors on their implementing partners, the humanitarian organizations.

In this thesis, the framework of contingency theory was found applicable in the humanitarian setting, where understanding the environment and thus the context is essential to the organizational supply chain performance. Nonetheless, the context is not the only important aspect, as the goal-setting theory claims; the internal alignment of goals, performance objectives, and strategies across all actors in the supply chain, particularly the internal actors in a humanitarian organization, are elementary. It means that all the actors involved in a humanitarian supply chain ought to be aware of and convert the overall humanitarian goal to the right level in the humanitarian process in which they function.

There are four specific contributions of this thesis: a theoretical and conceptual, an empirical, a methodological, and a practical.

First, it applies the contingency theory to the humanitarian context and finds that similar to its applicability in research on information technology and in research on how organizations function with temporary structures, contingency theory can help explain how performance is influenced by the fit between humanitarian supply chain,

humanitarian organizational strategy and structure, and the humanitarian context. Explanatory power is thus found from contingency theory in the humanitarian setting. Further the goal-setting theory explains in greater detail the relation between the organizational performance objectives and the performance. Combining goal-setting theory and contingency theory brings in a behavioral aspect into the contingency theory, and consequently deepens the analysis of the organization itself. The performance objective is to be set on the right level for involved actors to give rise to greater performance.

Second, this thesis takes a step back from the humanitarian performance measurement literature and strives to understand the underlying conceptual variables behind the measurement of performance, such as efficiency. One of the criticisms posed towards the applicability of contingency theory was stated by Tosi and Slocum (1984) to be loosely defined concepts. This thesis has taken a step towards understanding the main concepts related to performance in a humanitarian setting and contributed to tightening the conceptual understanding particularly of “performance”, “efficiency” and “sustainability” in a humanitarian setting. The thesis also takes a step forward from the existing performance measurement literature and works toward understanding how operative performance measurements could be aligned with the impact of humanitarian activity.

Thirdly, this thesis has a methodological contribution, through the use of mixed methods and particularly through describing a longitudinal case study in the humanitarian context. So far, longitudinal case studies have not yet been presented in the humanitarian supply chain management literature, most likely due to the relative novelty of research in the field. The fourth contribution is practical and highlighted in section 5.2.1: Implications for practice, which suggests that practitioners could implement measurements that capture the goal at hand and measure with indicators that explain both short- and long-term objectives. “Planning” and “sustainability” are identified as factors that align short- and long term goals.

5.2.1 Implications for practice

This research includes several significant findings. Misalignments are detected among different goals in humanitarian operations and between their goals and processes. These misalignments could possibly be corrected through long-term thinking in short-term operations by considering sustainability aspects throughout humanitarian assistance, for example. Additionally, better communication is necessary to even out misaligned goals and the power hierarchy in humanitarian supply chains, where operations seem to be structured more according to donor requirements than beneficiary needs. One solution to such misalignments can come from enhanced collaboration among the supply chain members and better transparency, particularly between donors and their implementing partners. However, collaboration in humanitarian settings has been shown to be complex. As a result, information technology has been pointed out (Blansjaar and van der Merwe, 2011) to tackle transparency issues, but this sharing would need to be built on increased trust among the partners, as cited by Tatham and Kovács (2012). A suggestion for humanitarian actors is (rather than taking any money they can and having to comply with the corresponding requirements) to be more selective and only apply for and accept money from such donors whose goals and objectives are aligned with those of the humanitarian organizations. The findings, particularly in Essays 1 and 2, indicate that humanitarian organizations could manage and control their supply chains more

strategically (instead of “just” being implementers of others’ decisions) and thus strive to influence aspects of enhanced planning upstream from the supply chain toward suppliers and donors.

This thesis further highlights and questions the top-down power hierarchy in the humanitarian context. Thus it questions the Majewski et al. (2010) suggestion on increased donor control on cost efficiency and rather recommends a shift in focus towards the beneficiary. The efforts should be toward a humanitarian community where the beneficiaries receive their assigned roles as end customers, from both service quality and accountability perspectives. This process could be implemented in humanitarian supply chains by empowering the beneficiaries as decision makers through cash-based assistance, for example, or by already including them as active members in the planning phase of the supply chains.

5.2.2 Limitations

Certain limitations that are the result of the chosen theory and research design are worth mentioning.

First, the main theory applied by this thesis has received some criticism. The organizational theory grew after the emergence of the contingency theory to include aspects of the institutional factor, such as legal systems, belief systems, and norms (Scott, 2003). A new awareness arose about the presence of actual people behind organizational decisions, enabling a whole new stream of research focusing on norms and values (Morgan, 1997). Furthermore, the idea of organizations as parts of a network opened avenues for new theories in organizational research, thus overlooking the contingency theory as a main approach of the organizational theory after the 1980s. The notion of competition took over, where organizations would have to survive with scarce resources. A focus on “ecology” and inter-organizational relationships arose. A new theory of organizational ecology (see Freeman and Hannan, 1989) grew, arguing that it would be more likely that new organizations would arise to meet new circumstances in the environment rather than existing organizations adapting to new circumstances (Scott, 2003). However, the use of the contingency theory in the humanitarian context does not work against any of the above-mentioned developments of the organizational theory. The reason is that competition as such among organizations is not that important in the humanitarian sector, or at least, the rivalry among nonprofit organizations is not equivalent to that in the commercial sector. Nevertheless, following up on Gammelgaard (2004), there is a call for more actor-oriented research approaches in supply chain management research, including human and behavioral aspects.

Another limitation relates to the fairly narrow definition of performance measurement, elaborated on in Essay 1. One assumption in this thesis is that performance can be measured, which indicates that it can be quantified. However, there can be several levels of unstructured data beyond numeric and textual types. Furthermore, performance measurements should not be deemed as static measures that are in place over the long term after having been implemented. This is particularly the case in the diverse humanitarian context, where the organizational structure is suggested to align with the context (see e.g. contingency theorists Burns and Stalker, 1967; Lawrence and Lorsch, 1967) and thus also needs the performance measures (or presentations) to be constantly evaluated and modified.

There are some limitations to the research design approaches as well, as discussed in Chapter 3, section 3.3. Mixed methods can be criticized by default to not lead to good quality research, since somewhat different epistemological stances are required. However, this thesis leans on the position held by Sale et al. (2002) and follows the argument of the world being complex, thus consisting of both interpretivist and positivist phenomena. Furthermore, the choice of writing a composite thesis imposes some limitations. Even though the essays strive to respond to the same aim, they use various data sources that are incompatible, and they have been written during different timeframes. The research focus shifted from an in-depth case study with an intra-organizational scope, to studying macro level data and country-specific performance, resulting in potential inconsistencies in the thesis.

5.2.3 Further research

The notion of performance is an ambiguous term, since it does not specify to whom the performance is delivered. Although different aspects of performance were considered in the thesis, a stakeholder approach, including the voice of the end beneficiary, was not deliberated on and is suggested to be done in future research on humanitarian supply chain performance. The needs fulfillment aspect of humanitarian operations could be studied in more detail, particularly on what the performance, needs fulfillment, and even service are from the beneficiary perspective and how this perspective is aligned with the understandings of the actors providing emergency relief and aid. Concrete suggestions about what empowering the beneficiary in the humanitarian supply chain means for specific processes and activities and their appropriate best practices are called for. Following Tatham and Hughes' (2011) suggestion, the best practices could be sought in other industries such as the medical industry, where performance and its measurement have both efficiency and a client perspective, including measurements such as "well-being" and "quality of life." Such performance objectives that combine both long-term and short-term goals could be sought, for instance, "sustainability" and "service quality". This thesis analyzed performance measurement from the perspectives of the organization, supply chain, and macro-economics; Essay 3 indicated that further research could deepen the understanding of what sustainability and other performance objectives mean, not only from an organizational perspective, but also from the mandate (development aid and emergency relief) and business model (delivering supplies or services) perspectives.

As pointed out in Essay 1, studies could also analyze performance objectives and their role in supply chain decision making and focus on the actual implementation of performance measurement (or presentation), as suggested by Gopal and Thakkar (2011). Furthermore, research could be conducted on what sort of information is needed to support decision making at all levels in organizations and in supply chains to understand whether it is actually quantitative, ongoing performance measures or other forms of presentation that could be the most supportive.

It is also recommended to conduct analysis on the cost, time and effort put into, and the benefits of ongoing performance measurement. Such a study would benefit of being longitudinal and involving multiple actors. If and when the performance is aligned with both objectives and the process and is continuously measured with accurate data, whom does it benefit and how?

Related to the findings in Essay 4, an increased understanding is needed, concerning the contextual factors affecting the outcomes of both disaster impact and impact of the

humanitarian activity. Further research on specific contextual factors such as infrastructural uncertainty, stability of the supply market, security, and development-related factors (including access to basic pre-disaster services, for example, healthcare and education) could increase the knowledge about what linking relief rehabilitation and development (LRRD) could focus on from a program perspective.

Further work is required as well on the gap or misalignment of understandings between “program staff” and “supply chain staff” in humanitarian organizations. As the findings in Essay 1 indicated and supporting Jahre and Heigh’s (2008) findings, further research could be conducted on what this gap comprises and how it relates to performance. Moreover, organizational structures and their influence on performance have not yet been extensively studied to date. Such studies could focus on differences between decentralized and centralized organizational structures, standardization and customization, and their impacts on humanitarian supply chain performance. Inter-organizational and human resource aspects were also brought up as major challenges, particularly in the interviews in Essay 1, which were not deliberated on in this thesis. Thus, studies are called for to understand individual actors and decision making in the humanitarian community.

Lastly, as indicated in Essay 2, the purpose and use of M&E and impact assessments should be further studied. It necessitates additional research on how M&E could best lead to learning and development, instead of accountability. Particularly, it encourages research on how performance measurement, M&E, and impact assessment would benefit the overall goal of the humanitarian action and thus the beneficiary, instead of the donor. Further work is also recommended on how information, gathered throughout the implementation of humanitarian activities, can be better used for planning future programs and operations. Such research could strive to close the loop between the activities at the end of the supply chain (reporting) and in its beginning (planning).

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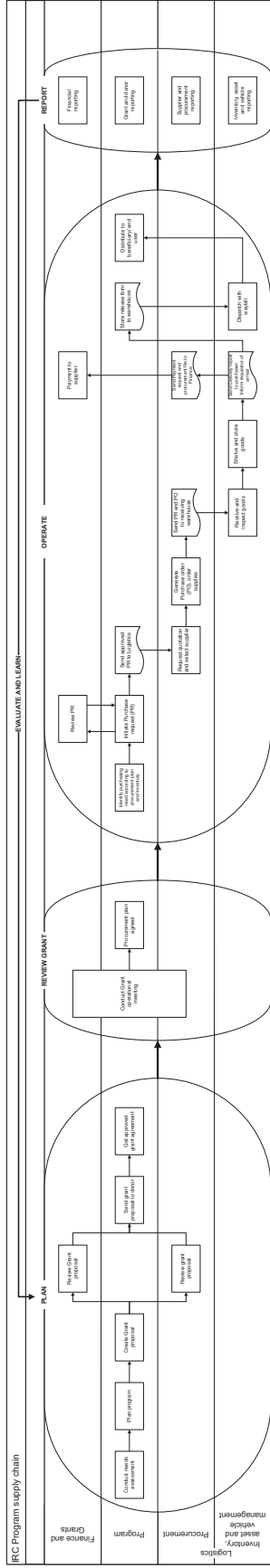
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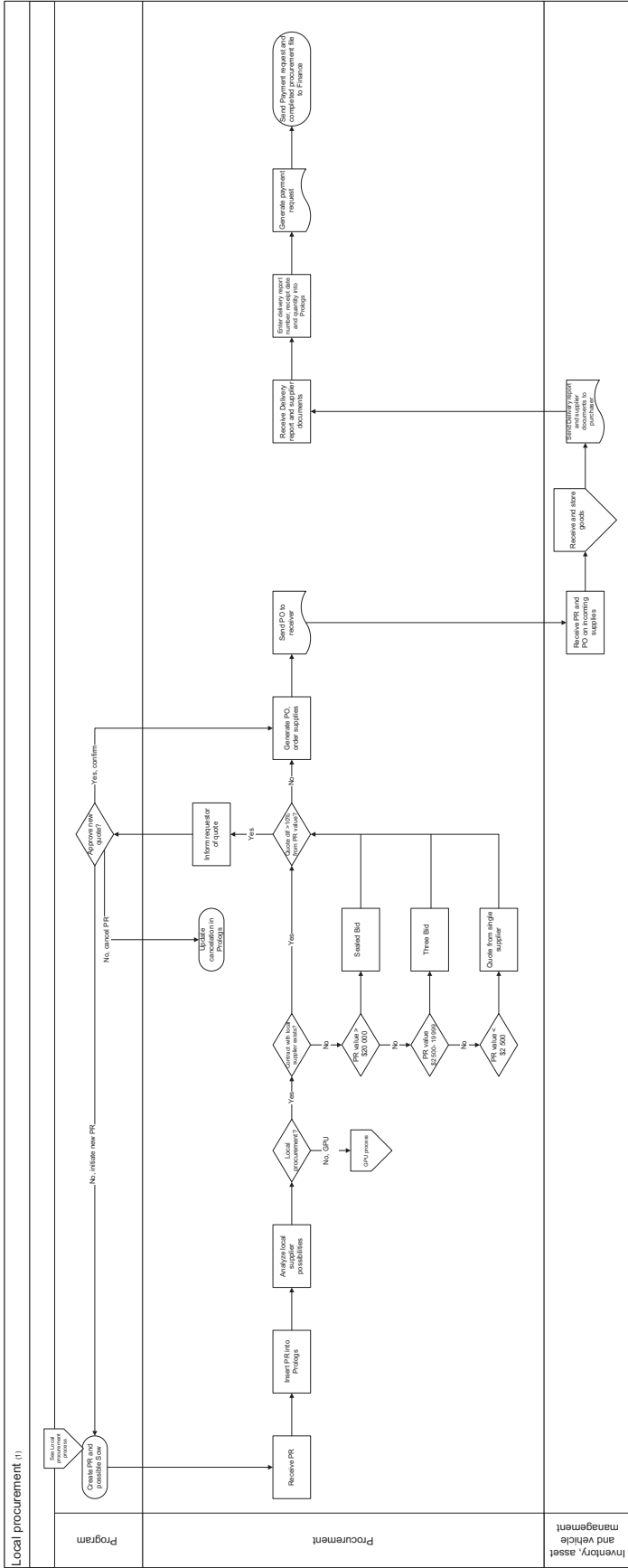
APPENDIX 1 Process maps IRC



REC Programs supply chain

PLAN REVIEW GRANT OPERATE REPORT

Management
Logistics
Inventory management
Stock and equipment management
Grant management
Financials and Grants



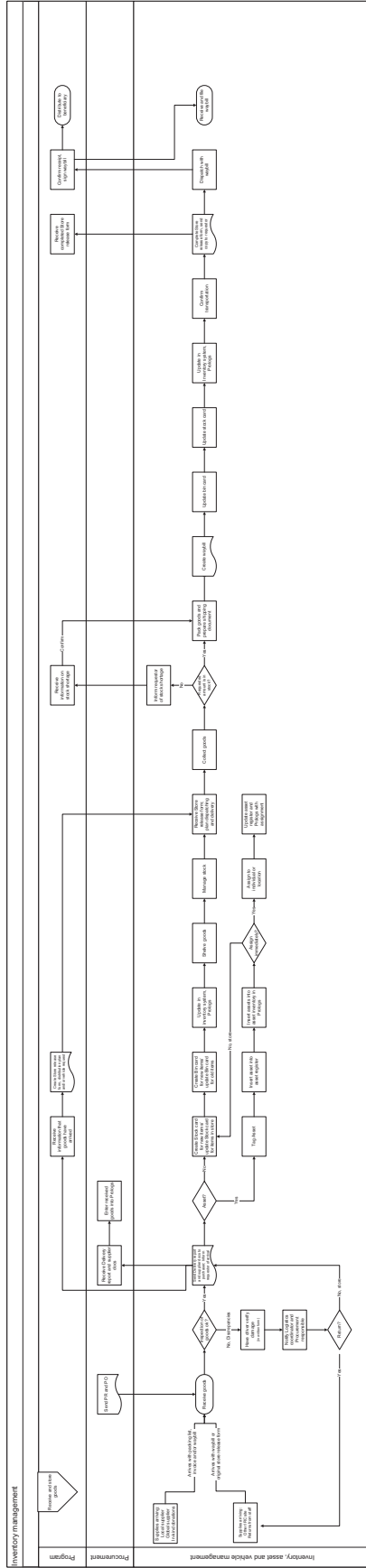
(1) According to Global policy. Check local requirements

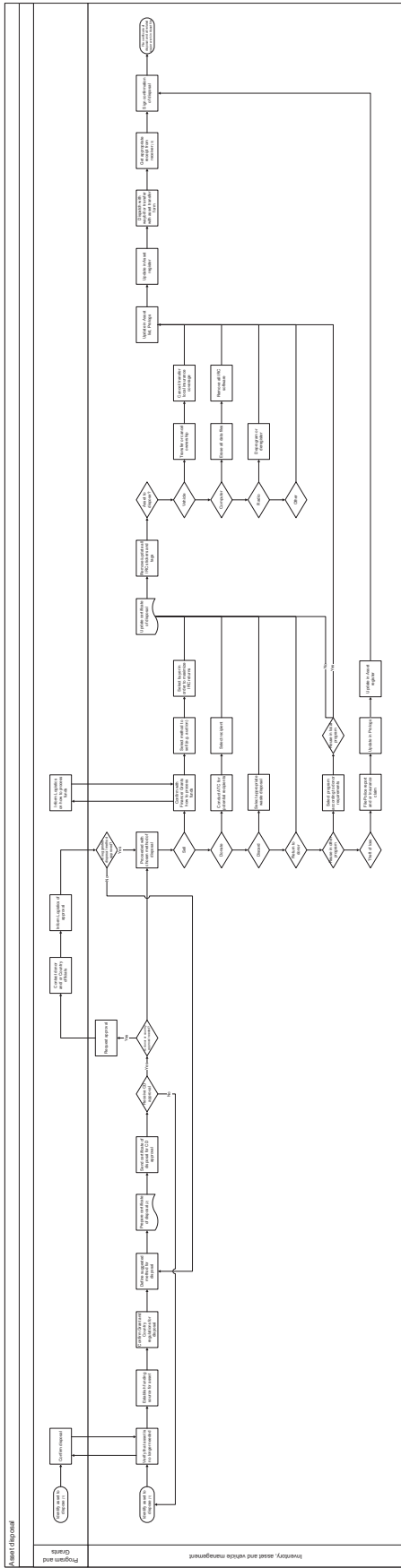
Local procurement (1)

Program

Procurement

Inventory, asset management





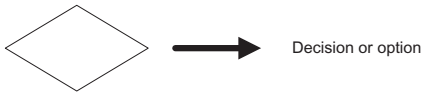
1. The asset is still needed
2. The asset is damaged
3. The asset is obsolete

1. The asset is still needed
2. The asset is damaged
3. The asset is obsolete

1. The asset is still needed
2. The asset is damaged
3. The asset is obsolete

Symbol map.

For additional information regarding IRCs processes please check:
Logistics Procurement manual,
Asset, property and inventory management manual,
Vehicle and equipment management manual.



APPENDIX 2 IRC Interviewees

Phase 1 face-to-face discussions and Skype interviews
Conducted in June, 2010
Discussions with IRC Head quarter's personnel, NY, US:
Deputy Vice President, Field Operations
Field Operations Technical Advisor
Director of Field Operations
Deputy Vice President, Global Procurement
Manager, Global Procurement
Financial Director
Global Grants and Contracts Unit
Global Grants and Contracts Unit
Internal audit Unit
Director, Emergency response
Phase 1 Skype interviews with IRC field staff:
Deputy regional director of operations- Horn & East of Africa
Interim Country Director, Uganda
TA/Environmental Health
Deputy director of Operations- Burundi and Rwanda
Procurement Officer- Sierra Leone
Supply chain manager, Haiti
Procurement Officer, Uganda
Logistics Manager, Kinshasa
Transport officer, Uganda
Operations and Logistics Advisor
Phase 2 Skype interviews with HQ and field staff
Conducted in March, 2012
Director Emergency response, HQ
Deputy Director, Global Supply Chain (GSC), HQ
Roving Logistics coordinator, South Sudan
Deputy Vice President , Global Supply chain (GSC), HQ
Deputy Director Programs, South Sudan
Advisor, Global Supply Chain (GSC), HQ
Internal audit, HQ
Senior Director Global Supply Chain (GSC), HQ
Deputy regional Director Operations WAGYL region
Deputy Director of operations, Afghanistan
Financial controller for Haiti and Côte d'Ivoire

APPENDIX 3 IRC Survey

*** 1. What is your title and where are you located?**

Title:

Country:

Please answer question 2 or 3

2. If you work with supply chain how often do you interact with program staff?

- Daily
- Weekly
- Monthly
- Seldom or not at all

With whom (from program) do you interact most often? Write title please.

3. If you work in program/finance/grants/other operations how often do you interact with supply chain staff?

- Daily
- Weekly
- Monthly
- Seldom or not at all

With whom (from supply chain) do you interact most often? Write title please.

Opinions on supply chain objectives

***4. Please choose below the 5 most important supply chain objectives (the objectives of all IRC logistics activities in NY and field) and rank them according to importance. Give number 1 to the most important objective, number 2 to the second most important, and so forth. Give ranking to 5 objectives!**

Quality (of delivered services or products)	<input type="text"/>
Cost efficiency (as cheap as possible)	<input type="text"/>
Good Communication between supply chain (logistics) staff	<input type="text"/>
Effectiveness (within expected time and budget)	<input type="text"/>
Constant development (of IRC supply chain/all logistics activities)	<input type="text"/>
Quality and accuracy of supply chain process (tasks are conducted as stated in the manual and with good quality)	<input type="text"/>
Accountability towards beneficiary	<input type="text"/>
Time efficiency (as quick as possible)	<input type="text"/>
Reliability of supply chain (tasks are conducted as expected)	<input type="text"/>
Transparency of supply chain process (the way activities are conducted is visible for others)	<input type="text"/>
Good communication between supply chain (logistics) and other departments (such as program or finance)	<input type="text"/>
Accountability towards donor	<input type="text"/>

***5. How well are the 5 objectives (that you stated above) met?**

- Very well
- OK
- Adequately
- Some are met well, some not at all
- None are met well

***6. Do you agree or disagree with the following statements. The main activities of IRC supply chain (IRC field operations) are:**

	Agree, this is a main activity	Agree to some extent	Disagree to some extent	Disagree	Cannot say
Process procurement orders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintenance of fleet and other assets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Responsibility of security	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Handle the inventory (the stored supplies)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Transportation of supplies from supplier to field warehouse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conduct market surveys and find potential suppliers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Constantly develop the IRC supply chain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide IT support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plan the procurement for program activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conduct and/or participate in needs assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Control the quality of the supplies delivered	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Plan the supply chain network (e.g. decide where to keep warehouses and fleet)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inform program staff of potential suppliers and their prices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inform program staff of potential delays for arriving supplies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distribute the supplies to beneficiary	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Report on the supply chain performance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

***7. In your country office, what planning activities do supply chain (logistics) staff participate in?**

	Active and continuous participation	Active but random participation	Continuous but passive participation	Random and passive participation	No participation	Can't say
Needs assessment activities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing grant proposals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing program scope	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Defining program goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing program budgets	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing country year budget	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Construction of procurement plan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grant opening meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grant Mid-term meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grant-ending meetings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Program monitoring and evaluation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Are there other planning activities where supply chain staff participate? And do you think that the supply chain staff should participate more or less than currently in program planning activities? Please specify.

***8. What information would you need (that you don't have) for better planning and decision making in your work?**

9. What is your understanding of quality of operations at IRC, please write below your own definition or explanation of what quality of operations is.

***10. How could the level of quality in IRC operations in your opinion be measured?**

example 1)

example 2)

example 3)

***11. How could the level of quality be improved?**

12. What is your understanding of efficiency of operations at IRC, please write below your own definition or explanation of what efficiency of operations is.

***13. How could the level of efficiency in IRC operations in your opinion be measured?**

example 1)

example 2)

example 3)

***14. How could the efficiency be improved?**

15. Estimate the usefulness of the following KPIs to your own work

	Very useful	Useful	Less useful	Not useful	Don't know
Delivery date accuracy: orders deliver on expected date/ total orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Order accuracy: orders without any mistakes/ total orders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estimation accuracy of procurement cost: actual procurement value/ estimated procurement value	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Logistics expenditure in programs: logistics cost/ total cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX 4 ESSAY 1

Haavisto, I. and Goentzel, J. (Unpublished) “Performance in humanitarian supply chains – uncovering the denotation of efficiency through a contingency approach”.

* Currently under review in an international research journal

Performance in humanitarian supply chains – uncovering the denotation of efficiency through a contingency approach

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Humanitarian Logistics Institute

**Massachusetts Institute of Technology, Cambridge
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Abstract

Purpose: The aim of the study is to deepen the understanding of supply chain performance objectives in the humanitarian context through a contingency approach. Thus, the aim is further to take in consideration the context when analysing humanitarian supply chain performance and to identify indicators that could measure humanitarian supply chain performance.

Design/methodology/approach: The research method for this study is a case study. The data was gathered with mixed methods over a 2-year period. Initial interviews were conducted in August 2010, a second set of interviews in April 2012 and a survey conducted in October 2012.

Findings: Efficiency in humanitarian supply chains is not understood as the traditional productivity ratio, but rather as a function of ‘within expected time and budget’. Furthermore, staff in the analysed case organization relate efficiency to planning, quality and accountability, more so than to time and cost efficiency, although cost and time efficiency seems to be the variables through which to measure supply chain performance.

Originality/value: This is an in-depth case study, applying the contingency approach to study supply chain performance. The study further responds to the public ‘aid efficiency’ discussion by striving to recognise how efficiency is understood and how it can be measured in a humanitarian supply chain.

Keywords: performance objectives, humanitarian supply chains, performance measurement

Article classification: Case study

Introduction

While cost-efficient supply chains are often a requirement by donors (e.g. USAID, 2011; ECHO, 2010), they rarely want to provide funds in advance to humanitarian organizations to cover the cost of planning for these efficient supply chains. Humanitarian organizations are faced with the requirement of efficiency and flexibility of the supply chain not only from the donors, but also from the beneficiary, since efficiency and flexibility are vital - in the form of saved lives (van Wassenhove, 2006). Therefore, efficiency of supply chain (both cost and time efficiency) and flexibility is expected from humanitarian supply chain performance (Blecken *et al.*, 2009). Research conducted on humanitarian supply chains has examined supply chains functioning in the context of an emergency, where responsiveness is crucial and where humanitarian supply chains have been referred to as having the most agile supply chains (Oloruntoba and Gray, 2006). Most humanitarian organizations, however, have on-going operations where there is a supply chain in place responding to more long-term development needs, but where there is room to scale up and down, depending on the needs caused by emergency (Cozzolino *et al.*, 2012).

Due to the context of uncertainty, humanitarian organizations state of their supply chain performance that it is difficult to study applicably, since 'it-depends-on' multiple variables. Pettit and Beresford (2009) strived to identify what these multiple variables on which the supply chain performance is dependent are, through identifying critical success factors of humanitarian supply chains. The identified factors are mostly internal, as for example, supply chain strategy and resource planning. However, Pettit and Beresford (2009, p. 15) concluded that external factors related to the environment have a crucial effect on the performance of humanitarian operations, stating that: *'Whether structural or cultural factors ultimately determine the effectiveness of an emergency supply chain will be depend on the nature and location of the crisis in question'*. Striving to take into consideration also the environment when analysing performance, this study applies a contingency theory approach in the analysis. Contingency theory assumes that performance is not only dependent on the organizations themselves and their strategies and structures but on the environment as well (Lawrence and Lorsch, 1967; Thomson, 1967, Donaldson, 1996). Contingency theorists state that the best way to organise depends on the nature of the environment in which the organization

operates, and that performance is dependent on the ‘fit’ between the organizational strategy, structure and the environment (Donaldson, 2001; Tosi and Slocum, 1984). Humanitarian supply chains are identified to function under uncertain circumstances, with uncertainty of place, time and demand. This study strives to understand how supply chain performance objectives can be developed and measured for humanitarian organizations functioning in such unstable environments. This study strives to answer the following questions:

- 1) *How is supply chain performance understood in the humanitarian context?*
- 2) *How is effectiveness and efficiency understood in a humanitarian organization?*

The aim of this study is to increase the knowledge of supply chain performance objectives and supply chain performance measures in the humanitarian context. In order to understand the concept of humanitarian supply chain performance objective and performance measurement, this study examines the supply chain performance objectives of one humanitarian organization.

Contingency theory in research on supply chain management

Contingency theory was developed originally as organizational theory to provide an alternative for theories suggesting that there is ‘one best way’ to organise and manage (Tosi and Slocum, 1984). The theory was originally presented by Burns and Stalker (1961), Woodward (1965), and Lawrence and Lorsch (1967) with developments by Thomson (1967) and Galbraith (1977). Later, Tung (1979), Scohoooven (1981), and Fry and Slocum (1984) who studied the concept of uncertainty. The concept of uncertainty in the environment is argued to be a summative concept in contingency theory (Tosi and Slocum, 1984). Tosi and Slocum (1984) further studied efficiency as one of the main concepts of contingency theory. Whilst the theoretical foundations were being conceptualised, the theory received criticism regarding what it actually could explain. First, the concept was said not to be clearly defined, secondly the relationship between the concepts were neither specified nor empirically studied (Miller, 1981; Schoonhoven, 1981; Tosi and Slocum, 1984). Thirdly, contingency theory by default assumed that a good fit between the organization and the environment would lead to greater performance. What greater performance is or how performance can be understood by

different actors was not clearly defined, and the relationship between fit and performance did not have/was not shown to have a strong empirical foundation.

Nevertheless, contingency theory was used in organizational research in contexts where uncertainty would play a role and when organization performance needs to be explained by external factors. Further research on supply chain management, particularly on collaboration or IT has applied the contingency theory approach (see e.g. Fawcett *et al.*, 2008; Fawcett and Fawcett, 2012; Buttermann *et al.*, 2007; Ketchen and Hult, 2007).

Performing in the context of uncertainty

Humanitarian supply chains function in a context characterised by uncertainty (van Wassenhove, 2006; Oloruntoba, 2006; Gatignon *et al.*, 2010; Ergun *et al.*, 2010; Beamon and Kotleba, 2007; Blecken *et al.*, 2009; Taylor and Pettit, 2009; Scholten *et al.*, 2010; Chandes and Paché, 2010). Relief supply chains can be said to function in a context of uncertainty in the form of location, type and volume (Beamon and Balcik, 2008), while in the context of more long-term development aid, there can be uncertainty over e.g. available local resources. This unpredictability of need leads, according to Beresford and Pettit (2009), to relief operations being reactive rather than proactive. Private companies can handle unpredictability by improving the predictability of the customers' needs through better communication and advanced information flow. They can moreover reduce response time by increasing the efficiency in their supply chain. For humanitarian organizations, it can be cumbersome to improve the predictability of beneficiaries' needs (Murray, 2005). In most cases, beneficiaries, their location and their needs are unknown, and information sharing in the last mile of a humanitarian supply chain is rare. Humanitarian organizations seldom have either the resources or the time to plan the supply chain (Beamon and Balcik, 2008), whilst the unpredictability of a disaster makes the planning and preparing even more important. The lack of resources to plan and prepare arises from the funding structure as donors rarely want to provide funds in advance of an emergency to humanitarian organizations, for fear of them 'spending the money on heavy administration', instead of saving lives (van Wassenhove, 2006). Longer-term development aid again is funded through program-specific funding (Jahre and Heigh, 2008), and humanitarian organizations' overall performance can be measured by emphasising how little money they have spent on

administration that from a supply chain perspective would include the planning and preparing.

Supply chain efficiency

One of the main concepts in contingency theory is efficiency. A good fit between the organizational structure, strategy and environment should lead to better performance (Lawrence and Lorsch, 1967; Perrow, 1979; Thomson, 2003), which in contingency theory is assumed to be equivalent to efficiency (Tosi and Slocum, 1984). Efficiency in supply chains can be defined by comparing the output and the input, where the variables can be resource-, time- or cost-related. In more detail, operational efficiency can be defined as improving productivity by diminishing input while maintaining constant consistent output (Slack *et al.*, 1995). Efficiency can be measured for an organization by comparing, for example, the actual time or the actual cost of a process with a standard time or cost of that process (Sutheland and Canwell, 2004). Fisher (1997) defined an efficient supply chains as such where there is high utilization level of the supply chain processes, minimum inventory, procurement strategy prioritises cost and quality, and performance is maximised as cost is minimised.

Supply chain performance objectives and strategy

Performance, especially supply chain performance, can be defined as efficiency or effectiveness (Gleason and Barnum, 1986). When supply chain performance or performance objectives are defined and articulated, they can become company or organizational strategy. Although the articulation of a supply chain strategy is claimed to be important for successful supply chain performance, empirical research shows that supply chain strategy is seldom articulated in any company, with research for example by Harrison and New (1999, p. 27) stating that over half of the supply chain strategies in 250 companies were non-existent. Perez-Franco (2010) came to similar conclusions in his research where only 2 out of 20 case companies explicitly had a supply chain strategy stated. Supply chains strategy is nevertheless well covered in research of the commercial sector, where supply chain strategy can be defined to be *'the set of guiding principles, driving forces and ingrained attitudes that help to communicate goals, plans*

and policies to all employees that are reinforced through conscious and subconscious behavior at all levels of the supply chain' (Harrison and van Hoek, 2002, pp. 103).

What might a supply chain strategy look like when it is articulated? Perez-Franco (2001) came to the conclusion in their research that even though the supply chain strategy was articulated by a company, the policy and practices were not necessarily aligned with the strategy. They claim in their research that the articulation of the strategy is imperative for the strategy to 'flicker down' to a tactical and operative level in the company. To get a better understanding of what the performance objective or the supply chain strategy can be, Table 1 identifies common themes such as responsiveness and efficiency (Chase *et al.*, 2001), cost reduction and service improvement (Ballou, 2004). Supply chain performance is often defined as effectiveness and efficiency (Gleason and Barnum, 1986) but can as well be understood as quality, productivity, quality of work life, innovation and profitability/budgetability (Sink *et al.*, 1984).

Table 1. Examples of performance objective themes

Supply Chain performance objective and strategy themes	Authors
Efficiency	Chase <i>et al.</i> (2001); Russell and Taylor (2003);
Flexibility	Russell and Taylor (2003)
Cost reduction, Service improvement	Ballou (2004)
Responsiveness	Chase <i>et al.</i> (2001)
Integration	Heizer and Render (2007)
Quality, Productivity, Innovation, Profitability	Sink <i>et al.</i> ,(1984)

Supply chain strategy or humanitarian organizational core strategy has not been covered much in humanitarian logistics research (Abidi and Klumpp, 2013). The lack of performance measurement in humanitarian organizations has been recognised by both Davidson (2006) and Blecken (2010). In Blecken's (2010) findings, only 20% of humanitarian organizations measure their performance consistently. The challenges for measuring the supply chain performance in a humanitarian setting have been identified in a literature review by Abidi and Klumpp (2013) as: difficulty of obtaining accurate

data, limited information technology, chaotic environment, lack of motivation, potential negative media exposure, human resource issues, general reluctance, conflict between long-term versus short-term goals, and lack of internal recognition of the importance of supply chain management. Performance measurements for the humanitarian sector have been developed (Table 2) where most frameworks (de Leeuw, 2010; Schulz and Heigh, 2009; Moe *et al.*, 2007) are based on the balance scorecard introduced by Kaplan and Norton (1992). However, Davidson (2006) saw the balance score card unfit for the humanitarian sector due to the rigidity of the framework and the complexity of the humanitarian context. Common to most studies on performance measurement in the humanitarian context is the notion of efficiency (Abidi and Klumpp, 2013). Similar findings can be seen in Table 2, where studies on performance measurement acknowledge efficiency either take a cost or time perspective (Beamon and Balcik, 2008; Blecken *et al.*, 2009; Davidson, 2006). If supply chain performance were to be defined in terms of how it is measured in the humanitarian sector, the most common meaning would be financial performance (Beamon, 1999) and time- and volume-related performance (Gleason and Barnum, 1982), with indicators such as lead time and filtrate. While performance could mean the final output and the impact on the society or the environment of the supply chain, this holistic perspective is not much considered in performance measurement of humanitarian supply chains (Haavisto and Kovács, 2012). Furthermore, the broader concept of performance and the expectations of the performance are rarely discussed in humanitarian logistics literature. Research rather directly addresses questions on performance measures and performance measurement metrics (de Brito *et al.*, 2007, Schulz and Heigh 2007, Beamon and Balcik, 2008, Blecken *et al.*, 2009). Performance in humanitarian settings has been suggested to be measured as the output, resources and flexibility (Beamon and Balcik, 2008) or as customer service, financial control and process adherence (Schulz and Heigh, 2009). While Blecken *et al.* (2009) argued that in relief supply chains donation-to-delivery time, the output and resources should be measured, Beamon and Balcik (2008) take into consideration the output along with population coverage or order fulfilment rate. More specifically, the actual measurements are suggested to be: order fulfilment cycle time, supply chain adaptability, asset accuracy, coverage rate, order fulfilment rate, on time

delivery, cost efficiency, resource efficacy and system utilization rate (Beamon and Balcik, 2008; Blecken *et al.*, 2009).

Table 2. Humanitarian supply chain performance

Suggested Humanitarian supply chain Performance Measure from academia	Author
Output	Beamon and Balcik, 2008; Blecken <i>et al.</i> , (2009)
Flexibility	Beamon and Balcik, 2008
Efficiency (resources)	Beamon and Balcik, 2008; Blecken <i>et al.</i> , (2009)
Cost	Blecken <i>et al.</i> , (2009)
Service level (customer/ beneficiary/ donor)	Schulz and Heigh 2009; van der Laan <i>et al.</i> ,(2009); de Leeuw (2010)
Accuracy	Davidson (2006); <i>al.</i> , (2009); van der Laan <i>et al.</i> (2009)
Financial control and efficiency	Davidson (2006); Schulz and Heigh 2009; de Leeuw (2010)
Process adherence	Schulz and Heigh 2009
Time (e.g. donation-to-delivery)	Davidson (2006); <i>al.</i> , (2009)
Coverage, Equity	Davidson (2006); Balcik <i>et al.</i> , (2010)
Utilization	Blecken <i>et al.</i> , (2009)
Innovation and learning	Schulz and Heigh 2009; de Leeuw (2010)
Quality of life and well-being	Tatham and Hughes (2011)

Davison (2006) argued that performance metrics should be aligned with the organizations goals, and further stresses that the measurement system should push the supply chains toward the right goals, pursuing the idea that the performance that is being measured actually improves (see also Caplice and Sheffi, 1999). de Leeuw (2010) focused on the learning perspectives of performance measurement, arguing that more attention should be paid to expanding skills and the implementation and use of humanitarian supply chain performance measurement as key for improving performance. The learning loop is, according to Caplice and Sheffi (1994), one of the main goals for measuring the performance. Organizations such as Oxfam, the Red Cross and IRC have realised that measuring their supply chain performance is not only a necessity for the donor, but if the measurements are analysed useably, they lead to internal development (Oxfam, 2012; RCRC, 2012; IRC, 2010). Furthermore, large donors such as USAid, European Development Fund and the UN request humanitarian organizations to report on their performance through a monitoring and evaluation

(M&E) process. However, the reporting can take up resources in the organization, and humanitarian organizations claim that heavy reporting requirements can counteract requirements for efficiency (IRC, 2010).

Research design: Case study

The research method for this study is a case study. The data has been gathered over a 2-year period, with initial interviews in August 2010, a second set of interviews in April 2012 and a survey conducted in October 2012. The purpose for conducting a case study in supply chain research is to uncover areas for research and theory development or to explore new territory (Seuring, 2005). Case study research can further be argued to be appropriate, especially when studying supply chain management and managerial issues therein, since this method allows for flexible data collection (Seuring, 2005). The purpose of doing case study research can be to identify and describe critical variables (Stuart *et al.*, 2002), to identify linkages between variables, to test developed theories and predict future outcomes or theory extension and refinement (McCarthy and Golicic, 2005). Although criticised for un-generalizability, case studies can contribute to an in-depth understanding of an emerging phenomenon (Meredith, 1993), particularly when conducted as longitudinal studies (Eisenhardt, 1989) and when proper data validation takes place (Mayring, 2002).

Whilst supply chain management is a relatively new research field (Seuring, 2005, Croom *et al.*, 2000), humanitarian logistics is itself an even younger research area (Day *et al.*, 2012) and can therefore be seen as explorative. Since the scope of this study is furthermore on supply chain performance and performance measurements, which are unexplored research areas within humanitarian logistics (Beamon and Balcik, 2008), case study was selected as the appropriate research method. Taking into account the criticism (of un-generalizability) against case study research, this study was designed both to be longitudinal and to use mixed methods. Although this study is a single case study, the data-gathering methods are not only qualitative, but also quantitative, comprising empirical data gathered through a survey in the last phase of the study (see Figure 1).

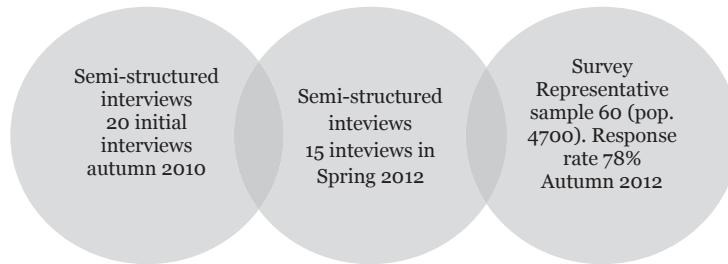


Figure 1. The research process

The study started in the autumn of 2010 with initial in-depth interviews with supply chain managers. Further secondary data was gathered, including an internal logistics survey conducted in 2009, previously mapped process charts, and supply chain manuals (procurement manual, inventory management manual, vehicle and equipment management manual and asset, property and inventory management manual).

In the second set of interviews, the organizational core strategy and the supply chain strategy were studied through a content analysis of the organization's annual report, through analysis of internal documentation stating strategy, in-depth discussions with core supply chain group and fifteen semi-structured interviews with IRC staff (Feb-May 2012). Semi-structured interviews were chosen in this study in order to remind the respondents of the topic but still give as much latitude as possible for the responses. The semi-structured interviews in this study also have an element of the critical incident approach, where respondents according to Fisher (2010) are requested to think of a particular occasion with which they had to deal with.

The data was furthermore gathered with a second data-gathering phase (see Figure 1) in the form of a survey. The survey was structured based on findings from interviews.. As a data gathering method, surveys are a structured form of data collection (Fisher, 2010; Saunders and Lewis, 2012) and are used in the third phase of this study to verify some of the initial findings from the interviews to validate the data through triangulation. The survey was designed with structured questions (tick the box), rankings and open-ended questions, where the respondents could write freely. The survey was designed to verify the initial findings of the understandings of the supply chain strategy and the

performance objectives. The survey sample was chosen as a representative sample of 60 field staff members in the case organization from a population of 4700 IRC field staff. The organisation was requested to choose a sample that would represent equally both staff who work with supply chain related tasks and staff who works with other (grant, finance, program). The organisation was further requested to choose a sample that would cover the hierarchical spectrum amongst the field site staff members. The choice of the individuals included in the sample was left to the organisation.

The overall response rate was 78% (47 responses), out of which the usable responses per question fluctuated between 19 (31%) and 32 (53%). Out of the 32 responses that could be analysed, 11 respondents stated that they were part of the supply chain department in the organization, while 21 stated that they were in another department (grants, finance or program). The following chapters will reveal the empirical findings, starting with an analysis of the organizational strategy and performance objectives and concluding with suggestions for a performance measurement metric for humanitarian supply chains.

The case: International Rescue Committee (IRC)

This study analyses the humanitarian organization International Rescue Committee (IRC). Although IRC do not on their website nor in their annual report state any primary strategy, goal or objective, the organization does state in their annual report (IRC, 2010) that they work towards lasting solutions and building local capacity and self-sufficiency and that the promotion of human rights, participation and accountability is at the core of their programs. IRC (2010) focus their operations on immediate relief but state that they stay in the field ‘as long as needed’, thus both operating with immediate relief and development aid. Although IRC has both immediate and more long-term operations, the organization itself defines all operations as relief (IRC, 2010). The main difference in supply chain processes is identified depending on what sort of program or supply is in question. Medicine and health care programs have to some extent separate processes from the rest of the goods. The organization faced challenges common to humanitarian organizations in designing their logistics processes and defining their supply chain strategy. The challenges are manifested through different internal stakeholder opinions

on the expected supply chain performance and through difficulties in defining performance measurement indicators (IRC, 2010).

IRC supply chain strategy

Unlike most companies (Perez-Franco, 2010; Harrison and New, 1999), IRC actually has an articulated supply chain performance objective and strategy. The supply chain strategy was developed and articulated in Autumn 2011 and launched throughout the organization thereafter. The organization's supply chain strategy had been in place for five months before the interviews in spring 2012 were conducted. The supply chain strategy states that the IRC supply chain should be 'efficient', innovative' and 'integrated'. The interviewees were first asked to state in their own words the overall strategy of IRC (the goal) and then to state what their expectations on IRCs supply chain performance were. Further, the interviewed were requested to state examples of IRC supply chain success and failure. They were in addition shown a picture with IRCs new supply chain strategy and asked to describe each theme in the strategy. Furthermore, the interviewees were asked to state other important themes that were not articulated in the supply chain strategy but should nevertheless be recognised. The understandings based on the interviews appeared fairly unified. The most commonly used definitions of the strategy articulations (efficiency, integration, innovation) and other strategy themes (quality, accountability and reliably) mentioned as important themes are presented in Table 3.

Table 3. Understandings of IRC supply chain performance objective

Strategy	Objective
'Efficiency'	Do it right the first time- on expected time- within budget
Quality (of process)	Service level
Integration	Communication, activity and own initiative
Innovation	Constant development
Accountability	Process accuracy
Reliability	Dependability, Trust, Service level

The supply chain strategy themes for the case organization differ to some extent from the themes brought up in supply chain literature, such as responsiveness and efficiency (Chase *et al.*, 2001), efficiency and flexibility (Russel and Taylor, 2003), cost reduction (Ballou, 2004) and e.g. integration (Heizer and Render, 2007). The common denominator is efficiency. All interviewed agreed that efficiency is the most important objective of the supply chain. Efficiency was specified in the interviews as: process efficiency (time), doing things once (right the first time); time efficiency – operating within a time limitation (not speed but reliability); cost efficiency – operating within expected (budgeted) cost (not lower cost). As stated by global supply chain (GSC) staff member: *'Efficiency is using your resources as effectively as possible, to get the most outcome with the input in terms of money/staff/time. Get more done with the resources you have'* (GSC staff, 2012).

Additionally traditional approaches efficiency were mentioned related to time efficiency, *'Being efficient is carrying out things in a manner where they're done in a time sensitive and drift cost effective way'* (Roving Logistics coordinator); and cost efficiency, *'Most important is time, and timely actually delivery is key element'* (Financial controller, 2012).

Efficiency includes as well the notion of accountability as stated by a regional director: *'To me efficient in this case means that we deliver what we promise at the lowest cost possible and that we do so in a way that is accountable to those who are giving us the money and those who are receiving our services'* (Regional director, 2012).

Furthermore, efficiency in the humanitarian sector can include an element of planning: *'Efficiency comes from planning, I mean you can't be efficient without planning and so that's our focus that's why we're focusing on planning so heavily'* (GSC, 2012). *'Efficiency...I think of...planning,...in South Sudan where always fire fighting and if we can get ahead and be more forward thinking and planning oriented that would be, that would make everyone's life easier...I actually say efficiency is about planning and communication'* (Director for Programs, 2012).

Efficiency was by the interviewees also associated to quality: *'I see is efficiency it looks like it is much related in terms of the function of supply chains, throughout the process of the product or the service from the point of production up to the point of consumption so efficient comes throughout the whole process you use, in another words it is quality,*

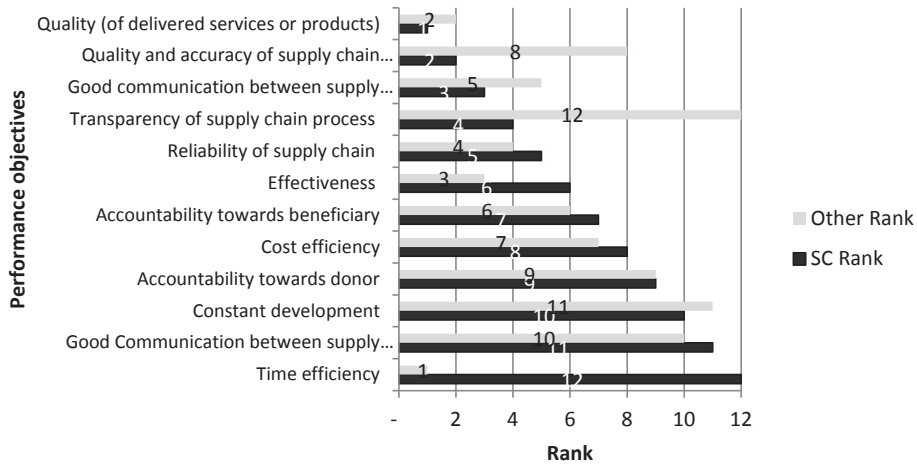
you get a very good quality of a product a service that has been delivered through a very good quality process' (GSC, 2012).

Differences of understandings of efficiency between the corporate sector and a non-profit organization could hence be detected. Where the traditional understanding of efficiency is defined as improving productivity, the understandings of efficiency in the case humanitarian organizations include planning, accountability and quality. This alteration between the sectors was also reflected upon by one of the interviewees: *'I think this is maybe more difficult in the non-profit sector than it is in the private sector...I mean it's really productivity issue and it isn't so much about how many people you can bring on, it could be that given offices, because we got funding, it allows us to have more people. To me it's looking at how things are done and efficiency is how you process something in an effective way. If you look at how many times do you have to do something versus doing it once or doing it right the first time.'* (GSC staff; 2012).

Efficiency was also found difficult to define and even the more difficult was to grasp what measurement thereof could be as pointed out by a GSC staff member (2012): *'Well, being efficient is that everyone has what they want when they want it, that's to me efficiency, but how we measure efficiency? Because with every scenario there will be a left or right hand turn, so it's related to the perception of efficiency, what you class as efficiency maybe very different to what I class as efficiency'* (GSC, 2012).

Lastly, additional themes presented as important performance objectives were quality, accountability and reliability. These objectives were seen as equally important to efficiency. As stated by a staff member in IRC Global Supply Chain staff (2012): *'You could probably argue pretty much anything but accountability should be included'*. Reliability was further viewed as important in the sense that the supply chain should function as expected; if the supply chain is 'slow', it is acceptable if it is known.

Table 4. Ranking of supply chain objectives



The findings from the interviews were verified in the survey in the second data gathering phase (autumn 2012) of the study. The findings in table 4 are sorted according to the chosen ranking by supply chain staff members as the “supply chain rank”. The other legend “other rank” is the group of staff who categorized themselves to work with other than supply chain related tasks such as, finance, program or grants.

Based on previously identified humanitarian supply chain performance objectives (see Table 2) and the conducted interviews questioning the performance objectives, a survey was constructed to further understand the prioritization of performance objectives in the case organization. The survey was targeted both towards personnel functioning under the supply chain umbrella (SC Rank) working with operational processes such as: procurement, fleet management, transportation and delivery, warehouse and inventory management, asset management and internal reporting; and towards staff functioning under the program umbrella (Other Rank), thus being responsible for needs assessment, program planning, program delivery (including distribution), coordination with implementing partners and other stakeholders, and program monitoring and evaluation (IRC manuals, 2012). The respondents were asked to rank performance objectives, chosen based on the interviews conducted in the Spring of 2012. The performance objectives to rank were: quality of product, quality of process, communication, transparency, reliability, effectiveness, accountability towards beneficiary,

accountability towards donor, cost efficiency, time efficiency and constant development (Table 4). The results of a ranking demonstrate that the most important objective is *quality of a delivered product or service*, the next, *quality and accuracy of supply chain process* and the third, *good communication*. More traditional performance objectives such as cost efficiency ranked number 7 and time efficiency ranked number 12. Interestingly, program staff ranked time efficiency as the most important performance objectives, contradicting their supply chain colleagues. Program staff ranked quality as next important joining in on the views of most supply chain staff. This finding of radical differences in views on performance objectives support findings by Jahre and Heigh (2008), who stated that closer internal collaboration between operational program staff is needed. The next sections will present suggestions of measuring the performance objectives identified in the interviews and the survey.

The respondents were further asked to give examples of what a high quality and an efficient supply chain looks like, with the following question: *'In your opinion, what would having a high quality supply chain look like for IRC? What outcomes or outputs would indicate a high quality supply chain?'* The open-ended questions in the survey were voluntary to answer thus this question only received 15 answers. They are presented here as examples on how quality in the supply chain can be viewed by field staff in the case organization. Two respondents defined a high quality supply chain through communication and information sharing between different actors and functions in the supply chain. One respondent defined quality through efficiency, process adherence and donor compliance, as: *'delivering quality services and goods in right quantity, time, place with efficiency and along with donor compliance'* (Supply chain staff, IRC survey, 2012). Furthermore one respondent included the aspect of supply and service quality in the definition: *'Items delivered on time or within a margin that is reasonable; staff communicates well and effectively with other teams; items that are procured are high quality or similar to what was requested'* (Non-supply chain staff, IRC survey 2012). The respondents were furthermore asked to state examples of how supply chain quality could be measured. The most common suggestion of how to measure quality of the supply chain was a measurement of lead-time, but also

measurement such as *'spot-checks on correct documentation'* and accuracy of order and supplies delivered (please see Appendix 2 for all responses).

The same questions were posed to the respondents on what an efficient supply chain look like. Several of the respondents answered *'same as in previous question'*, referring the question about a high quality supply chain. The ones that did answer (14 respondents) stated that an efficient supply chain would be related to time, with responses such as: *'quick turnaround time between request and arrival of goods/services'* and *'timely delivery of goods'* (IRC, non-supply chain staff, 2012). Others related efficiency to process efficiency through IT-tools and integration by stating that: *'I believe that the supply system should be an online system that one can push approvals through without requiring printing of procurement requests. Additionally, I think any supply chain system should link to our finance/accounting system directly. Lessening the time spent and increasing the accuracy of data'* (IRC, non-supply chain staff, 2012). Furthermore, efficiency was, as in the semi-structured interviews, linked to planning activities: *'Efficient participation in needs assessment conduction in identifying of target population needs'* (Supply chain staff, 2012).

The following chapter will further discuss possibilities to measure the supply chain performance in the case organization.

Performance measurement for IRC

The semi-structured interviews in the first phase of data gathering further posed a question of *'What information do you miss that would support you in decision making?'* The same question was asked as an open-ended question in the survey in the second phase of the data gathering. The question was posed as open-ended in survey and could be dismissed by the respondent, thus 20 respondents replied to the question. Out of these, five replied that there was no information they missed or needed, or at least they could not specify what such information would be. The ones who did reply had varying answers. Some supply chain staff respondents requested access to program-specific data, such as budget lines and program plan and more detailed information about grants. Supply chain staff also specified a need for market data, such as information on the

availability of local suppliers. Furthermore, lead time data and exact timelines were requested by such staff that defined themselves as non-supply chain staff, but also supply chains staff requested information about expected lead times on international procurements.

Armistead (1999) argued that performance measurement should be derived from performance objectives and from strategy and that performance measures are a basis for improvement. Performance measurements can both be describing process results from the past and the present, and they can be used to set performance goals (Blecken *et al.*, 2009). They can furthermore allow for a simplified view of complex structures and can be formulated by consolidating quantitative or qualitative information (Armistead, 1999). Performance measurement can be designed to either measure the performance of a whole organization or a single department, unit (Blecken *et al.*, 2009) or function. In comparison to the performance objectives suggested by academia, Table 6 shows the performance objectives that the case organization focuses on. Such performance objectives that could be extracted from the data, either as an articulated strategy theme or as an important performance objective mentioned in the interviews or in the survey, were: *quality, accountability, transparency, reliability* and *integration* (defined as communication). The emergency director of IRC suggested the following measurements to measure IRC supply chain performance: *'The time it takes to procure something, that length of time it takes to release that from our warehouse, the frequency with which we lose stuff in the warehouse, or get damaged, the reliability of our record keeping to make sure that we can account for stuff that come to the fields, the amount of time the cars spend off the road, all those metrics we are using in the supply chain when they do it well, the staff gets reposted'* (Emergency director, 2012).

Performance measurements or particular key performance indicators (KPIs) for the case organization were extracted from the results of aligning the main supply chain processes with the performance objectives. The data was extracted from the results of the survey conducted in phase 2. Main activities and important supply chain performance objectives were combined into a performance and process table (see Table 5). The table entails suggestions for example for how the sub-process of warehousing could be

measured when the objective is to be innovative, integrated and/or efficient? In Table 5, the performance measurements currently in use can be seen through a strategy and process alignment lens.

Table 5. Performance objective and process; IRC KPI's

Performance objectives	Efficiency KPI	Quality KPI	Reliability KPI	Accountability KPI
Sub-processes				
Process procurement orders	Process lead-time/ benchmark	% PRs with mistakes; Estimated/ actual	% PRs with confirmed estimated arrival date	Segregation of duties
Inventory Management (the stored supplies)	Warehouse fill rate/ Warehouse turnover	Warehouse spot-checks conducted; % supplies close to end date	% orders not met on time; #inventory after grant close	% of spot-checks with dif.; value of dif. in spot- checks
Conduct market surveys and find potential suppliers	% of supplies with existing pricelist	%of suppliers with due diligence/ ATC	# of updates in supplier lists/(month/ year)	#of suppliers with due diligence/ ATC
Control the quality of the supplies delivered	value of non 'usable' supplies or assets	% of complaints, returns		Beneficiary 'satisfaction'
Maintenance of fleet and other assets	% of serviceable fleet	% of serviceable fleet; # of accidents	Availability of fleet	% of Reuse of fleet in other programs
General Supply Chain	SC cost (inc. personnel)/ total program cost; Process lead-time	Perfect order rate (% of complaints/ returns)	% orders met on time (e.g. with 1-5 days margin)	Internal audit (/better than last time or regional benchmark)

The suggestions in Table 5 are thus adding to the literature of performance measurement (Schulz and Heigh 2009; van der Laan et al., 2009; de Leeuw, 2010; Beamon and Balcik, 2008; Blecken *et al.*, 2009; Davidson, 2006) in humanitarian supply chains, with performance objectives of reliability, quality and accountability, suggestion that these be measured though for example 'orders met on time', 'perfect order rate' and 'beneficiary satisfaction' or 'segregation of duties'.

Discussion

What can additionally be stated is that the organization, after the completion of the data gathering and initial suggestion of measurements as seen in Table 5, put into use first eight and then three performance indicators across their supply chain. Thus, gathering monthly data for the three chosen indicators from all their field offices. The performance indicators presented in Table 4 are presented again in table 6, since they highlight the difference between academic conclusions and decision making in practice.

Table 6. Case study performance indicator

CATEGORY	PERFORMANCE INDICATOR
Assets	% of assets beyond repair
Fleet	% of fleet within expected fuel consumption rates
Fleet	Out of service vehicles vs. # overall fleet
Grants	% of grants that have a documented procurement plan
Inventory	% closed grant inventory
Procurement	% of procurement via Authorised Suppliers
Procurement	Overall procurement cycle time
Training	% of new non-SC staff that receive SC orientation within first month on the job

The organization chose to measure their *fuel consumption rate*, *close grant inventory* and *overall procurement cycle time*. Informal discussions (that were also recorded) were held with the IRC global supply chain group after the three performance measurement indicators had been ‘rolled out’ to the field staff as required reporting. This discussion revealed the case organization took a bottom-up perspective in the form of ‘what data do we have available’ thus considering Caplice and Sheffis’ (1994) criteria on availability and cost-benefit when choosing the measurement indicators. Only such data that does not take long to ‘put together’ (IRC GSC, 2013) was chosen. Further, the measures that were chosen relate mostly to a process adherence and cost and time efficiency objective, none of which were stated as a strategy or performance objective to prioritise in the interviews or in the survey. This could be reflected upon from the perspective that perhaps there is a stronger cost efficiency objective also when delivering humanitarian aid, although that cannot be said to be a strategy due to the overall social goals. Alternatively, the other way around, the indicators are not in place to measure the objectives, but are rather in place for control or accountability and process adherence reasons. Or, the conclusions to be drawn are not that analytical, but simply that these indicators were chosen based on the data that could easily be extracted by the field offices. What ought to be reflected upon by academicians is that practitioners in this case took a decision of measuring their performance with indicators not directly linked to the strategy. Perhaps there are some variables in Caplice and Sheffis’ (1994) characterization that organizations weight more than others, or a conclusion could be that the top-down, bottom-up approach is not that applicable in a

humanitarian setting since it does not take in account a situation where there would be no data at all easily available.

One assumption in this study is that performance can be measured, which indicates that performance can be quantified. However, there can be several levels of unstructured data beyond numeric and textual data. The suggestions of how to measure supply chain performance are in this study mostly quantitative measures, due to discussions with the case organization indicating that the gathering of qualitative data would be too resource-intensive and thus not supporting Caplice and Sheffies (1994) performance measurement criteria of cost-benefit. However, the share of unstructured data use in decision making is growing rapidly, both in relation to data and in absolute terms (Lempinen, 2013). This growing interest in performance management and ‘presentation’ of performance instead of ‘measuring’ the performance could fit well in the humanitarian context where the broader goals are social, not only economic. Furthermore, performance measurements ought not to be thought of as static measures that are in place long term after having been implemented. Particularly in the humanitarian context that is uncertain, where the organizational structure is suggested to align with the context (see e.g. contingency theorists Burans and Stalker, 1967 and Lawrence and Lorsch, 1967) and thus need also the performance measures (or presentations) to be constantly evaluated and modified. However, the purpose of measuring performance for the case organization in this study was stated to be, to be able to base decisions on data, not anecdotal evidence (IRC, GSC, 2013), and to have access to shared knowledge across the supply chain. The purpose from the case organizations side of measuring the performance, agrees with initial findings by studies (Brynjolfsson *et al.*, 2011; Lempinen, 2013) that show that data-driven decision making actually improves the performance. Other studies claim that the increased quantity of information and feedback available for decision making through, for example, information technology can lead to information overload and reduce rather than increase the relation between performance measurement and learning.

Conclusions

This study strove to understand what are the different understandings of performance objectives, particularly of efficiency in humanitarian supply chains functioning in a context of uncertainty, and how that performance can be measured. This two-phase case study showed that understanding performance objectives for a humanitarian organization is difficult. The reasons are to some extent related to the subjectivity of organizational performance objectives, since they change over time and can be perceived differently depending on the viewer. However, this in-depth case introduces and applies a top-down, bottom-up method to analyse organizational performance for a humanitarian organization. The study further contributes to the current humanitarian logistics research area by raising the question of understandings of performance objective, since only performance measurement from a theoretical standpoint has been discussed so far in humanitarian logistics literature (e.g. Beamon and Balcik, 2008; Blecken *et al.*, 2009, Schulz and Heigh 2009; van der Laan *et al.*, 2009; de Leeuw , 2010).

In terms of performance objectives in the humanitarian sector, what could be observed from the data was that efficiency is considered an important performance objective, but, when defined, efficiency does not follow a traditional understanding of productivity (see Slack *et al.*, 1995) but a more comprehensive definition including aspects of planning, quality and accountability.

This shift from long-term gains (quality, accountability and sustainability) high in the organizational hierarchy to more short-term gains in the actual processes in the supply chain processes can lead to difficulties when prioritization in decision making. The long-term focus in strategy and short-term focus in the processes is common in the commercial sector as well, but should not perhaps be as evident in a non-profit organization where the actual mission is to contribute to development (UNDP, 2013), to save lives (Beamon 2004, Kovács and Spens 2007) and decrease human suffering (ICRC 2010), not to make profit.

Further studies could analyse performance objectives and their role in supply chain decision making. Research on performance measurement again could, in further studies, focus on the actual implementation of performance measurement (or presentation) as also suggested by Gopal and Thakkar (2011). Furthermore, research could be conducted on what sort of information is needed to support decisions making at all levels in organizations and in supply chains to understand whether it is actually quantitative on-going performance measures or other forms of presentation that could be the most supportive. Further, the link between supply chain performance objectives and the organization goal and humanitarian mission should be analysed; likewise, the relation between the output and or outcome of the supply chain process and the overall impact of the operations could be explored.

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Appendix 1. Interview guide for semi-structured interviews spring 2012

A) BACKGROUND

What is your role at IRC?

Where are you currently posted?

How long have you been working in the humanitarian sector?

B) OPINION ON IRC SUPPLY CHAIN

What would you say is the overall objective of IRCs operations?

What would you say is the goal of the supply chain (logistics) in IRC?

What do you think is good about the IRC supply chain (supply chain design/ logistics functions) at the moment?

Do you have an example on when the supply chain has been performing well?

What do you think is 'not that good' about the supply chain?

Do you have an example of when the supply chain has been performing badly?

How would you like to change the supply chain (the setup of the logistics activities)?

C) OTHER OPINIONS ON SUPPLY CHAIN PERFORMANCE

How do you think that the expectations of the IRC supply chain performance vary across the organization?

What do you think are the donors' expectations of IRC supply chain?

What do you think are the beneficiary expectations of IRC operations?

D) MEASURING THE SUPPLY CHAIN PERFORMANCE

What sort of information do you need to take decisions in your work?

What sort of information would you need to be able to plan?

How would you like to see the field operations be measured and monitored (from H&Q)? How would you like to see the field operations be measured and monitored by the donors?

E) IRC SUPPLY CHAIN STRATEGY:

What are your opinions on the IRC supply chain strategy? (look at Figure 2)

How would you say that the strategy of efficiency is implemented in the IRC supply chain/ IRC operations?

What other supply chain performance objectives are there?

What do you think is the most important objective, the least important?

Appendix 2: Responses

Table A2.1. Responses to questions 10 and 11 in IRC survey conducted Autumn 2012

How could supply chain quality be measured?	How could a efficient supply chain be measured?
Post-project monitoring and evaluation	Good quality impact of implemented project
Lead times (mentioned by 7 respondents)	Time it takes to receive goods/services
Timeliness of deliveries	Speed
Through procurement tracking	Through Procurement tracking
Procurement	Reliability
Reliability	Lead time (mentioned by 4 respondents)
How does cost (of supply/ service) paid by IRC relate to 'market cost'	Quality of goods/services procured (mentioned by 2 respondents)
Value of materials purchased and their quality.	IRC and donor compliance
Quality of products for end user	Correctness of orders placed
How often Supply Chain share warehouse reports	A to Z transparency for staff, donors and beneficiaries
IRC policy and Donor Compliance	Transparency
Efficiency and effectiveness	Quality(mentioned by 2 respondents)
How does cost (of supply/ service) paid by IRC relate to 'market cost'	Ensuring that quality and cost effective services and products get to the beneficiaries
Follow up on procurement requests	Data accuracy
IRC policy and Donor Compliance	cost effectiveness
Consistency	Accountability
How quickly logistics (SC) notify requestors on arrival of their materials in warehouse	
Updated asset reports and replacement plans.	
For IT related activities, supporting internet services and regular IT technician training staff on basic computer handling skills ex. virus scanning/reporting, data back-up, etc.	
Getting the job done/ service	
Accountability	
Post-distribution monitoring to capture beneficiary satisfaction with the quality of items distributed	

APPENDIX 5 ESSAY 2

Haavisto, I. (Unpublished), “Aligning humanitarian operational performance measurements with impact assessments”.

* Currently under review in an international research journal

Aligning humanitarian operational performance measurements with impact assessments

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Hanken School of Economics
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ABSTRACT

Purpose

This study uses goal-setting theory to identify forms of assessments for humanitarian assistance and the measurements (indicators) in use and to understand how different forms of assessments are aligned.

Design/methodology/approach

This qualitative study analyses evaluation reports published in 2012 for programs that received donations from the Ministry for Foreign Affairs of Finland. Monitoring and evaluation reports are analysed using structured content analysis.

Findings

The initial findings show that in spite of similarities in the process and content, internal performance measurement, monitoring and evaluation are not aligned. The measurement content is somewhat equivalent, although the information is gathered from different sources. Internal operational performance measurements rely on operational data, such as delivered and stored supplies, while the monitoring and evaluation data come from sources such as program plans and budgets. The findings indicate that a gap exists between operational activities and program activities, which can lead to duplications of effort.

Research limitations/implications

The research scope is the monitoring and evaluation of programs supported by one national donor, the Ministry for Foreign Affairs of Finland.

Practical implications

Rather than focusing efforts on developing rigid, resource-heavy, program-specific evaluations, the humanitarian community could strive to align the different forms of assessments (operational performance measurement, program monitoring and evaluation, impact assessment) and build reporting and information sharing for learning purposes primarily.

Originality/value

This paper is the first study that combines academic literature on humanitarian operational performance measurements with developmental study literature on monitoring and evaluation using a goal-setting theory.

Keywords: Humanitarian operation, Humanitarian assistance, Humanitarian aid, Humanitarian relief, Impact, Impact assessment, Monitoring and evaluation, Performance measurement

1. Introduction

Evaluation is: *"The systematic and objective assessment of an on-going or completed project, program or policy, its design, implementation and results. The aim is to determine the relevance and fulfilment of objectives, development efficiency, effectiveness, impact and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process of both recipients and donors."*

(The Organisation for Economic Co-operation and Development, OECD, 2013)

For most donors and humanitarian organisations, evaluation and performance measurement play a central role in the quest for efficiency and transparency in humanitarian assistance (Burderlein and Dakkak, 2010). Large donors, such as the European Development Fund and the UN, request implementing partners to monitor and evaluate their programs and measure their operational performance (Haavisto and Kovács, 2012). The required reporting uses organizational resources, and staff claim that the heavy reporting requirements can counteract other donor requirements, such as efficiency. Meanwhile, organizations such as Oxfam (2012) and The Red Cross (2011) have realized that measuring internal processes can lead to internal development. Much like practitioners, researchers recently begun paying attention to operational performance measurement and several performance measurement metrics have been developed (de Brito *et al.*, 2007; Schulz and Heigh, 2007; Beamon and Balcik, 2008; Blecken *et al.*, 2009). Performance measurement in a humanitarian setting can be defined in various ways, but studies generally include measures of effectiveness, efficiency, workload and productivity measures (Ammons, 2002; LeRoux and Wright, 2010). Operational performance measurement can be developed and used for internal purposes: for improvement (Kaplan, 1990); for decision making (Gunasekaran and Kobu, 2007; Long, 1997); to increase transparency in supply chain and logistics processes (Gunasekaran and Kobu, 2007); and for learning and development goals (Caplice and Sheffi, 1994). In the research on performance measurement in humanitarian operations, a call has arisen to further link the measurements to the actual outcome or impact of the humanitarian operation (Blecken, 2010; Beamon and Balcik, 2008). Packard (2010) and Plantz, Greenway and Hendricks (1997) argue that the

outcome measurements are a trend among humanitarian organisations, in which outcomes are measured instead of priority using measures of input, throughput and outputs. This request to measure the outcomes on impact is also put forward in donor requirements on evaluating humanitarian programs. Impact evaluations are generally understood as a “systematic effort to identify the effects of activities on individuals, households, and institutions attributable to a policy or program” (Blomquist, 2003). However, assessing impact is a difficult exercise. Challenges exist in measuring impact in humanitarian emergencies due to difficult circumstances and a priority on saving lives before setting up structured reporting structures; challenges are also seen in longer term development aid with policy initiatives. Evaluations of policy initiatives can be cumbersome since the programs can be complex with long-term political and social progress goals (Bruderlein and Dakkak, 2010). In spite of the difficulties, humanitarian actors (donors, implementing partners) strive to improve the accountability and quality of their actions through elaborate evaluation, codes of conduct, humanitarian standards, guidelines, handbooks and other related material (e.g. The Active Learning Network for Accountability and Performance in Humanitarian Action, ALNAP and The Spheres project).

This study uses goal-setting theory to identify forms of assessments for humanitarian assistance, identify what measurements (indicators) are in use and understand how different forms of assessments are aligned. The primary method used in this study is conceptually identifying different forms of assessment for humanitarian assistance and, a through structured content analysis on evaluation reports identify the actual measurements and indicators in use.

2. Research design and method

This qualitative study analyses impact assessments in the form of monitoring and evaluation reports for programs that received donations from the Ministry for Foreign Affairs of Finland and that were evaluated in 2012. The monitoring and evaluation reports are analysed through a structured content analysis. Content analysis was chosen for this study since a relatively vast amount of data is available on the subject of impact assessments for humanitarian assistance and content analysis is objective, systematic,

quantitative and reliable when studying published texts (Krippendorff, 1980). Content analysis has previously been used in humanitarian logistics research to, for example, evaluate the skill requirements of humanitarian logisticians (Kovács and Tatham, 2010) and to analyse current humanitarian logistics literature (Kunz and Reiner, 2012). Content analysis can be used to reveal trends and key ideas in text (Spens and Kovács, 2006). Seuring and Gold (2012) describe four important steps in content analysis: material collection, descriptive analysis, category selection and material evaluation. For this study, the material was evaluation reports published by the Ministry for Foreign Affairs of Finland in 2012. A scope of one donor was chosen to obtain a more in-depth understanding of the impact assessment. The in-depth understanding of the actual impact assessment processes is crucial in this study since the purpose is to understand how operational performance measurements could be aligned to impact assessments. Therefore, it would not have been beneficial in this explorative study to analyse several different impact assessment processes. The scope of the Ministry for Foreign Affairs of Finland was chosen since its course of conduct for humanitarian assistance was recently updated (Humanitaarisen avun linjaus, 2012). The course of conduct includes specifications on measuring efficiency, effectiveness, the impact of humanitarian assistance and what the impact assessment process should entail. This donor was also chosen since it supports different forms of humanitarian action, including bilateral aid given directly to governments and aid through implementing partners, such as humanitarian organisations or Non-governmental organisations (NGO), in the form of long-term development aid programs and humanitarian relief efforts. A content analysis on impact assessment publications in the form of public evaluation reports is performed. The content analysis focused on two topics: the process of the impact assessment and the quantitative and qualitative measurements in use.

3. Goal setting and performance management in organisations

The mission of humanitarian assistance is to save lives, decrease human suffering (Sphere, 2011) and to reduce poverty (United Nations Development Program, UNDP, 2013). This could also be considered the overarching goal of humanitarian assistance. The importance of setting goals for actions or for organisations was theorized in the 1960s by Edwin Locke (1968), who stated that by setting (measurable) goals, the

performance of an organisation is enhanced. According to Locke (1968), a goal is the aim of an action that one consciously desires to achieve or obtain. Goal-setting theory consequently suggests that a conscious goal will regulate behaviour (Locke, 1968; Locke and Lathman, 1990). Goal setting theory has been implemented in the humanitarian sector by researchers including Duke and Long (2007), who attempt to predict success in “achieving sustainable agricultural systems in developing communities”. The weaknesses of the goal-setting theory have been noted by Lathman (2004), who argues that enhanced performance outcomes cannot be achieved if two or several goals are set at the same time since a focus on one goal may lead to difficulty achieving another. According to Lathman (2004), an example of trade-offs between goals can be “quantity versus quality”. Another weakness of the theory was found in a study by Knight, Durham, and Locke (2001), in which the participants in the study ignored other aspects of their job since they focused so intensely on the set goal. The same effect has been identified when goals are being measured. In operational performance management literature, the effect of individuals being too focused on one goal, thus leading to a blurred understanding of other goals, is known as dysfunctional behaviour (Bourne *et al.*, 2003; Caplice and Sheffi, 1994). While goal-setting theory explains the relationship between goal-setting and performance, performance management strives to explain the relationship between goals and the strategic management of activities and performance towards these goals (Lempinen, 2013). The following section will present recent research on performance management and measurement in the humanitarian context.

4. Measuring organisational operational performance in a humanitarian context

Humanitarian organisations collect data about their performance for internal and external purposes. The largest humanitarian organisations have internal performance measurement metrics in place to measure their on-going performance (Oxfam, 2011; The Red Cross, 2011). Although larger organisations have tools in place for on-going measurements, getting data from the field, having resources to analyse the data and transforming the data into meaningful information has been identified as a challenge in implementing performance measurement metrics in a wider range in the humanitarian community. Abidi and Klumpp (2013) identify challenges in measuring operational

performance in humanitarian settings as difficulty obtaining accurate data, limited information technology, chaotic environments, lack of motivation, potential negative media exposure, human resource issues, general reluctance, conflict between long-term versus short-term goals and lack of internal recognition of the importance of supply chain management. These difficulties can be seen in the lack of performance measurements used by humanitarian organizations. Blecken (2010) concludes that only 20% of humanitarian organizations measure their performance consistently. In spite of the practical challenges, several performance measurement frameworks for the humanitarian sector have been developed (de Leeuw, 2010; Schulz and Heigh, 2009; Moe *et al.*, 2007; Davidson, 2006; Beamon and Balcik, 2008; Blecken *et al.*, 2009; Gleason and Barnum, 1982; Schulz and Heigh, 2009). Suggested measurements in these frameworks include donation-to-delivery time, population coverage, order fulfilment rate, order fulfilment cycle time, asset accuracy, on-time delivery, cost efficiency, resource efficacy and system utilization. All the studies mentioned above discuss the dilemma of measuring input or output. Abidi and Klumpp (2012) conclude that it is more common for non-profit organisations to measure input than output. Beamon and Balcik (2008) take these suggestions further by assessing actual impact of operations and suggesting an outcome measurement in their performance measurement framework. The literature on operational performance measurements can be summarized by identifying three themes: the practical challenges of measuring performance in a highly uncertain humanitarian context (e.g. related to destroyed information and communication systems); the diffusion of operational goals (e.g. efficiency, responsiveness, quality and reliability); and the call for streamlining or standardising performance measurements to ensure comparability and reduce the use of resources in data gathering. These challenges have also been put forth by Tatham and Huges (2011), who call for the development of better outcome and effectiveness measures.

5. Measuring program output and outcome

Measuring humanitarian assistance can serve numerous functions, but the main function is to ensure that humanitarian assistance has been carried out as intended and has produced the desired results. Assessment of humanitarian assistance is generally carried out through an intervention. The actual measurement of the desired results begins in the

planning phase by defining a baseline indicator. A baseline indicator reflects the current status of the situation and therefore depends on a conducted needs assessment. A baseline indicator could be, for example, the percentage of illiterate children in an area or the amount of people with no access to clean drinking water. The baseline indicator can serve as the reason for intervention and can therefore be the benchmark to measure the results against. Haims *et al.* (2011) defines a baseline as the “information collected before or at the start of a project or program that provides a basis for planning or assessing subsequent progress and impact”. Performance measurement in a humanitarian context can be related to the implementation of the programs (input, process, output indicators) and the results of the programs (outcome and impact indicators) (Cozzolino, 2012) and shows the causality between the action and its ultimate impact (Tatham and Huges, 2011; Hofmann, 2004; Roche, 1999). When measuring the performance of humanitarian assistance, evaluations are requested by several donors to follow a rigid hierarchy of objectives following either the logical framework approach (Drifmeyer, 2004; Ministry for Foreign Affairs of Finland, MFA, 2013) or the results chain (Roche, 1999), which have an alignment of the activities to results in common. It is often suggested that programs be assessed according to Figure 1, with a pre-defined baseline and all subsequent actions linked to that baseline.

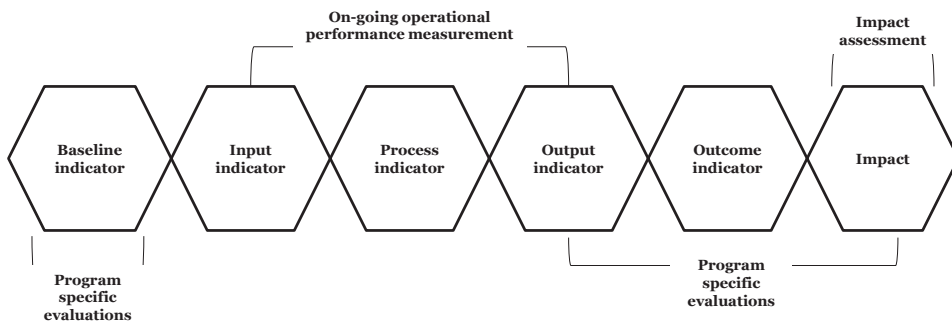


Figure 1. Program evaluation, modified from Hofmann *et al.* (2004)

In Figure 1, the *input indicators* are usually criteria used to assess access to all necessary resources. An input indicator specifies how well the planning would have been performed. An example of an input indicator could be “land was provided on time for well construction” (Haims *et al.*, 2011).

From a program management perspective, the *process indicators* are indicators used to assess the progress of project activities. Indicators could be, for example, whether the project completed on time and within the budget. The *output indicators* are often criteria used to assess the direct products of the project activities; these could be, for example, the number of supplies or services provided. The following chapter will discuss measuring outcomes and impacts.

6. Measuring impact: Evaluations by the Ministry for Foreign Affairs of Finland in 2012

The Ministry for Foreign Affairs (MFA) of Finland describes the evaluation of humanitarian assistance as such: “The OECD/DAC evaluation norms and standards ... [are] the foundation of Finland’s development evaluation” (MFA, 2013). In their new evaluation manual (published in October 2013), the MFA further states that they introduce an approach developed by the United Nations Evaluation Group (UNEG) to integrate human rights and gender equality in evaluations. The purpose of evaluating humanitarian assistance is to improve the quality and promote accountability in development cooperation and development policy (MFA, 2013). MFA conducts centralized evaluations of long-term country programs (generally bilateral aid from government to government and decentralised, program-specific evaluations (MFA, 2013). The program-specific evaluations include appraisals as well as mid-term, final and ex-post evaluations. MFA follows Kaplan’s (1990) reasoning that performance assessment is for the purpose of continuous learning and development. MFA further states that evaluation is important due to accountability requirements and the fact that the evaluation can be seen as a platform for dialogue among stakeholders. The criteria for evaluations are relevance (of assistance), effectiveness, efficiency, impact, sustainability and coordination (MFA, 2013). These evaluation criteria reflect the goals of humanitarian assistance and follow the common practise of measuring efficiency and effectiveness (Ammons, 2002; LeRoux and Wright, 2010). The evaluations have a stated set of criteria to follow, including stakeholder involvement, free and open process, clarity of analysis, validity and reliability of information sources (MFA, 2013). The MFA evaluation manual suggests methods for conducting impact assessments. The manual recommends that the following questions be asked: has progress been made

towards achieving the overall objective(s) of the program; did the program reduce the poverty of all intended final beneficiaries; did the program impact on the lives of the poor women and men through prices, employment, transfers, access, authority, assets or empowerment; and what are the overall impacts of the program, including intended or unintended, long-term and short-term, positive and negative (MFA, 2013). While effectiveness is specified as being related to evaluating the achievements of the programs immediate objectives, efficiency is specified as being focused on value for money. According to the MFA (2013), “indicators to compare the effectiveness of actions can be for example for an educational program (1) school based statistics on attendance; (2) absenteeism; (3) dropouts; (4) learning achievements; and (5) provision of material support”.

The evaluation reports analysed assessed 9 reports, and one evaluation report was a meta-evaluation on specific programs that assessed previously conducted decentralized evaluations (see appendix 1). All the evaluation reports declared an absence of indicators in all evaluated programs, using statements such as, “No indicators to measure sustainability, effectiveness or impact” (Evaluation of Confessional Credit project, 2012). The meta-evaluation report state that in six out of ten analysed projects the indicators where not developed in line with the SMART criteria. In three out of these six reports there were some indicators in place but those where defined only at purpose and outcome levels. In on of the projects (Sustainable forestry and Rural development project in Lao) there had been no indicators included in the project proposal (Meta- valuation report 2012:8). The Meta-evaluation (2012:8:84) further concludes on the lack of indicators: *“though indicators were defined for certain results levels, this did not ensure that indicators were meaningful proxies for the expected hresults”*. Furthermore, although some of the projects had clearly defined indicators from the start of the program the indicators were not updated in the due course of the program: *“In another project the indicators became irrelevant, as they were never modified despite strategic changes to the programme”* (Meta- evaluation report 2012:8:84).

Where program indicators happened to be in use, the results were reported with narrative statements, such as “...that reporting on programme activities within each linkage almost in all cases has been narrative and not focused on reporting on indicators” (North-South Local Government Cooperation Programme, 2012). In some extreme cases, the evaluators argued that they had no way to evaluate whether the programs had achieved the defined goals or not. In some cases, the program goal was unclear and, although there were some indicators in place, the evaluators could not make an assumption on whether the indicators were actually connected to the goal. Most often, the evaluators used qualitative interviews or other materials (such as financial statements) to make a statement on whether the program was a success or not. This was done through the MFA’s predefined evaluation criteria. In spite of having no indicators in place to measure the outcome or the impact of the Confessional Credit project (2012), the evaluation of the program stated, “*efficiency* is rated marginally unsatisfactory, *relevance*, *impact* and *sustainability* and *Finnish value-added* as unsatisfactory”.

A few impact indicators could be identified in the analysed evaluation reports. For instance, in the evaluation of the Energy and Environment Partnership program (2012), clear outcome goals are stated, such as better availability and access to energy, including at the local level. The program had pre-defined indicators, such as reductions in global greenhouse gas emissions and improved air quality. However, the goals were difficult to measure since “baseline studies and performance monitoring were absent” (Energy and Environment Partnership program, 2012). Several of the evaluation reports refer to indicators from the Paris Declaration, which is an effort to harmonize and align aid delivery among donors and among receiving parties. These reports evaluate the programs according to indicators specified in the declaration. Examples of these impact indicators are aid on budget (%), using country procurement system (%), joint missions (%) and in-year predictability (%) (Evaluation of humanitarian assistance in Nepal, 2013).

7. Understanding the measuring and evaluation of humanitarian assistance

In an ideal situation, humanitarian assistance assessment processes would first include explicit short-term, long-term, final and interim goals. Second, an underlying theory behind the assessment would be present, e.g. the theory of change (Burderlein and Dakkak, 2010), the logical framework approach (Drifmeyer, 2004; MFA, 2013) or the results chain (Roche, 1999). Third, a baseline would be present to measure impact against what existed before and, a counter-factual indicator (what would have been the scenario without interference). Fourth, a quality evaluation on the process would be performed to determine whether the service was correctly provided to all the beneficiaries (Bruderlein and Dakkak, 2010; Purdon, 2001).

Three forms for measuring and assessing humanitarian assistance are currently identified. The first is operational performance measurements that are commonly conducted on an on-going basis and do not have program-specific measurements. They can, for instance, be organisational measurements of average lead times or measurements of cost and coverage. Some studies on the assessment and evaluation of humanitarian assistance refer to this form of assessment as self-accountability (Burderlein and Dakkak, 2012; Ebrahim, 2003). Burderlein and Dakkak (2012) state that in addition to structured internal performance measurements, the internal, on-going assessment also includes informal, ad-hoc and undocumented policy and is the most-used form of measurement for learning and development. The same study further concludes that the internal form of assessment is comparatively underdeveloped, which supports Blecken's (2010) findings stating that only 20% of humanitarian organisations use structured internal performance measurements.

The second form of assessment for humanitarian assistance is program-specific evaluations that implementing partners conduct to internally evaluate their program-specific performance and to respond to donor requirements (Burderlein and Dakkak, 2010). The organisational program-specific evaluations are asked to include measurements and indicators connected to pre-defined baseline indicators that have been defined in the program planning phase through a needs assessment (MFA, 2013).

An example of these measurements could be the amount of school books delivered to an educational program.

The third form of evaluations conducted on humanitarian assistance is evaluations commissioned by donors and conducted by external partners. These evaluations strive to measure the larger impact of a program, such as the impact of all assistance donated to a specific country or geographical area. (MFA, 2013). The measurements used for these forms of evaluations are preferably linked to overall economic development indicators, birth rates and illiteracy rates, or to more specific indicators, such as the availability of healthcare services (MFA, 2013). Broader economic development indicators are much more difficult to link to actual humanitarian assistance or the specific donations, since factors not related to specific donations are nearly impossible to exclude.

Table 1. Different forms of assessment of humanitarian assistance

Form of assessment	Goal	Indicator examples	Source of information/data
Operational performance measurement	Intra-organizational and connected to strategy, e.g. efficiency, responsiveness	Lead-time, use of resources	Operational, e.g. from ERP systems or manually gathered
Program evaluation	Intra-organizational and connected to program goals, e.g. decrease in malnutrition rate, increase in literacy rate	Supplies/services delivered	Financial, e.g. from budget
Impact assessment	Environmental and connected to overall mission, e.g. decrease poverty, development, decrease suffering	Crude mortality, years of schooling, population growth,	Development indicators or demographics, e.g. from local authority

Research on operational performance measurement call for indicators measuring outcome and impact rather than the process or the output (Moe *et al.*, 2007; Beamon and Balcik, 2008; Abidi and Klumpp, 2013). Meanwhile, countless evaluations measure the program-specific impact and the long-term overall aid impact, with research calling for more unpretentious evaluation processes with measurable indicators (Burderlein and Dakkak, 2010). As shown in Table 1, three different forms of assessments are currently

being conducted in the humanitarian sector, and they do not seem to be very well aligned. The first form, operational performance measurements, relies mostly on operational data. The commonly used indicators are rarely related to outcome and even more seldom are related to impact. The second form of assessment is program evaluations. These evaluations measure the outcome and impact and rely mostly on indicators with data from the program budget. Indicators that are commonly used to measure program impact are related to cost and the amount of supplies and services delivered. The third form of assessment is impact assessments that are commissioned by a donor. In these assessments, donors measure whether the assistance actually fulfilled the desired impact in the society where it was given; these evaluations are focused on results. The indicators in use are most often broad economic or demographic indicators. The arrows in the table suggest that according to Davidson there should be an alignment between indicator and goal (column 2 and 3); Caplice and Sheffi (1997) state that the source of data and the indicators should be aligned in the sense that the data is available (column 3 and 4). Further the impact evaluations (see figure 7, Hofmann et al., 2004) state that the process output, the program evaluation and the assessment of impact should be aligned (row 2, 3 and 4).

The ultimate measurement of humanitarian assistance would be indicators that connect the operational performance with the impact. Such indicators could, for example, measure the quality of the operations that have a direct link to accountability and impact. If the operations are performed using a high-quality process, few mistakes will be made and thus the outcome will be higher. Another such measurement would be sustainability measurement, which is a direct link between short-term and long-term goals. Using this measurement for local and global procurement would also be an indicator of the outcome of the aid. Other goals that would link short-term and long-term goals, particularly in emergency aid, would be indicators measuring equity and coverage (Balcik *et al.*, 2011). Misalignments can be identified where the operational goal is efficiency since efficiency does not seem to be the primary objective when evaluating outcomes or impact. This is interesting because aid efficiency is a topic of public discussions. The problem with efficiency as a goal is that the term is mostly related to time or cost efficiency, and the question of cost efficiency, particularly in

emergency relief, is a bit out of scope since humanitarian operations generally strive to save lives with the budget they have available. Efficiency in the humanitarian context seems to depart from the classical productivity definition and be more connected to quality and accountability (Haavisto and Goentzel, 2012). In the goal-setting theory, in which an increased focus on one goal can lead to the oversight of another, efficiency seems to be a goal with potential for dysfunctional behaviour. An increased focus on efficiency, particularly cost and time efficiency, might lead to disadvantages related to other goals such as sustainability and accountability.

8. Conclusions

This study supports Burderlein and Dakkak (2010) in their conclusions on the current state of humanitarian evaluations: “Evaluation criteria are often inappropriate ... Impact evaluation as the one really meaningful approach is almost never done, and is just at the beginning of its development”. This study analysed the different forms of assessments that take place for humanitarian assistance and found three forms of assessments with the same goal: to measure the results of aid. These three forms are organisational, on-going performance measurements; program-specific evaluations; and impact assessments commissioned by donors to assess the broader impact of the aid. The data was gathered using content analysis on evaluation reports for programs that received funding from the Ministry for Foreign Affairs of Finland in 2012. The first form of assessment, organisational performance measurements, measure operational efficiency and responsiveness (de Leeuw, 2010; Schulz and Heigh, 2009; Moe *et al.*, 2007; Davidson, 2006; Beamon and Balcik, 2008; Blecken *et al.*, 2009; Gleason and Barnum, 1982; Schulz and Heigh, 2009) via indicators such as donation-to-delivery time, population coverage, order fulfilment rate, order fulfilment cycle time, asset accuracy, on-time delivery and cost efficiency. The second form of assessment, program-specific evaluations, measure the output and outcomes of specific programs (Cozzolino, 2012) and show the causality between the action and its ultimate impact (Tathman and Huges, 2011; Hofmann *et al.*, 2004; Roche, 1999) via indicators such as resources used or program supplies or services delivered (MFA, 2013). The third form of assessment, impact assessment, measures the overall results of humanitarian assistance (Burderlein and Dakkak, 2010). This seems to be the most cumbersome form of assessment since

challenges exist in measuring impact in humanitarian emergencies due to difficult circumstances and a priority on saving lives before setting up structured reporting structures as well as long-term development aid with policy initiatives. Policy initiatives can have complex, immeasurable goals. Measuring impact or results of humanitarian assistance also requires an understanding of what the scenario would have been if the assistance had not been given; however, this information is very difficult to acquire. Due to the difficulty of measuring impact, which can be seen in the MFA (2012) evaluation reports, this paper questions the purposefulness of measuring and evaluating program-specific performance in humanitarian assistance to the extent that it is performed today. The findings indicate that duplications of efforts exist in the assessment of humanitarian aid and that the measurements, evaluations and assessments are rarely used to meet the learning and development goal they were originally developed for. Rather than responding to the goal of constant learning and development, the rigid evaluation of humanitarian assistance responds only to the request for accountability. Particularly further research is called for on how the learning objective of evaluations could better be met.

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Appendix 1

<i>Ministry for Foreign Affairs of Finland (MFA) evaluations analysed</i>	<i>Published</i>
<u>Evaluation report 2012:8 Meta-Evaluation of Decentralised Evaluations in 2010 and 2011</u>	5/6/2013
<u>Evaluation: Bi-Annual Report 2011-2012 of Development Evaluation</u>	12/18/2012
<u>Evaluation report 2012:7 Finland's Contribution to Building Inclusive Peace in Nepal</u>	10/16/2012
<u>Evaluation report 2012:6 Nordic Influence in Multilateral Organizations: A Finnish Perspective</u>	10/16/2012
<u>Evaluation report 2012:5 Finnish support to development of local governance</u>	4/24/2012
<u>Evaluation report 2012:4: Finnish Concessional Aid Instrument</u>	3/8/2012
<u>Evaluation Report 2012:3: Country Programme between Finland and Tanzania</u>	2/8/2012
<u>Evaluation Report 2012:2: Country Programme between Finland and Nepal</u>	2/7/2012
<u>Evaluation report 2012:1: Country Programme between Finland and Nicaragua</u>	1/27/2012
<u>Evaluation report 2012:1 (Special edition) Policy Brief. Country Programmes between Finland and Nepal, Nicaragua and Tanzania</u>	1/26/2012

APPENDIX 6 ESSAY 3

Haavisto, I. and Kovács, G., (Unpublished), "Perspectives on sustainability in Humanitarian Supply Chains".

* Accepted for publication (forthcoming) in Disaster Prevention and Management: An International Journal

Perspectives on Sustainability in Humanitarian Supply Chains

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Abstract

Purpose - The aim of this study is to develop a framework for analysing how humanitarian organisations address different expectations regarding sustainability.

Design/methodology/approach – Quantitative and qualitative content analysis is used to assess the annual reports of humanitarian organisations for their discussions on sustainability overall, and in relation to contextual expectations, subsystems and supply chains, organisational structure and strategy.

Findings – Humanitarian organisations address sustainability primarily from the perspective of contextual expectations from society and beneficiaries. Some fits between supply chain design and societal expectations are attended to, but fits between programmes and contextual expectations are not discussed explicitly.

Research limitations/implications – Annual reports express what organisations want to portray of their activities rather than being direct reflections of what occurs in the field, hence the use of annual reports for the study delimits its findings.

Practical implications – Even though there is a general pursuit of the elusive aim of aid effectiveness, organisational structures need to be further aligned with societal aims as to support these.

Social implications - Beneficiaries are still seen as external to the humanitarian supply chain and humanitarian programmes, though their role may change with the introduction of more cash components in aid, voucher systems, and ultimately, their empowerment through these.

Originality/value – The suggested conceptual framework combines elements of contingency theory with a prior four perspectives model on sustainability expectations. The framework helps to highlight fits between the humanitarian context, operations and programmes as well as misalignments between these.

Category: Research paper

Keywords: humanitarian organisation, disaster relief, sustainability, humanitarian supply chain, contingency theory

Introduction

The rationale underlying humanitarian aid is to help people in need. The SPHERE standards (2011) state two principles guiding humanitarian operations: “those affected by disaster or conflict have a right to life with dignity and, therefore, a right to assistance; and second, that all possible steps should be taken to alleviate human suffering”. However, humanitarian aid has been criticised for its ineffectiveness at a macro-economic level (Burnside and Dollar, 2000; Rajan and Subramanian, 2008) and even condemned for constraining development (Moyo, 2009). Conversely, other investigations demonstrate that aid can contribute to economic development (Burnside and Dollar, 2000; Hansen and Tarp, 2004), although results differ according to policy (Dalgaard *et al.*, 2004) and geographical location (Clemens *et al.*, 2004).

On a more operational level, considerations of aid effectiveness have led humanitarian organisations (HOs) to focus on cost and time efficiencies in addition to transparency. Criticisms remain for overlooking equity (Balcik *et al.*, 2010), customer service (Oloruntoba and Gray, 2009) and sustainability (Haavisto and Kovács, 2012), all of which would be essential for aligning the operational with the longer-term objectives of humanitarian aid. Several large donors (ECHO, 2010; World Bank, 2011; USAID, 2012) have incorporated long-term objectives into their requirements of HOs, obliging them to consider the persistence of their impact in programme planning. A further increase in the awareness of long-term impacts has been pioneered by the United Nations Development Programme’s (UNDP, 2013) climate change adaptation agenda. Nonetheless, the long-term impacts of aid are difficult to monitor and evaluate. Neither is it clear which impacts should be included in such an assessment, for instance ecological, nor how exactly HOs should consider them.

The aim of this study is to develop a framework for analysing how humanitarian organisations address different expectations regarding sustainability. According to contingency theory, contextual expectations are an important aspect for organisations to consider and to attempt to “fit” with, also in terms of developing performance objectives aligned with their overall objective (Tosi and Slocum, 1984). In order to do so, we analyse annual reports of large HOs in the period of 2010/11.

The article is structured as follows. First we present insights from previous literature on performance, and sustainability expectations in the humanitarian context. We then

develop a coding scheme for the content analysis of annual reports (ARs) on the basis of existing frameworks. Findings from the analysis are presented next, before drawing conclusions for the understanding of sustainability in the humanitarian context.

Assessing the impact of humanitarian aid

The main performance expectation on HOs can be derived from their very aim to save lives (Beamon 2004, Kovács and Spens, 2007), decrease human suffering (ICRC, 2010) and contribute to development (UNDP, 2010/11). Donors are interested in the performance of the programmes they support as well as their societal impact. Overall, expectations vary from a beneficiary and programme focus to macro-economic aspects of aid effectiveness. But while aid effectiveness is the mantra of all humanitarian and development activity, assessing the macro-economic impact of humanitarian aid is tricky from an organisational, and especially from a supply chain perspective. After all, aid effectiveness lies at the convergence of the parallel efforts of several HOs and their supply chains.

Humanitarian supply chain management can be understood to encompass the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes co-ordination and collaboration with actors, which can be suppliers, intermediaries, third party service providers, donors, implementing partners and beneficiaries. In essence, humanitarian supply chain management integrates supply management and needs assessment within and across HOs and other actors. (Based on the CSCMP 2011 definition of supply chain management.) Humanitarian supply chains (HSCs) encompass operational activities in the areas of disaster relief as well as development programmes, though are not active in the area of bilateral or multilateral official development aid. The HSC includes all actors involved with the material, information, and financial flows related to these programmes.

HSCs are claimed to be highly agile, since they function in an uncertain context and must adapt to constantly changing requirements, both in terms of scaling up and down in volume and scope, as well as considering time- and place-related uncertainties (Long and Wood, 1995; Beamon, 2004). HSCs have been divided into categories of relief and development supply chains (van Wassenhove, 2006) much like a mandate-based division between humanitarian and development programmes. It could be claimed that

long-term goals are more relevant in development aid programmes whereas in disaster relief, saving lives is of essence. However, Jahre and Heigh (2008) has found this division into development and relief supply chains to be inconclusive, since aid distribution also occurs in the context of slow-onset disasters, or in environments receiving ongoing development aid augmented with the need from reoccurring disasters. This operating environment thus requires flexible supply chains that can be equipped to handle both longer-term (and better planned) development aid and shorter-term disaster relief (ad hoc nature).

The humanitarian setting has furthermore been stated to be characterised with lack of planning (McEntire and Myers, 2004; van Wassenhove, 2006; Tomasini and van Wassenhove, 2009) and criticised for limited co-ordination and collaboration amongst involved actors (McEntire, 2002; Blecken *et al.*, 2009). Frictions between long- and short-term goals and diverse performance expectations from various actors result in conflicting performance objectives. Such frictions also exist in the commercial sector, with longer-term objectives including quality, innovation (Sink *et al.*, 1984) and sustainability (Carter and Rogers, 2008) and shorter-term objectives such as, cost reduction (Ballou, 2004) or profitability (Sink *et al.*, 1984).

Not surprisingly, defining performance measures for performance objectives is an onerous task (Shepherd and Günter, 2006). Performance measurements are understood as the process of analysing and reporting information on performance, and exist to clarify whether an individual, group, organisation or operation meets set performance objectives (Franco-Santos *et al.*, 2007). If performance was to be defined how it is measured in the humanitarian sector, it would commonly be assessed as financial performance, or time and volume-related performance, with indicators such as lead times (Blecken *et al.*, 2009). Various performance measurements have been suggested for the humanitarian context, such as output, resources, flexibility (Beamon and Balcik, 2008); customer service, financial control and process adherence (Schulz and Heigh, 2009); donation-to-delivery time, output and resources (Blecken *et al.*, 2009); aid equity (Balcik *et al.*, 2010), impact on the local economy (Tomasini and van Wassenhove, 2009) and even the cultural appropriateness of items (Long and Wood, 1995).

It is though difficult to capture varying stakeholder expectations in performance measurements. For example, impact-related performance measures that portray

operational output fall short in capturing longer-term objectives such as that of sustainability. When Beamon and Balcik (2008) refer to output, their suggested measurements are population coverage and order fulfilment rate. These do not reflect the overall impact of aid, though are important contributors to this impact. There should though be a link between some operational performance expectations and the long-term impact of aid. For example, access to beneficiaries facilitates a positive impact of a programme, and a positive impact on the community of these beneficiaries. Reversely, access to aid is a defining factor on whether aid can reach certain communities at all. Equity is another good example of social implications of aid, as it indicates whether the most vulnerable population has been reached (cf. Balcik *et al.*, 2010). Such performance expectations feed into the longevity and sustainability of aid.

Sustainability expectations as contextual factors of humanitarian organisations

First and foremost, humanitarian aid adheres to the Hippocratic tenet of “ὠφελέειν ἢ μὴ βλάπτειν”, i.e. “Help, or do no harm”, which in medicine has been encapsulated in the Hippocratic Oath. Anderson (1999) extended this thinking to the humanitarian context when it comes to the underlying processes of delivering aid in a manner that supports peace processes, acknowledging that the way aid is delivered, and the supply chain behind it, is instrumental to supporting or hindering bigger societal developments. The principle of “do no harm” is still used in this interpretation by the Global Protection Cluster. A different interpretation of this principle could see it in the light of humanitarian aid supporting or hampering development, or as a precept for not harming the natural environment.

Many of the performance expectations on humanitarian aid can also be understood as sustainability expectations. Saving lives and decreasing suffering correspond with social responsibility, while contributing to development resonates with the longer-term aims of sustainability, especially if combined with ecological aspects of sustainable development. Literature often differentiates between the economic, ecological and social dimensions of sustainability following the triple bottom line model (e.g. Carter and Rogers, 2008; Seuring and Müller, 2008), though Weerawardena *et al.* (2009:347), for example, define sustainability in the non-profit sector as “being able to survive so that it [the organisation] can continue to serve its constituency”, in other words, as maintaining operations. ALNAP (2007), on the other hand, defines sustainability as “measuring whether an activity or impact is likely to continue after donor funding has been withdrawn”. This definition highlights the long-term (social)

impact of humanitarian interventions. To broaden the scope, we will adhere to the broader definition of sustainable development as “meeting the needs of present without compromising the ability of future generations to meet their own needs” (WCED, 1987). This is to denote a rather embedded overall positioning that embraces many different expectations on sustainability. Various sustainability expectations have been categorised by Haavisto and Kovács (2013) into four perspectives: societal, beneficiary, supply chain, and programme perspectives.

These four perspectives can be approached through contingency theory, which extends organisational theory by stating that it is not only the organisational structure and strategy that influence organisational performance but also the context (Lawrence and Lorsch, 1967; Perrow 1979; Thompson, 2003). Contingency theory has been used in management and organisation research in contexts in which uncertainty in the business environment played a major role. Furthermore, research on temporary organisations and organisations conducting project work, such as consultancy firms (Morgan 1997), has found explanatory power in Burns and Stalker’s (1961) original contingency theoretical notion that organic structures fit best with uncertain environments. Similarly, the humanitarian sector operates in an uncertain setting and humanitarian operations are of ad hoc or project nature.

Embedded in contingency theory is further the construct of “fit”, where improving the fit between an organisation and its environment leads to improved performance (Tosi and Slocum, 1984). When it comes to sustainability expectations, the fit between the societal perspective as the context is stressed for the understanding of internal perspectives. For example, the organisational and programme objectives of efficiency relate to contextual objectives of improving livelihoods. Putting the four perspectives into a contingency theoretical framework helps to illustrate not only the perspectives but also the needs for fit between these (see Figure 1).

But while contingency theory is a theory of the firm, it can also incorporate the supply chain if the supply chain is perceived as an organisational subsystem. In the humanitarian context, HSCs are either perceived as organisational-internal ones, in which case the focus is on joint procurement at headquarters supplying various country and field units of the same organisation, or seen as the combination of an ad hoc network of organisations involved in the relief operations of the same disaster with the complex end-to-end supply chain of each individual HO that contributes with materials

and services to the programmes of these HOs (Tatham and Pettit, 2010). In either case, the focus is on the support of the HO's programmes, hence we include the supply chain in the organisation's subsystem in Figure 1, in line with Choi and Hong's (2002) observation that the supply chain can be seen as an internal contingency factor.

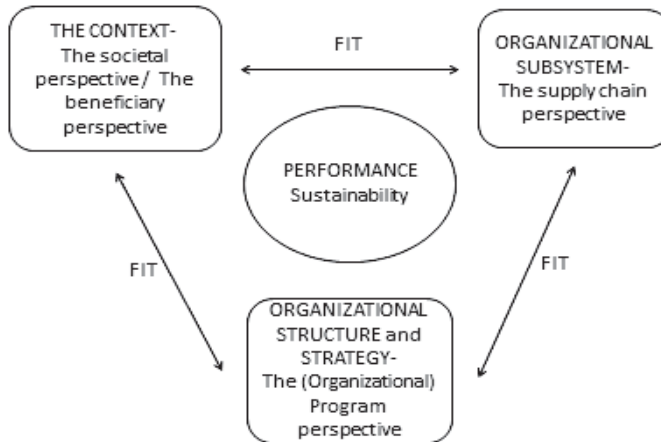


Figure 1: A contingency theoretical framework of essential fits between sustainability expectations

(based on the contingency theoretical approach of Tosi and Slocum, 1984, p.18)

The first, *societal perspective* in Haavisto and Kovács (2013) framework makes a macro-economic assessment of aid effectiveness (see Table 1 for a list of aspects under the various perspectives). Overall, societal expectations are external contingency factors beyond mere contextual change. For example, climate change risk is an important aspect of demand uncertainty, both from the aspect of what constitutes demand as well as how such demand will develop in the future.

It is a bit ambiguous whether the second, *beneficiary perspective*, should be included into the organisational context, subsystem, structure, or strategy. One of the aspects Haavisto and Kovács (2013) include here is that of needs fulfilment, in essence how well the needs of beneficiaries have been met. The very idea of needs fulfilment can though be debated. Oloruntoba and Gray (2009), for example, rather talk about customer service. Yet the “customer” notion of beneficiaries remains disputed due to the lack of their purchasing power (van der Laan *et al.*, 2009). Therefore, we included the beneficiary perspective in the organisational context rather than the programme or supply chain perspectives, while seeking fits with the latter two. Consequently, also

demand uncertainty is seen as an external contingency factor, though if beneficiaries were integrated in the HSC, it could be seen as an internal one.

	Perspective	Aspect¹	Expressed as
Context	Societal	Social welfare	Either a function of the individual's welfare, or aggregated measures such as life expectancy and income per capita.
		Livelihood	The society's, individual household's or individual's ability to support themselves. ²
		Economic development	Expressed through GDP, or the percentage of a population living in poverty vs. in extreme poverty
		Climate change	The society's or organisation's capability to reduce their impact on climate change, and to adapt to living in a changing (ecological) climate. Climate change mitigation can result in hazard-resistant construction as well as improved environmental policies. ³
	Beneficiary	Access	The opportunity for supplies to meet the beneficiary, more precisely, the right supplies meeting the beneficiaries need with the right supplies or services at the right time in the right place. ⁴
		Targeting and equity	Correctness of the needs assessment (who is in need?) and the even coverage of that target group.
		Needs fulfilment	Function of how well beneficiary needs have been served overall.
Organisational subsystem	Supply chain	Ethical and green products/services	The actual items or services delivered to the beneficiary where for example a non-disposable product might cause more harm than do good.
		Ethical and green operations	Expressed and supported by supply chain design.
		Preparedness	Mitigation of effects of disasters from the governmental perspective ⁵ , as well as prepositioning items and developing preparedness capabilities ⁶
		Local sourcing	The incorporation of local resources, materials, and people.
Organisational structure and strategy	Programme	Financial continuity	The possibility of a programme to continue serving the beneficiaries in need.
		Resource utilisation	Asset maintenance and disposal as well as the sharing of resources across programmes and organisations.
		Persistence of programme impact	The persistence of activities, services and interventions, or the persistence of resulting changes for individuals or the aided society. ⁷
		Linking relief to rehabilitation and development (LRRD)	Addressing the gap between disaster relief and development activities and programmes through e.g. handovers and capacity building.
		Empowerment	Community involvement (active role in planning and decision making) or capacity building.

Table 1. Sustainability expectations and their various aspects

¹summarised from Haavisto and Kovács (2013); ²Régner *et al.* (2008), ³UNISDR (2013), ⁴Kovács *et al.* (2010), ⁵Tatham *et al.* (2012), ⁶Gatignon *et al.* (2010), ⁷Schröter (2010)

Sustainable expectations from the *supply chain perspective*, on the other hand, follow sustainable supply chain management overall, in that they combine considerations of

products, services, as well as processes in the supply chain. Other aspects, such as preparedness, and the emphasis on local sourcing, stem from HSCs. At large, it is expected that preparedness activities would improve the time efficiency of disaster relief if not mitigate the need for it overall. Local sourcing, on the other hand, can have a positive impact on the economic situation in the region and can be seen as an action of community empowerment (Kovács and Spens, 2011) with a positive impact on regional economic development. Therefore, the current trend is towards favouring local sourcing wherever possible (Jahre and Spens, 2007). Interestingly, the supply chain perspective can be seen as an internal contingency factor (Choi and Hong, 2002), notwithstanding the expectations of governments and communities on the supply chain.

The final perspective portrays sustainability from the viewpoint of a defined aid programme. The *programme perspective* is important as HOs typically structure their activities under various programmes. Also donors grant funding for specific programmes. Programme-related expectations are a mix of internal and external contingency factors as they refer to, *inter alia*, structural differentiation and decentralisation (Donaldson, 2001), which, in turn, affects how programmes are managed and set up to have a long-term impact. From a sustainability perspective, one should keep in mind what effects including possible harms disaster relief can have on recovery and on societal development in the long run.

Research design and methods

Content analysis has often been used in sustainability research, and on the cross-roads of sustainability and supply chain management – see e.g. Srivastava (2007) or Seuring and Müller (2008), as well as to evaluate the skills requirements of humanitarian logisticians (Kovács *et al.*, 2012), and to analyse current humanitarian logistics literature (Kunz and Reiner, 2012).

As Krippendorff (2004) and also Saldaña (2011) argue, content analysis can focus on the manifest or also latent content, and be either quantitative or qualitative, or both. Seuring and Gold (2012) describe the four steps of content analysis to consist of material collection, descriptive analysis, category selection, and material evaluation. First, we sampled large organisations by the total sums in 2010 they appealed from donors based on UN OCHA's Financial Tracking Services (see Table 2). Appeals were selected as the sampling criterion in order to be able to capture disaster relief-related

activities even though many organisations are active both in relief and development. Of course, appeals do not reflect resultant funding or the overall budgets that would include the permanent funding of an organisation; rather, they indicate planned activities during disasters. However, appeals reduce the UN bias of looking at budgets only. Narrowing it down, we selected those organisations that issued a general annual report (in contrast to a theme-based or country-specific AR) and exceeded the amount of 100 million USD of committed/contributed appeals in 2010. This cut-off point left us with a good spread of organisations (four UN agencies, three organisations of the Red Cross movement, and four international NGOs) that have large enough operations to report on in detail. The ARs in the resultant sample are noted with an asterisk in Table 2.

Table 2. Study sampling and sources

Organisation	Acronym	USD committed / contributed to appeals in 2010¹	Annual report
World Food Programme	WFP	4 288 770 520,00	General AR 2010*
United Nations High Commissioner for Refugees	UNHCR	1 472 434 648,00	Country- and theme-based AR
United Nations Children's Fund	UNICEF	1 023 749 781,00	General AR 2010*
International Committee of the Red Cross	ICRC	586 931 430,00	General AR 2010*
International Organization for Migration	IOM	305 696 877,00	Country- and theme-based AR
Food & Agriculture Organization of the United Nations	FAO	296 534 320,00	Theme-based AR
United Nations Relief and Works Agency for Palestine Refugees in the Near East	UNRWA	272 314 139,00	Theme-based AR
Catholic Relief Services	CRS	255 308 740,00	General AR 2010*
American Red Cross	ARC	244 036 254,00	General AR 2010*
Save the Children	STC	242 969 905,00	General AR 2010/11*
Office for the Coordination of Humanitarian Affairs	OCHA	239 031 613,00	General AR 2010*
International Federation of Red Cross and Red Crescent Societies	IFRC	204 958 389,00	General AR 2010*
World Health Organization	WHO	203 410 696,00	Theme-based AR
Médecins sans Frontières	MSF	150 865 837,00	General AR 2010*
Emergency Response Fund (OCHA)	OCHA (ERF)	137 847 025,00	Included in OCHA annual report
United Nations Development Programme Total	UNDP	127 685 075,00	General AR 2010/11*
OXFAM GB Total	OXFAM	119 243 321,00	General AR 2010*

¹FTS data, accessed through ReliefWeb Nov 18, 2011, eliminating bilateral, various recipients etc.

*Annual reports included in the sample, with the top 10 general reports being selected

ARs express what organisations want to portray to external stakeholders and reflect the strategies HOs use to respond to the contingency factors of sustainability expectations. ARs were chosen since the humanitarian sector has not, as of yet, embraced sustainability standards nor certificates. For example, out of 2032 Global Reporting Initiative (GRI) reports in the year 2010, only 57 were from non-profit organisations and only three from HOs, Oxfam GB, Caritas del Perú, and World Vision Australia. Similarly, a recent Ecorys study (2012) shows that also donors place little emphasis on sustainability so far (see Appendix 1). On the other hand, ARs are not appeal-specific, and therefore, depending on organisational mandate, may include both humanitarian interventions as well as development assistance. This was seen as a benefit as this way we could assess the link between the two, if there was any.

Our material collection and first descriptive analysis was conducted as a keyword search including terms such as “sustainab*” and similar Boolean searches. However, the keyword searches resulted in few hits (see Table 3), and also, keywords were used in alternative meanings as well, therefore the analysis of latent content became necessary. Saldaña (2013) suggests a number of different coding techniques for the assessment of latent content in a content analysis, from values coding to pattern coding. Due to the lack of hits through keyword searchers, we used structural coding for the identification of broader texts on a given topic, and analysed then these more in detail for their latent meanings. Still, we used the labels from the Haavisto and Kovács (2013) four perspectives framework as the basis for identifying the structures.

The quality of a quantitative content analysis is typically assessed via inter-coder reliability. However, qualitative content analyses (such as ours) rather use the approach of a discursive alignment of interpretation, during which coders are not independently assessing the material at hand but rather continuously debate issues as they arise through the coding (Seuring and Gold, 2012). Using two coders helps eliminating in what Berger (2013) calls “unconscious editing”, and suggesting the consulting of another researcher throughout the analysis as a way of “triangulation by comparison” in order to secure the data to be a trustworthy representation of analysis categories. We therefore used two coders, but still, existing conceptual frameworks to deductively develop main categories and a clear coding scheme. The use of such a coding scheme and clear decision rules for categorisation improves both the objectivity and transparency of the content analysis (Krippendorff, 2004). We first analysed each

document separately for each category before proceeding to a category-based cross-document and thus, cross-case analysis.

Table 3: Quantitative results from the content analysis

Organisation Year	WFP 2010	UNICEF 2010	ICRC 2010	CRS 2010	ARC 2010	STC 2010/1 1	OCHA 2010	IFRC 2010	MSF 2010	UNDP 2010/1 1	OXFAM 2010	Total
sustainab*	1	7	63	0	0	0	2	2	4	18	3	100
<i>Societal perspective</i>												
welfare	0	4	21	2	0	0	1	0	1	5	0	34
livelihood	6	1	126	0	4	7	6	6	4	10	15	185
economic development	0	3	3	1	0	0	1	0	1	5	0	14
climate change	0	2	4	0	0	0	10	5	0	18	31	70
<i>Beneficiary perspective</i>												
access	3	31	593	1	1	4	69	5	76	28	12	823
targeting	1	3	16	0	0	2	10	0	3	6	1	42
equity	0	36	2	2	0	0	7	0	0	1	0	48
needs fulfilment	0	0	0	0	4	0	0	0	0	0	0	4
<i>Supply chain perspective</i>												
ethic*	0	1	20	0	0	0	0	0	2	1	0	24
green	4	0	3	6	0	0	0	0	0	0	1	14
preparedness	4	5	38	1	16	5	96	10	3	4	1	183
local	14	22	312	11	14	12	35	6	45	42	11	524
<i>Programme perspective</i>												
financial continuity	0	0	0	0	0	0	0	0	0	0	0	0
resource utilisation	0	0	0	3	1	0	0	0	0	0	0	4
programme impact	0	0	0	0	0	0	0	0	0	0	0	0
LRRD	0	0	0	0	0	0	0	0	0	0	0	0
empowerment	0	2	4	1	0	0	1	0	1	3	1	13

Findings from the content analysis

The selected ARs varied in structure, length and depth. The length of a report obviously influences the number of times a keyword is mentioned. As shown in Appendix 1, the number of hits per keyword varied from “access” (823 times) and “local” (524 times) to keywords that were not mentioned at all. A more in-depth, latent content analysis was needed to overcome these shortcomings and unearth perspectives that the keyword search could not capture. Hence we analysed each document through searching for text on the topic of each category, first through using the terms of the category (e.g. “community”, “empowerment” for the category of community empowerment) but then also reading through the text once more to discover further related latent content (e.g. capacity building).

Sustainability was explicitly addressed in 8 out of 11 analysed reports. The reports of CRS (2010), ARC (2010) and STC (2010/11) did not mention the term sustainability directly, though the latent content analysis found that aspects of sustainability are brought up also in these reports. Most often, organisations used the term sustainability in relation to development. IFRC (2010) for example state that their work in Haiti not only strives for a healthier future but a more sustainable one. ICRC's (2010:27) report refers to sustainability most often (63 hits), defining it as "*taking into account longer-term impact and looking for lasting solutions to the needs or problems encountered*", and accentuating sustainability as a goal alongside with feasibility, relevance and appropriateness. They further discuss sustainability from a societal perspective: "*the priority is to support and strengthen existing structures through initiatives taken in conjunction with the authorities and/or through specific programmes that meet the needs of the population in a viable, sustainable manner*". UNDP (2010/11) also highlights sustainability as an important theme, most likely due to the fact that sustainability is one of the four pillars in their mandate. UNDP (2010/11) suggests an ecological or "green" understanding of the term, stating that one of their core areas is to "*manage energy and environment for sustainable development*", and further listing projects with a sustainability focus, such as "*sustainable micro-hydro*" projects and the establishment of "*organic model farms*". UNICEF follows UNDP's understanding of sustainability and discusses it mostly from an ecological perspective, e.g. in "*sustainable land management*" (UNICEF, 2010:40). Other organisations discuss sustainability in a fairly vague manner, but the latent content analysis helped to reveal more details to their understanding.

The societal perspective on sustainability

ARs are written for a variety of stakeholders, which for HOs includes society overall. The ARs reflected on the aspects of social welfare, livelihood, economic development, and climate change mitigation to varying degrees. *Social welfare* was addressed in terms of social justice (social exclusion vs. inclusion), social advancement (WFP, 2010) and positive social change (UNICEF, 2010). On the aggregate level, social welfare was discussed in relation to child welfare, for which life expectancy was indeed a measure, as well as welfare systems overall. Rather than an individual measure, social welfare came up in conjunction with economic development and equity considerations, indicating a "fit" between these. For example, the following is stated in UNICEF's AR (2010:5): "*promoting equitable development is integral to sustainable economic and social recovery*". Interestingly, MSF (2010:107) accounts for part of their funding other

funds used for their “*social mission*”, which they define as “*all costs related to operations on the field (direct costs) as well as all the medical and operational support from the headquarters directly allocated to the field (indirect costs).*”

The concept of resilience was often represented in relation to *livelihoods*, whether to “protect livelihood” or resilient buildings to support livelihoods (examples from ICRC, 2010) or to “*strengthen resilience to shocks and preserve livelihoods*” (WFP, 2010:38). This conjunction is not surprising given that the concept of livelihoods refers to the society’s or individual’s ability to support themselves, and due to the negative impact disasters have on livelihood (Young *et al.*, 2001). Interesting conjunctions were made between sustainability and livelihood, for example Oxfam (2009/10) talking about “*a right to a sustainable livelihood*” as one of its aims. Sustainable livelihood further refers to maintaining or even enhancing capabilities now and in the future (Régnier *et al.*, 2008), which is expressed as “building back better” in several ARs. The UN agencies discuss livelihood as part of a larger UN goal, e.g. OCHA (2010:25) states that they “*contributed to UN policy coherence on issues such as protection and livelihood interventions.*”

Economic development was discussed as but one aspect of many that are needed to meet the goals of an HO. Several organisations (UNDP, OCHA, CRS and UNICEF) state that economic development alone is not enough. “*Economic growth alone has not been enough to sweep away the deeply rooted social and economic inequities that make some children more at risk*” (UNICEF, 2010:4) or “[*we*] came to understand that it was not enough to work on economic development but to place such work in a broader context of human development” (CRS, 2010:28). Conversely, classical measures of economic development were not represented in ARs, neither as GDP nor schematic poverty measures such as the percentage of the population living on a dollar or less a day; only MSF (2010) reflects over the potential of “economic growth” when discussing countries in which they operate.

Then again, economic development was portrayed as interconnected with climate change mitigation: “*Climate change has enormous economic repercussions for developing countries, through its impact on agriculture and livelihoods, and through increased natural disasters. Economic justice will not be achieved without addressing climate change*” (Oxfam, 2009/10:8). Overall, climate change mitigation was the most discussed aspect of the societal perspective. The discussion is not one of reducing

greenhouse gas emissions (as in the UNISDR definition, though IFRC (2010) and WFP (2010) have both launched initiatives to offset transportation emissions) but rather, focusing on adapting agriculture (Oxfam, 2009/10) and food security (OCHA, 2010). Climate change is also problematised as a cause of migration, leading to questions of climate justice. UNDP (2010/11), IFRC (2010) and UNICEF (2010) further address changing disaster patterns due to climate change as something the humanitarian community needs to prepare for.

The beneficiary perspective on sustainability

The access of organisations to an area and the access of beneficiaries to aid are preconditions for the success of any humanitarian operation (Mancini-Roth and Picot, 2004). Access is considered from two main perspectives in the ARs:

- (a) Differences in disaster vulnerabilities across beneficiary groups (e.g. children, women, HIV patients), and
- (b) Differences in the access to aid dependent on the geographical (mostly rural vs. urban) location of beneficiary groups.

Local partnerships are mentioned as a factor to ensure access both to beneficiaries and implementing partners. For example, OCHA (2010:50) negotiates with local governments to “*improve humanitarian access*” and UNDP (2010/11:1) describes that “*long-term in-country presence is critical for building trust with and access to national partners*”. UNICEF (2010:5) focuses on equity for facilitating access, stating that “[*e*]quity-focused strategies are being developed to improve the provision and use of services by reducing barriers that result from factors such as geographical location, income poverty and lack of awareness.” They further improve access by assisting in procurement, using purchasing economies to improve the financial accessibility of health care products; just as WFP does for food and agricultural products through their programme called “*purchase for progress*”. UNDP (2010/11:11) considers access to services, such as microloans: “*UNDP also worked with local authorities to encourage male family members to grant inheritance rights to women, enabling women to leverage property rights for access to microloans.*” But also transport infrastructure facilitates or inhibits access, e.g. leading to air drops as modal choice: “*Close to 3,500 missions were flown in total, transporting more than 12,200 metric tons of food and other emergency humanitarian goods for almost 20 different organizations, providing supplies to an estimated one million people who were inaccessible other than by air*” (WFP, 2010:11).

Targeting and equity are often used synonymously as both imply addressing gaps in aid deliveries and helping the most vulnerable first. Some organisations' target groups are defined in their mandates, e.g. UNICEF targeting children, or WFP's nutrition focus on children under 1,000 days and on pregnant women. Other targets can be geographical areas, specific programmes, or, in the case of advocacy, different stakeholders (authorities, gender, donors). For example, WFP targets "*areas where the harvest hadn't yet come in*" (WFP, 2010:24), UNICEF countries with high mortality rates and communities with high refugee rates, and MSF (2010) working populations around industrial centres in a TB programme. On the other hand, UNDP (2010/11) in Armenia targets "*water, sanitation, electricity, gas, job creating, microfinance and environmental renewal*".

Every AR reflected over the needs of beneficiaries, but few mentioned *needs fulfilment* as a function of meeting the needs that were assessed. The IFRC 2010 AR specifically focuses on meeting the needs of beneficiaries and on fulfilling missions - but not on needs fulfilment. This goes to show that the overall focus is on the programme, and even though the various needs of beneficiaries are targeted, in the end it is the mission, or programme, on which level deliveries and fulfilment are assessed. Then again, ARs also fulfil the function of donor communications, and funds are for given programmes, whilst, beneficiaries typically lack purchasing power – which is something cash transfers, vouchers, and electronic coupons aim to reinstate.

The supply chain perspective on sustainability

We found though very little in ARs that would have related to *ethical/green products, services, or supply chains*. ICRC (2010:24) mentions the ethical responsibility organisations have when making service and product choices for beneficiaries: "*People benefiting from humanitarian action depend on the quality of the service they get from organizations that they cannot really choose for themselves. Those organizations therefore have an ethical responsibility to take into account local capacities, culture and vulnerabilities*". WFP planted trees to offset transportation emissions, UNICEF included the combat of unethical marketing in a programme – but apart from such minor details, issues of ethics and/or greening were not discussed in relation to neither products and services, nor to programme, nor to supply chain design.

Preparedness, on the other hand, was integral to not just particular programmes but to the activities of all HOs overall. This category included efforts to strengthen of governments for preparedness on the national level (Oxfam, 2009/10), the incorporation of preparedness and disaster risk reduction measures in all programmes (UNICEF, 2010), to the use of satellite imagery for mapping upcoming food deficits as part of preparedness for famines (WFP, 2010). Interestingly, as envisaged in the Haavisto and Kovács (2013) framework, many preparedness activities relate to supply chain management, whether it is to prepare legal systems of various countries to facilitate a potential influx of aid (IFRC, 2010), or the development of risk assessment methods for advance planning (WFP, 2010). Interestingly, OCHA's (2010) "*Strategic partnership for preparedness project*", or STC's (2010/11) and CRS' (2010) first-aid training and education relate preparedness to capacity building for disaster risk reduction. Missing from the reports were the supply chain-related preparedness activities such as prepositioning of supplies and other resources.

Local sourcing came up in different ways as well. Local HO chapters helped in organising and distributing disaster relief, reducing response times as predicted by Gatignon *et al.* (2010). Local HOs and even companies were used as implementing partners. STC (2010/11:10) state that their strategy is "*based on partnerships with local communities that mobilise resources to support children and families in need*". WFP's voucher system was employed to restate the purchasing power of beneficiaries in a way that they would buy local food items from local stores, in essence strengthening local capacity and agricultural production. WFP further informs on establishing local production for therapeutic food products. The conjunction to sustainability is made throughout, as the aim of engaging local partners is to "*stimulat[e] the local commercial sector*" (WFP, 2010:12).

The programme perspective on sustainability

In spite of almost no keyword hits, ARs emphasise the programme perspective through short sections on particular programmes an organisation got funding for during the fiscal year. For example, *financial continuity* often refers to programmes that have been continued over several years and addresses the need for their further continuation as well as the challenge of finding continuous funding for such programmes, or the challenge to continue a programme under financial constraints. Most interesting is the discussion on discontinuing a programme, for example WFP (2010) problematising how they will continue to support a country after handing over a school feeding

programme to the government, or MSF (2010) handing over medical supplies to hospitals at the end of their operations. Another much discussed problem is the impact of the financial crisis on humanitarian aid.

Effective resource utilisation is hence the more important though seldom directly addressed. UNICEF's (2010) report on resource utilisation is the exception in that it reports on the pooling of funds and activities, and even how they expect a new ERP system to improve the tracking and utilisation of resources. Sharing resources with other organisations comes up in other ways as well, through reflections on the cluster system (and in particular, the WFP-led Logistics Cluster). Sharing through joint programmes is rather novel and the more interesting as it constitutes a great effort to break down organisational boundaries for "own" operating methods and goals (cf. Long and Wood, 1995). However, other issues such as asset maintenance and disposal cannot be found in the analysed ARs.

The *persistence of programme impact* is surprisingly little addressed. Lasting impacts seem to be more a question of training beneficiaries directly (through educational programmes, agricultural training), and of moving from handing out materials to micro-financing systems. MSF (2010) briefly states measuring how many patients continue treatment after the discontinuation of a programme as a way of assessing longer-term programme impact, as well as measure their impact in terms of reduced mortality rates. Only Oxfam (2009/10) explicitly discusses the impact of joint programmes and the impact of programmes of livelihoods in the long run. That said, the persistence of programme impact is problematised through *linking relief to rehabilitation and development (LRRD)* albeit LRRD as such is not mentioned in the reports. For example, MSF (2010) questions the impact of reduced global funds for HIV programmes due to the financial crisis. More often, the transition from relief to development is expressed as "growing into development programmes". The nexus of disaster relief and development is dealt with through existing programmes and staff in a region facilitating quick disaster response, and in terms of building back better – in essence, closing the loop from preparedness to relief to reconstruction, and preparedness again. WFP (2010:4) reflects over a relief programme as follows: "*Not all of that food was employed for emergency relief. Some was used to support a wide array of programmes helping communities build better futures by bridging the gap between immediate relief and longer term recovery.*" Overlaps between relief and development programmes led to a discussion of phasing out relief and handing over to

development. Therefore, we would suggest merging the categories of “persistence of programme impact” and LRRD in further research.

Community empowerment, the last category under the programme perspective, is intrinsically related with handing over programmes and with capacity building. A myriad of other issues were though also reported under this category, e.g. the use of local (community-based) chapters in the organisation of a HSC (IFRC, 2010), using community members as employees, as well as WFP’s electronic coupons to improve the purchasing power of beneficiaries. OCHA (2010:51) presents vouchers as a mechanism to empower beneficiaries: “families receive vouchers to purchase commodities, empowering them to make decisions instead of receiving”.

Conclusions

Both the concept of sustainability, and sustainability-related expectations are highly diffuse in the humanitarian setting. Yet sustainability can be seen as a performance objective parallel to efficiency, quality and flexibility. Sustainability has been treated as such a performance objective in companies and their supply chains (Carter and Rogers, 2008). In the humanitarian setting, donors have set sustainability as a goal (Haavisto and Kovács, 2012). We studied sustainability expectations through further developing Haavisto and Kovács (2013) four perspectives into a contingency theoretical framework (Figure 1). This framework helps not only to separate between various perspectives on sustainability, and sustainability-related expectations, but also, to seek a fit between these perspectives.

Generally, whilst society expects economic development, or at least a “back to track” from humanitarian aid, HOs can only evaluate whether their missions have been accomplished and approach the success of a programme from this perspective. Humanitarian programmes are though not set up in a vacuum, rather, they should support the development of society at large. Hence the fit between the organisation and its strategy with its organisational context is not a matter of corporate survival but essential for the alignment of humanitarian interventions with larger societal aims. The fit between context, organisational subsystems, strategies and structures is therefore the more important.

Our findings indicate that some of the aspects from various perspectives on sustainability support each other, and are discussed in conjunction with each other in ARs. For example, social welfare considerations were combined with sustainable economic development and also equity. At the same time, also climate change mitigation was juxtaposed with economic development, and even local sourcing was addressed from the perspective of supporting local economic growth as well as to contribute to equity. Therefore, we conclude that albeit sustainability expectations stem from different perspectives, some fits between these are evident. Through local sourcing, both the societal and beneficiary perspectives of contextual expectations are supported, and vice versa, the societal expectation of social welfare contributes to also the beneficiary expectation of equity. Similarly, if local sourcing includes beneficiaries into a programme, their empowerment can be supported, linking the organisational

structure with the subsystem. Local partnerships have also been seen as facilitating access, which is a further fit between the organisational subsystem and context.

Other fits are surprisingly lacking from being addressed in ARs. Such is the missing discussion of needs fulfilment, turning to the fulfilment of programmes or missions instead. Ideally, fulfilling a programme of course contributes to needs fulfilment as well, though this alignment would need to be studied further. Generally, whilst we found some fits between the various expectations, further research is needed to develop also performance indicators that would support the fit between context, subsystem and structure. This would also further the understanding how the fit between the organisational setup both in terms of structure and strategy fit with the humanitarian context that is characterised by uncertainty.

ICRC (2010) and UNPD (2010/11) bring up sustainability itself as a performance objective. Both organisations seem to have a societal perspective on sustainability discussing it through the natural environment and long-term development. Overall, the contextual expectations from the beneficiary and societal perspectives were addressed the most, whilst there was a relative lack of representation of aspects of the programme perspective, including aspects of resource utilisation and LRRD. The supply chain perspective representing the operational aspects such as preparedness and greening did not come up much except for local sourcing. The contextual focus is very visible in how HOs address the ecological dimension of sustainability: Whilst little attention is paid to greening products, services, or operations, climate change adaptation is considered for the livelihoods of beneficiaries and in the search of coping and mitigation strategies. This is in line with Sarkis *et al.*'s (2011) finding that HOs focus on people first, and the environment second.

Further research is though needed to identify greening initiatives, since ARs may not have captured every initiative that has taken place in the studied organisations. Such further research could also focus on identifying best practices both of such humanitarian activity where sustainability has been the primary objective, as well as such humanitarian operations in which greening the supply chain had been prioritised. Annual reports may also not have captured differences in the understanding of sustainability within and across HOs. Differences in its understanding may stem from

the organisational level (headquarters or field), mandate (development aid or disaster relief), and business model (delivering supplies or services). Further research is needed not only to find a fit between substructure, structure and strategy, but also to outline a path or method to achieve a fit between humanitarian and sustainability objectives. This could be done via analysing, which supply chain functions and activities affect sustainability objectives, which in the commercial sector are identified as e.g. supply chain network decisions, procurement decisions and decisions related to transportation.

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Appendix 1: Environmental indicators (ECORYS, 2012, p.6)

UN (UNSD)	World Bank	World Bank	Global Footprint Network	OECD	UN (UNEP)
System of Environmental-Economic Accounts (SEEA)	Adjusted Net Savings (ANS) – World Bank	WAVES -World Bank	Ecological Footprint - Global Footprint Network	OECD green growth indicators	UNEP Green Economy Initiative (GEI)
A methodology to incorporate the environment into national economic accounts.	A measure that attempts to better reflect the sustainability of a national economy by looking at depletion and investment in capital, including natural resource capital.	Awareness-raising to introduce the practice of ecosystem valuation into national accounts at scale so that better management of natural environments becomes business as usual.	A resource accounting tool which measures how much land and water area a human population requires to produce the resource it consumes.	Indicator system consisting of four indicator groups (approx. 25 indicators) with the aim of sending clear messages to policy makers and the public at large.	A framework for environmental indicators to identify key (sectoral) indicators of air, water, land and biodiversity.

APPENDIX 7 ESSAY 4

Haavisto, I (2012), "*Disaster impact and country logistics performance*". in Relief Supply Chain Management for Disasters: Humanitarian Aid and Emergency Logistics. IGI Global, Hershey, s. 208-220.

Chapter 12

Disaster Impact and Country Logistics Performance

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ABSTRACT

The study in this chapter seeks to answer the question whether a country's logistics performance has a correlation with the impacts of a disaster; impact being measured in average amount of affected, the average amount of deaths, the average amount of injured in a disaster or the average amount of economic damage. This is a quantitative study where the EM-DATs disaster data is analyzed through correlation analysis against the World Bank's logistics performance index (LPI). The findings do not show a significant relationship between countries LPI and the average number of deaths or injured persons in a disaster. A positive correlation between the variable LPI and the variable economic damage can be found. A negative correlation between the LPI and the average amount of affected can be found for countries with an average ranking LPI. Countries with low LPI and high disaster occurrence are further identified. Findings encourage the identified countries to take into consideration their logistics performance when planning and carrying out humanitarian response operations. Results also encourage humanitarian organizations to pay attention to the receiving countries' logistics performance in planning and carrying out humanitarian response operations.

INTRODUCTION

Each country or area has a different logistics performance in e.g. transporting goods. Accord-

ing to Hausman *et al.* (2005) it can take 93 days to export a 20-foot full container load (FCL) of cotton apparel in Kazakhstan while in Sweden it takes only 6 days. A country's logistics performance affects the country's trade competitiveness (Arvis *et al.* 2010), but is there an effect as

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well on a country's ability to transport goods in the event of a disaster? A country's capacities to handle the effects of an event are fundamental in the determination whether an event is a disaster or not. It's fundamental since the effects of an event are not determined as a major disaster as long as a system or a nation has the capabilities to cope with the effects of the event. (Kovács and Spens 2007). A country's logistics performance is therefore important knowledge for humanitarian organizations in order for them to know when and if their assistance is needed.

A country's own capacity to handle a disaster is seen to affect the impact of the disasters (Beresford and Pettit 2009). In the first 72 hours the affected country is most likely responsible for handling the effects of the disaster singlehandedly. In the case of an event where immediate relief is required, humanitarian organizations have in average the aim to reach the affected area within 72 hours of the disaster occurrence. And, when humanitarian organizations arrive on location, they still rely heavily on the resources in the country: can supplies and other resources be found locally and what kind of infrastructure is in place in the affected country? In recent years, humanitarian organizations' planning and preparing for disasters has improved (McEntire 1999) but an increased capacity building for country's own planning has not been seen.

Countries' logistics performances vary and there are several different measurements in use for determining performance. There are variations in the level of infrastructure and large variations as well in country specific policies and procedures which in the commercial sector affect the trade competitiveness (Hausman *et al.* 2005). A country's trade competitiveness has in empirical studies been found to have a statistical link with the country's logistics performance. The link has been found between transport cost and trade flows, and between the quality of the infrastructure and transport costs (Hausman *et al.* 2005; Limao and Venables 2005). The logistics performance of a

country could be likened to the timeliness and cost in a humanitarian response operation in a similar manner it is linked to trade competitiveness. The logistics performance in a country might even have a larger significance for the humanitarian sector than for the commercial, since a disaster is determined by time and place uncertainty and the outcome of the operations is measured in lives (Kovács and Spens, 2007). In a relief operation the logistics performance of the affected country might therefore be crucial in successfully accessing and aiding the ones affected by a disaster.

IS THERE A CORRELATION BETWEEN DISASTER IMPACT AND COUNTRY LOGISTICS PERFORMANCE?

This study compares countries' logistics performance with the impact of occurred disasters. The aim is to analyze whether a country's logistics performance has a correlation with the average amount of affected population, the average amount of deaths, the average amount of injured or the average amount of economic damage per disaster.

The secondary aim of the study is to identify countries where disasters are re-occurring or where a high number of people are affected by the disasters and where the logistics performance is low. For example, between 1990 and 1998, approximately 94 per cent of major natural disasters and more than 97 per cent of all natural disaster-related deaths occurred in developing countries (World Bank 2001). Developing countries also have in average a lower logistics performance than developed countries when calculated in relation to income per capita (Arvis *et al.* 2010). In this study three hypotheses are tested through correlation analysis.

Hypothesis 1: There is a negative correlation between country logistics performance and disaster impact (low country logistics

performance correlates with high disaster impact; high country logistics performance correlates with low disaster impact.)

Hypothesis 2: The correlation between country logistics performance and disaster impact differ depending on the level of logistics performance (high, medium, low).

Hypothesis 3: The correlation between country logistics performance and disaster impact differ depending on used disaster impact measurement (affected, dead, injured, economic damage).

The first hypothesis states that there would be a negative correlation between the two variables, which would mean that low performance indicator correlates with high disaster impact and high logistics performance. The second hypothesis states that depending on where in the logistics performance ranking the country is, the correlation might differ. E.g. if the country is in the group of low performers the correlation might be very significant, but in the group of high performers there might not be a significant correlation at all. The third hypothesis again states that depending on which measurement for disaster impact is used the correlation might differ. This means that there might be a correlation detected between the logistics performance and the total number of affect but e.g. not between logistics performance and number of injured.

The practical indication with this study is to see whether a low logistics performance correlates with the impact of a disaster. The practical implication of the study is as well to indicate which areas might be disaster prone and have a low logistics performance and therefore might need a larger focus on country preparedness and humanitarian organizational preparedness to tackle the impacts of a disaster.

WHY IS LOGISTICS IMPORTANT IN DISASTER RESPONSE?

Logistics performance has been proven to have an impact on trade competitiveness but why is it important in disaster response? The commercial supply chain can be seen as a process of managing the flow of goods, information and finances from the source to the final customer. Similarly to commercial logistics operations, logistics in disaster response struggle with conflicting interests of stakeholders and with unpredictable demand. There are differences between humanitarian logistics and commercial logistics. The most essential difference can be seen as the motivation to improve the logistics operations (Kovács and Spens 2007). The motivation for private companies comes from being monitored and measured by profitability, but in the case of humanitarian logistics the output of the performance could be measured in human lives.

Disaster response is characterized by numerous factors of uncertainty which do not exist in the commercial sector. In most cases, the beneficiaries, their location and their needs are unknown. A relief operation is therefore characterized by demand uncertainties in the form of location, type and volume (Beamon and Balcik 2008). This uncertainty and unpredictability leads according to Beresford and Pettit (2009) to the relief operations being reactive rather than proactive, which would mean that the response operations are seldom prepared for. Beamon and Balcik (2008) further argue that the unpredictability of a disaster makes the planning and preparing even more important. The lack of preparedness in the humanitarian sector can be due to the unpredictability of the event, or due to the affected countries not having capacity for disaster preparedness and/or organizations not having funds allocated for planning. Organizations rarely have funds for planning and preparing since donors are hesitant to provide funds in advance to humanitarian organization in the fear of them “spending the money on heavy administration”,

instead of saving lives. Countries again, especially developing countries might also not have resources for disaster prevention and preparedness. Bringing to mind that emergencies often take place in less developed areas with poor infrastructure (Jennings *et al.* 2000; Beresford and Pettit 2009). Kovács and Spens (2009) emphasize that it is crucial for a humanitarian operation to know what the preparedness level of the pre-disaster area is. Part of the area preparedness level can be viewed as terms of infrastructure such as road network, access points, electrical grid and medical centers in the region. Because of the uncertain characteristics of a disaster, logistics performance and especially country preparedness and organization preparedness seem crucial in humanitarian response.

Preparedness

Preparedness means planning how to respond when an emergency or disaster occurs. The most important part of the preparing is to get to know the area, recognize the risks and and plan how to respond in that particular setting. Planning for a disaster is often focused on developing the capacity to respond. Disaster preparedness focused on developing the capacity to respond quickly and appropriately to a disaster is according to Perry (2007) the foundation of all relief activities. Preparing or planning can save lives and minimize the damage of a disaster. The impact of a disaster can be reduced by setting up warning systems and by effective disaster management. To respond properly, an authority must have a plan for response, trained personnel to respond, and the necessary resources with which to respond (Oloruntoba 2005; McEntire 2002).

Certain disaster prone areas are very prepared to meet a disaster. Iceland, Japan and New Zealand are good examples of high mitigation. The areas are prone to earthquakes, but have a good possibility of predicting an upcoming event and have a high level of local preparedness. In other areas such as on the African continent there is a pattern

of slow on-set disasters and lack of preparedness for these sorts of disasters. Slow onset disasters are disasters such as famine, drought and poverty; while rapid onset disasters can be hurricanes, earthquakes and tornados (van Wassenhove 2006). The characteristic for a slow onset disaster is that they sneak up slowly while the rapid onset ones are often unpredictable. One might think that countries and organizations would have more time to plan and prepare for a slow onset disaster but since the disaster often develop for a long period of time the same drama and media attention is seldom involved in slow onset disasters as for a sudden onset-one. There is not too much humanitarian logistics research on preparedness or response for disasters on the African continent. The majority of all research in humanitarian logistics concerning disasters and disaster preparedness has been conducted in Asia (Beresford and Pettit 2009; Kovács and Spens 2009). This is logical in the sense that 60 percent of the world's disasters take place in Asia. Amin and Goldstein (2008) claim that there is a strong relationship between vulnerability, poverty and natural disasters. The statistics do not show a higher level of disasters occurring in developing countries but the impact if measured in deaths is higher. 11 percent of the people being exposed to natural disasters live in developing countries but the disasters occurring in developing countries account for 53 percent of the recorded deaths.

In spite of where in the world a disaster occurs, preparedness plays a crucial role in the possibilities to respond to the disaster. Part of being prepared is good logistics performance in the country or the area of the disaster and availability of resources such as infrastructure, supplies. Part of being prepared as a humanitarian organization is to have the knowledge of a country's logistics performance. Even if the logistics performance is seen as an important factor for disaster preparedness, does the performance have a correlation with the disaster response and the impact of a disaster? In

the following sections we will discuss countries' logistics performance, the possibility to measure it.

Logistics Performance

In research, logistics performance is often referred to as the logistics performance of a company, organizations, a supply chain or a supply chain network. In this study we are however looking at country specific logistics performance. There is a limited amount of research conducted on country specific logistics performance, but there are indicators developed to measure that performance. Logistics performance indicators and different indexes are used to indicate what a country's logistics performance is. There are several different types of performance indicators and several different factors that are included in the calculation. Logistic performance indicators are often indicators that are calculations of different factors that influence the logistics performance in the area. Indicators of time, indicators of costs and indicators of complexity and risk factors can be included (Hausman *et al.* 2005).

Existing indexes that measure the logistics performance that are currently used in research and by practitioners are e.g. The Port Infrastructure Index, The Port Efficiency Index, The Transport Cost Index (Clark *et al.* 2004), Cargo Handling Restriction Index (Fink *et al.* 2002), The European Freight Forwarding Index, Global Competitiveness Index and Global Enabling Trade (Karamperidis *et al.* 2010). They all measure different logistics actions, and are used for different purposes and studies. The Port Infrastructure Index e.g. measures the ratio between the number of ports per country in relation to the country's surface and population.

The logistics indicator chosen to be used in this study is published by the World Bank 2010 and constitutes of data gathered in 2009. The indicator is one of the broader logistics performance indicators since it includes measures for; customs, infrastructure, international shipment, logistics competence, tracking and tracing and domestic

logistics. As discussed in the introduction the logistics performance in a country is seen to have direct link with trade competitiveness, efficient logistics play an important role in the worldwide flow of goods and services. Dollar *et al.* (2004) state for example that firms in countries with better logistics have a higher probability of attracting foreign direct investment. Logistics inefficiencies again harm the competitiveness through their effect on both time and cost. These affects have been the trigger for the World Bank to develop the Logistics Performance Indicator, where countries' logistics performance is evaluated and ranked. The World Banks Logistics performance index (LPI) is studied to be directly linked to important economic outcomes, such as trade expansion and growth (Arvis *et al.* 2010). The aim of ranking the logistics performance of countries is according to the World Bank (2010) for the indicators to serve as a catalyst for domestic policy reform.

There are several ways to measure country logistics performance. All above mentioned indexes have their own purpose and should be used accordingly. The World Banks LPI is one of the broadest indicators and is therefore chosen to be used in this study. But what about measuring the other variable in this study; disaster impact? There is no disaster impact index available, but there are several different measurements which can indicate the disaster impact. The following section will discuss the different sources of disaster impact data.

Disaster Impact

All disasters, in spite of classification or type, have a common denominator: the severe impact they have on people's lives, properties and the environment (Shaluf 2007). But how can that impact on peoples' lives be measured? An industrial accident might have a high economic impact while a predicted hurricane might drive people to evacuate and an unpredicted earthquake might cause injuries and casualties.

Researchers have tried to quantify a disasters impact on the population and on a nation's development. The damage caused by a disaster is seen to not only have an immediate impact on peoples' lives but also a long term negative impact on a country's economic development. The immediate impact is by Sharma (2010) be separated into direct impact; such as physical and human capital and indirect impact; on capital flow and on production, consumption, income and employment.

To be able to measure the impact of a disaster one must recognize the different characteristics and types of disasters. Disasters can be divided into several categories according to their characteristics. Disasters can be divided into disaster sub-groups such as geophysical, meteorological, hydrological, climatologically and biological disasters (EM-DAT, 2010). In humanitarian logistics literature the most common distinction between disasters is; man-made disaster and natural disaster (van Wassenhove 2006; Kovács and Spens 2009) or as mentioned in the introduction slow onset disasters (famine, drought and poverty) and rapid onset disasters (hurricanes, earthquakes and tornados). The predicted impact of a disaster can be measured in magnitude for example on the Richter scale for earthquakes, or the Saffir-Simpson Hurricane Damage Intensity Scale for hurricanes. For an industrial accident such as for example an oil spill, the environmental impact is often measured. The most common way of measuring the impact of a disaster is to measure post-event variables.

There exists a variation of databases that gather data on disasters and on disaster impact. These are; EM-DAT Database, NatCat Database, Sigma Database, Disaster Database Project and regional or local disaster databases. The EM-DAT database is maintained by The Centre for Research on the Epidemiology of Disasters. The database is meant to be used to for example to determine whether an event is a disaster or not and whether the impact of the event requires aid. The information has been gathered since 1900 (EM-DAT, 2010). The NatCat database again gathers post-event data on

property damage and whether persons are injured or dead. The database is maintained by Munich Reinsurance Company since 1970 for insurance purposes (Guha-Sapis and Below 2002). The Sigma Database was set up for similar purposes as the NatCat database. In this study the EM-DAT database data is used because of the broadness of data included in the database, and because the data is fully available to the public. The EM-DAT has though been criticized for only gathering data on the direct affects of a disaster (Sharma, 2010). The direct affects do not necessarily take in consideration the the full scale of the disaster impact, such as longer term social and economic impact as the impact on the structure of economy, on social and behavioral considerations, and on political and institutional factors.

This study seeks to find out if there is a similar link between LPI and disaster impact as there is between the LPIs and trade competitiveness. In the following section the method of the study and the used variables are discussed.

Research Design

Statistical data is used to analyze disaster impact and the logistics performance through a correlation analysis. The analysis is used to seek a correlation between the logistics performance in a country and the disaster impact. Three hypotheses were formed; there is a negative correlation between logistics performance and disaster impact, the correlations differs depending on the level of logistics performance (high, medium, low), the correlation differs depending on used disaster impact measurement (affected, dead, injured, economic damage).

The data used to measure the country logistics performance is the World Bank's LPI and the data used to measure the disaster impact is the EM-DAT disaster data.

When looking at the LPIs and the EM-DAT disaster occurrence data it must be kept in mind that the World Bank only calculates the LPI for

154 countries while EM-DAT gathers disaster data for all countries of the world. Because this study is looking at both data sources the countries that do not have a World Bank calculated LPI are not included in the study. Countries that are left out but who do have a high disasters occurrence rate are countries such as for example Central African Republic and Burundi. Furthermore because of the irregularity of disasters, data regarding disaster occurrence was used from a longer period of time (2000-2009) while the most recent data (2010) regarding the country's logistics performance was used.

A correlation analysis is conducted for all variables. Correlation analysis can be used to indicate a predictive relationship and can suggest possible causal relationships. Both Pearson correlation and Spearman's rank correlation is conducted. Pearson's correlation seeks to find linear correlations when Spearman's rank correlation measure if and to what extent one variable increases or decreases compared to another variable. The Spearman's rank correlation do not requires that the relationship is a linear relationship.

The variable that is chosen to indicate the country's logistics capacity is the World Banks LPI. The variables chosen to express the disaster impact are; the average number of affected, the average number of deaths, the average number of injured and the average economic damage. The average for the variables is calculated as total divided by occurred disasters.

Correlation analyses are as well conducted for low, average and high LPI groups separately. Further a correlation analysis for each LPI group and each disaster impact variable is conducted separately. The data is divided into these 3 LPI groups by dividing the total amount of 154 countries into equally sized groups (51 countries in the low and average LPI groups and 52 countries in the high LPI group).

In the following section the data sources are discussed in more detail. Thereafter the calculations and the results are presented.

The World Bank Logistics Performance Index (LPI)

The World Bank first started with the biannual Logistics Performance Indicators ranking in 2005. The data constitutes of detailed level data on time and cost to move a typical 20-foot container from the port of entry to a populous or commercially active city in the country. Measured activities are trade document processing, approvals needed for import and export transactions, customs clearance, technical clearance, inland transport, terminal handling and container security measures (Hausman *et al.*, 2005). The data was collected through a detailed questionnaire distributed to experienced logistics practitioners, mostly freight forwarders.

The data that is used in this study is from the World Banks logistics ranking from 2010. The LPI is rated from 1 (=worst) to 5 (=best). The 2010 LPI is a snapshot of the logistics performance in 154 countries. The World Bank LPI of 2010 constitutes of data regarding a country's; *Customs, Infrastructure, International shipments, Logistics capacity and competence, Tracking and tracing, and Timeliness* (Arvis *et al.* 2010). In disaster situations one of the indicators might be more important than others. In a sudden onset disaster "timeliness" might become more crucial than the other indicators and if the country eases up on their customs requirements due to the disaster, customs as an indicator might not be significant at all.

The LPI is proven to indicate a country's trade competitiveness but is it relevant in humanitarian response? Humanitarian response operations have many of the same challenges in moving relief and aid supplies to and from an affected area as a private company with trade in the area might have. There are differences as well. In a disaster situation countries for example tend to ease up on their customs regulations and entry into the country with relief supplies might be much quicker than with commercial goods. Also the LPI as calculated by the World Bank are only looking at the timeliness with the final destination

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in the country assumed to be a commercial hub, while relief supplies often need to be transported to remote areas. Since the disasters might occur in a remote area, the countries inland capacity becomes more crucial, than the capacity to import and export goods to commercial hubs.

Emergency Data Base Disaster Occurrence Data

EM-DAT classifies the disasters into following disaster types: complex, drought, earthquake, epidemic, extreme temperature, flood, industrial accident, insect infestation, mass movement dry, mass movement wet, miscellaneous accident, storm, transport accident, volcano and wildfire. In this study all disaster types are included. For disasters to be entered into the database one out of four disaster criteria must be met. The criteria are: ten or more people killed, hundred or more people reported affected, a declaration of emergency or call for international assistance. As can be seen in Table 1, the EM-DAT database includes data on number of deaths, number of people affected by disaster, number of people injured in the disasters and economic damage. The number

of deaths is by the EM-DAT defined as a person who is confirmed or presumed dead. Injured is a person who suffers from physical injuries, trauma or illness and requires medical treatment. A person who is affected by the disaster is one who needs immediate assistance; he or she can be a displaced or evacuated person. In year 2003 there was for example 37 million uprooted people in the world (Shaluf 2007). The estimated damage is given in US dollars and there is no standard procedure on how to determine the figure for the economic impact.

THE RELATIONSHIP BETWEEN LOGISTICS PERFORMANCE AND DISASTER IMPACT

High Disaster Occurrence and Low Logistics Performance

The country with most disasters occurring in average per year between the 2000 and 2009 is China with an average of 87.56 defined disasters per year (see table 1). China has a high LPI and a high risk of earthquake. Some of the world's most

Table 1. Top 10 disaster occurrence countries

Country	LPI	Average # disasters/ year	Average economic damage / disaster	Average # injured/ disaster	Average # affected/ disaster	Average # deaths/ disaster
China	3.49	88	230 645*	914*	1 489 054*	142*
India	3.12	44	62 115*	497*	1 554 490*	168*
US	3.86	34	1 132 407*	21	68 599*	18
Nigeria	2.59**	31	43	8	2 351	44
Indonesia	2.76**	28	50 496	619*	47 249	740*
Philippines	3.14	21	11 594	42	261 619*	61
Russian fed.	2.61**	19	26 433	25	11 840	27
Iran Isl. Rep.	2.57**	17	28 747	200*	253 931*	203*
Bangladesh	2.74**	17	39 489	522*	487 660*	93
Pakistan	2.53**	15	58 523	1 027*	148 311*	594*

(**. Lower LPI than total average; *. Higher than total average)

deathly earthquakes have taken place in China. One of the latest was the Sichuan earthquake in year 2008. The effects of the disaster were severe, with 68,712 casualties and an estimated economic damage of US\$120 billion (Sharma 2010). If the countries are prepared and the nature of the disaster is known, affected populations can be trained to respond to the disaster or to avoid the disaster altogether (Kovács and Spens 2009). In the case if the Sichuan earthquake the Chinese government could undertake the response operation by using soldiers from the National army and they could in a fairly short time access and aid the areas of the disaster.

In number of occurred disasters between 2000 and 2009, China is followed by India (average of 44 disasters/year) and United States (average of 34 disasters/year). All top three disaster occurrence countries have a higher than average LPI. These countries are also densely populated. China has a total population of 1.340 billion and 139 people per square kilometer, India has a total population of 1.180 billion and a population density of 361 persons per square kilometer and the United States has a total population of 310 million and a population density of 31 persons per square kilometer (UN 2010). What moreover needs to be kept in mind when looking at table 1, is that the disaster occurrence data in this study takes in consideration all types of disasters, not only natural disasters but also e.g. industrial accidents. The study entails all types of disasters since there can be similar requirements in the response operation and the disaster impact regardless of what sort the disaster is. The figures might look quite different if only looking at natural disasters since the top three countries are industrialized and have a high occurrence of industrial accidents and transport accidents as well as natural disasters.

Table 1 also shows that out of the 10 countries with most disasters occurring per year, 6 countries have a below average (2.86) LPI. Low logistics performer countries with a high disaster occur-

rence rate are Nigeria, Indonesia, Philippines, Russia, Iran, Bangladesh and Pakistan.

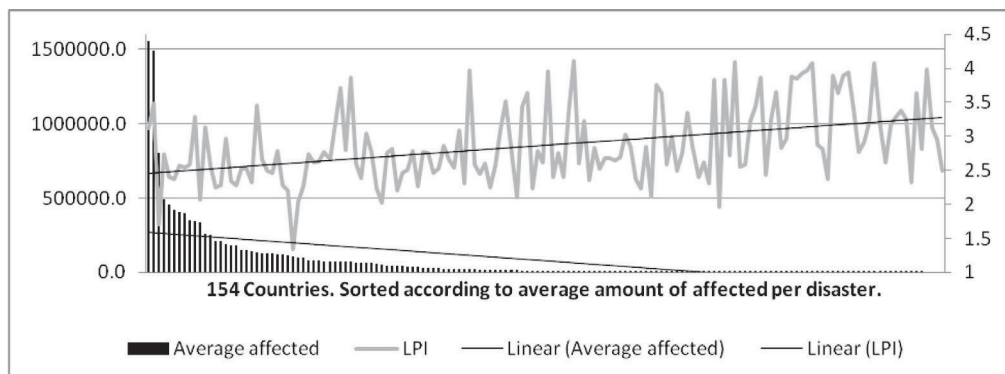
The table also shows that the disaster impact data seems to vary quite a bit. With the highest average amount of affect per disaster in India with 1.55 million affected in average per disaster, China with 1.48 million and Bangladesh with 0.48 million affected. Out of the disasters that have occurred between 2000- 2009 what further can be stated is that United States seems to have a high amount of economic damage, with Hurricane Katrina (2005) probably as one of the main factors. The sole economic damage from the hurricane is estimated as US\$125 billion (Amin and Goldstein 2008). Indonesia had a high number of its population affected in the tsunami of 2004 (Banomyong *et al.* 2009, Perry 2007, Régnier *et al.* 2008). Pakistan again has been hit with re-occurring earthquakes both in year 2005 (Kashmir) with 80 000 deaths and 2008 (Balochistan) which left 150 000 people homeless. (EM-DAT 2010)

Figure 1 shows the average amount of affected per disaster for all (154) countries as well as the LPI for these countries. The countries are sorted in order of the variable average amount of affected per disaster. What can be seen in the figure is that there seems to be a slight increasing trend line for LPI compared to the decreasing trend line for the average amount of affected. That would indicate that when the countries are sorted from high to low average amount of affected, the LPI seems to decrease to a minor extent. This would mean that there could be relationship where the higher the amount of affected per disaster the lower the LPI is.

The countries that stand out as such with a low LPI and high disaster occurrence or high disaster impact can be seen in Table 2. The table shows the lowest ranking logistics performers. Somalia, Nepal and Sudan are such countries that have a low LPI and a higher than average disaster occurrence rate. Sudan also has a higher than average number of people affected by disasters. Sudan has been distressed by a civil war since 1983

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Figure 1. Trend line (all 154 countries) for LPI and the disaster impact variable average affected



leaving over two million dead and over four million displaced (Beamon and Kotleba 2006). The four million displaced people in Sudan are accounted for in the variable affected per disaster.

Out of the countries with a low logistics performance Eritrea, Rwanda and Cuba do not have a very high disaster occurrence rate, but they do have a high number of people who in average were affected by the disasters that did occur. Eritrea's population was affected by disasters since it was in war with Ethiopia 1993-2000 when

the population was affected by famine and displacement. Eritrea was also hit by drought in 2008 (Devereux 2009). Rwanda again has had a limited amount of natural disaster in the years 2000-2009, there are some landslides, flooding, drought, epidemics, road accidents, forest fires and social conflicts. The reason that Rwanda has such a large amount of people affected by disaster (see Table 2) is probably due to the displacement and resettlement that has taken place still between 2000 and 2009 as a result of the 1994 genocide and

Table 2. Bottom 10 logistics performers (2010) and disaster occurrence (2000-2009)

Country	LPI	Average # disasters / year	Average economic damage / disaster	Average # injured / disaster	Average # affected / disaster	Average # deaths / disaster
Somalia	1.34	6.1*	1 818	9	10 541	58
Eritrea	1.70	0.6	-	9	801 409*	11
Sierra Leone	1.97	1.9	-	4	1 383	56
Namibia	2.02	1.9	499	-	48 939	20
Rwanda	2.04	2.1	-	48	102 444*	22
Cuba	2.07	3.2	259 349*	10	339 292*	7
Guinea-Bissau	2.10	1.4	-	0.8	13 344	57
Iraq	2.11	2.7	54	44	3 256	64
Nepal	2.20	6.6*	1 164	20	44 643	62
Sudan	2.21	7.9*	6 845	15	112 447*	54

(*). Higher than average)

war. Rwanda was also affected by the “Second Congo War”, which took place between 1998-2003, and an erupting volcano on the border to Democratic republic of Congo - both which lead to displacement of people (UNISDR 2010).

Cuba again has had re-occurring hurricanes; with the most severe ones, hurricane Ike and hurricane Gustav in 2008. These two hurricanes caused an evacuation of 3 million people, they left 200 000 Cubans homeless and the calculated property damage amount up to 9.4 billion US dollars. Cuba is one of the countries with a sufficient disaster prevention system in place and therefore the disasters that hit the country, in spite of their magnitude, seldom cause a large loss of lives (Keyser and Smith 2009).

Logistics Performance Indicators Correlation with Disaster Impact Variables

To test the hypothesis of the study, correlation analyses were conducted for the variables. The variable LPI was seen as the dependent variable since the data is normally distributed and the disaster impact variables as independent ones. Spearman’s correlation and Pearson’s correlation was carried out.

Potential outliers could be the countries with a high population density. Countries such as China, India and United States could already in the previous chapter been seen to stand out in the descriptive statistic with having a high disaster occurrence and a high amount of people affected by the disasters (see Table 1).

The results (see Table 3) are somewhat similar for all disaster impact variables; no significant correlation could be seen between the LPI and the variables average affected, average injured and average deaths. But a somewhat significant relationship could be detected between the LPI and the variable economic damage.

The only disaster impact variable that does show a 99% significant correlation is the variable economic damage. The correlation between the LPI and economic damage is positive with a Spearman’s correlation coefficient of 0.45 and 0.46 for Pearson’s. This relationship is therefore linear. The relationship between the LPI and the economic damage is positive which indicates that the countries with a higher logistics performance tend to as well have a larger economic damage measured in dollars per disaster exactly opposite to what the first hypothesis states. The found relationship could be explained by the fact that the higher logistics performers tend to have a higher GDP and therefore these countries tend to have more economic resources that can be damaged in a disaster. The first hypothesis stating that there could be a negative correlation between LPI and disaster impact variables is proven false for all variables.

Countries with Low, Average or High LPI

When correlations are calculated for countries with a low (ranking: 1.38- 2.57) LPI, the same results cannot be detected (see Table 4). There is no significant relationship between the variable LPI and the variable economic damage. This seems

Table 3. Correlations between LPI and disaster impact variables

	LPI	Average Affected	Average Injured	Average Death	Average Damage
Spearman’s Correlation	1.00	0.04	0.01	0.09	0.45*
Pearson’s Correlation	1.00	0.01	0.03	0.07	0.46*

(*p < 0.01)

Disaster Impact and Country Logistics Performance

to indicate that the LPI and economic damage correlation that could be seen in the correlation analysis for all countries cannot be detected when looking at countries with low indicators. This might be due to the fact that low LPI countries tend to have a lower economic development level and could perhaps have less economic resource that can get damaged by the impacts of a disaster.

For countries with an average (ranking: 2.58-2.99) LPI there can neither be found a significant relationship between a country's LPI and the economic damage as could be seen for all countries. There can though be found a 95% significant negative correlation (Spearman's correlation coefficient -0.347) between LPI and the variable average total affected. That would mean that in the countries with a higher LPI there seems to be less average affected per disaster. The relationship is not linear since Pearson's correlation shows no significant correlation. The results from Spearman's correlation would prove the first hypothesis correct meaning that for such countries that have an average LPI, there seems to be a negative correlation between the LPI and the average affected. The higher the LPI the less number of people seem to be affected in average per disaster.

Countries with a high (3.02-4.11) LPI show the same correlation with a 99% significance, between

LPI and the variable economic damage as could be detected in the correlation for all countries. For the countries with a high LPI there seems to be correlation, the higher the LPI, the larger the average economic damage per disaster. This relationship is linear.

FUTURE RESEARCH DIRECTIONS

Logistics performance is determined in this study to somewhat correlate with disaster impact and it would be valuable to further analyze this statement, since the direct negative correlation that was sought after with the first hypothesis could not be directly proven. Further research should test the hypothesis with a broader set of variables e.g. taking in account population density and country economic development. The study could as well be conducted by only taking in consideration natural disasters, since some types of disasters such as e.g. industrial accidents might have a different impact on the area and population and the humanitarian response operations might differ to some extent from the response to a natural disaster. Further a regression analysis could be conducted with the LPI as a dependent variable and all the variables in the study and the above mentioned variables

Table 4. Correlations for low, average and high LPI

	Low LPI	Average Affected	Average Injured	Average Deaths	Average Damage
Spearman's Correlation	1	-0.052	-0.149	-0.143	0.288
Pearson's Correlation	1	-0.083	-0.197	0.017	0.050
	Average LPI	Average Affected	Average Injured	Average Deaths	Average Damage
Spearman's Correlation	1	-0.347**	0.029	-0.044	0.093
Pearson's Correlation	1	0.037	0.032	0.016	0.000
	High LPI	Average Affected	Average Injured	Average Deaths	Average Damage
Spearman's Correlation	1	-0.097	-0.073	0.128	0.476*
Pearson's Correlation	1	0.039	-0.194	0.167	0.512*

(* p < 0,01, ** p < 0.05)

accounted for as independent variables. It would also be valuable to measure whether the level of preparedness in a country correlates with the disaster impact. Could there be found a correlation between the level of preparedness in a country and the disaster impact variables average amount of affected, average amount of deaths and average amount of economic damage?

Further research could also be conducted on the logistics performance indicators and whether they can serve as measurement for country logistics performance. Logistics performance in humanitarian settings could as well be further studied.

CONCLUDING DISCUSSION

This study aimed to analyze the relationship between the logistics performance in a country and the disaster impact. The primary aim was to analyze the relationship between countries' logistics performance and the disaster impact, this relationship showed no significant relationship for all countries between the LPI and variables; average amount of affected, average amount of injured and average amount of deaths. A significant relationship between the LPI and average amount of affected could be found when only analyzing countries with average LPI. For these countries there is a significant negative relationship, which indicates that countries with a higher LPI tend to have a lower amount of affected per disaster. Countries in the group of average LPIs with an LPI on the lower side of that group therefore tend to have more people affected per disaster than countries with a higher LPI in that group. This result aligns with the first hypothesis of the study.

The analysis did as well show a relationship between the LPI and the variable average economic damage. The relationship is positive which indicates that the countries with a higher logistics performance might have more resources that can be and are damage in the course of disaster. This correlation could with a high significance be detected

for countries with high LPI as well. For countries with low or average LPI there seemed to be no correlation between the logistics performance and the disaster impact variable economic damage. Amin and Goldstein (2008) though claim that the economic burden is proportionally much higher in poor countries, which are also the countries with low logistics performance (Arvis *et al.*, 2010). So if the variable economic damage would be proportioned against a country's economic development the results might be different. The economic loss for example from Hurricane Katrina amount to only 0,1 percent of United States gross domestic product. While the UNISDR (2004) calculates that the economic losses due to disasters occurred in the past twenty years in developing countries account for between 134 and 378 percent of the countries' gross domestic product.

The results show no direct correlation between a country's logistics performance and the other disaster impact variables (deaths, affected, injured) when looking at all countries. But when analyzing only the countries with average LPIs an interesting relationship between the LPI and the average amount of affected could be detected. In this group of countries, the level of logistics performance and the disaster impact correlate with 95 percent significance according to Spearman coefficient. The results indicated that the higher the logistics performance the lesser the disaster impact and the lower the logistics performance the higher the disaster impact measured as number of people affected by a disaster. None of these relationships could be seen when analyzing the low LPI countries which also tend to be the countries with the highest disaster occurrence. For these countries it seems like there are other variables that are crucial to take inconsideration in disaster response. It might also be that for the countries with a low LPI, humanitarian organizations take a larger role in the disaster response than they do for the countries with an average LPI and therefore the relationship with the countries logistics

performance and average amount of affected cannot be seen.

As the third hypothesis stated, the correlation differ depending on which disaster impact variable was used. For the variables average number of injured and average number of death there was no correlation with the LPI found. For the disaster impact variable economic damage a correlation could be detected for all countries and for the disaster impact variable total amount of affected a correlation was found for the group of average LPI countries. The disaster impact can differ depending on what type of disaster is in question and where the disaster occurs. For example in the case of a slow onset disaster people might have time to prepare and even evacuate and therefore the number of injured or dead might not be high, but there could be a high number of people who are affected. On other hand, in the case of a rapid onset disaster in a highly populated and economically developed area the economic damage could ascend.

The second and third hypothesis could be confirmed since the results differed depending on the group of LPI (low, average and high) and depending on which disaster impact variable was used.

The secondary aim was to identify areas with a high disaster occurrence rate and low logistics performance. Countries with a high disaster occurrence rate and a low logistics performance level are: Somalia, Nepal and Sudan. Countries with low logistics performance and a higher than average numbers of people affected per disaster are Eritrea, Rwanda, Cuba and Sudan. All these countries have been hit by both natural and complex emergencies between 2000 and 2009. The population might have been affected by war or political disturbance (Somalia, Eritrea, Rwanda, Sudan) or natural disasters (Nepal and Cuba). Since the LPI is calculated with measurements for e.g. customs, it is important to keep in mind when analyzing the results for example for Cuba that the inland transportation has a fairly high level of performance while the customs cause

a lengthy wait for exports and imports to Cuba and therefore Cuba's ranking as a low logistics performance might be a bit misleading.

As practical implication, increased disaster preparedness in areas with high disaster occurrence and low logistics performance is suggested. Country preparedness is crucial in those areas where the disasters are re-occurring. While country preparedness could be emphasized in areas where natural disasters re-occur, humanitarian organizations should focus a high level of preparedness to handle the aftermath of disasters in such areas that are conflict prone and that have high disaster occurrence and low logistics performance. The results from this study can be used by countries to identify themselves as disaster prone and as low logistics performers. Humanitarian organizations again could use the logistics performance indicators in their planning so that their humanitarian logistics planning (e.g. lead time and transportation planning) could account for the differences in the logistics performance in affected countries.

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KEY TERMS AND DEFINITIONS

Disaster Impact: The direct or indirect impact that an event classified as a disaster have on people's lives, properties and the environment.

Disaster Occurrence: Amount of disaster occurred in a particular time. The EM-DAT disasters are entered in the database by event and by country.

Humanitarian Response Operation: Responding (a country or an organization responding) to an event or circumstance where humanitarian assistance is needed, both humanitarian relief operations and development aid programs.

Logistics Performance Index (LPI): The by the World Bank measured LPI a multidimensional assessment of logistics performance, rated on a scale from one (worst) to five (best).

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IRA HAAVISTO

PERFORMANCE IN HUMANITARIAN SUPPLY CHAINS

The goals of humanitarian organizations are to save lives, decrease human suffering, and contribute to development. However, humanitarian response has been criticized for its lack of positive impact on the societies receiving aid, or more precisely, for the lack of the effectiveness of the aid. Discussion of the effectiveness of aid has seemingly been incorporated at the operational level as focus on cost and time efficiency. However, efficiency considerations have been criticized because they can lead to oversight of other considerations, such as sustainability. Humanitarian practitioners have started paying attention to measuring their performance. Measuring the performance of humanitarian operations, however, can be cumbersome, due to the complexity of the operating environment, which has limited data accessibility and multiple actors involved.

This thesis' overall aim is to analyze how supply chain performance is understood in the humanitarian context. The research questions are deliberated on in four essays. Each essay has a different scope, ranging from an intra-organizational supply chain perspective to a macro perspective on country logistics performance. This thesis builds mainly on the literature about humanitarian supply chain and its performance measurement. To date, the performance literature in the humanitarian context has covered different performance measurement frameworks and suggested specific key performance indicators. However, it has not yet tackled the essence of performance measurement, which should be connected to the goal of the activity at hand and support learning and development.



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