INTRODUCTION

Relief supply chains are argued to be the most dynamic and agile supply chains, yet research in this area of supply chain management (SCM) is scant. Relief SCM has recently gained attention due to many natural and man-made disasters and the recognition of the central role of logistics in responding to these. Relief supply chains (SC) constitute a substantial industry that responds to over 500 disasters annually resultant in loss of 75 000 lives and affecting over 200 million people. SC costs are also argued to account for over 80% of costs incurred in any disaster relief operation. Due to the fact that relief supply chains so far have received little attention, there seems to be a gap that this book can fill.

The anthology also presents a continuation of a doctoral course in Supply Chain Management for Disaster Relief given at Hanken School of Economics in the fall of 2009, as many of the chapters are written by participants, as well as core faculty of this doctoral course. The book is therefore a collection of chapters by researchers, both junior and senior, in the field of humanitarian logistics and relief supply chain management. The chapters were, however, submitted after a broader call for papers and were thereafter peer-reviewed, ending up as a collection of chapters that were accepted. The interest for courses in this field has continued to grow since; therefore, the hope is that this anthology will provide a platform for creating and giving even more courses in the field. More broadly, the anthology is part of a large research project funded by the Academy of Finland, called Relief Supply Chain Management.

The overall aim of the anthology Relief Supply Chain Management for Disasters: Humanitarian Aid and Emergency Logistics is to further the understanding of SCM in disaster relief. As the first book in this field, the hope is that it will serve scholarly thought as well as provide a textbook for courses introducing this new and exciting area in the field of logistics.

BACKGROUND

Supply chain management (SCM) research has developed rapidly in the past two decades, but is still “a discipline in the early stages of evolution” (Gibson et al., 2005, p.17). The following most commonly used definition of SCM is provided by the Council of Supply Chain Management Professionals (CSCMP):

‘Supply Chain Management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all Logistics Management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers. In essence, Supply Chain Management integrates supply and demand management within and across companies’ (CSCMP, 2006).
Traditional streams of SCM literature encompass different topics, ranging from supply chain modelling and optimisation (Lee et al., 2004; Svensson, 2003) to supply chain performance measurement (Bagchi et al., 2005; Beamon, 1999), supply chain processes (Croxton et al., 2001; Lambert et al., 1998), portfolio models in SCM (Fisher, 1997), and supply chain collaboration and integration (Barratt, 2004; Fawcett & Magnan, 2002; Min et al., 2005). Portfolio models in SCM discuss different types of supply chains, contrasting supply chains for functional products with a focus on cost efficiencies to supply chains for innovative products with a focus on responsiveness to market dynamics (Fisher, 1997). But while this portfolio thinking is at the core of SCM, literature has traditionally focused on efficient (or “lean”) supply chains only (Lee, 2004). Therefore, the current trend in SCM literature is towards discussing more innovative and responsive – or “agile” – supply chains that operate in a highly dynamic environment (Christopher et al., 2006; Towill and Christopher, 2002).

Relief supply chain management has recently gained attention due to a number of natural and man-made disasters and the recognition of the central role of logistics in responding to these. Oloruntoba and Gray (2006, p.117) argue that relief supply chains are “clearly unpredictable, turbulent, and requiring flexibility.” In essence, relief supply chains can be seen as highly dynamic, innovative, and agile (Oloruntoba & Gray, 2006; van Wassenhove, 2006), and hereby it can be argued that even (traditional) commercial supply chains can learn from the high flexibility of relief supply chains (Sowinski, 2003). Especially in sudden-onset disasters, relief supply chains have to be deployed in situations with a destabilised infrastructure and with very limited knowledge about the situation at hand (Beamon, 2004; Long & Wood, 1995; Tomasini & van Wassenhove, 2004). Relief supply chain management, although arguably much different from business logistics, does also show similarities. Therefore the definitions, techniques, and approaches used within business logistics can often be transferred or altered so they fit the purpose of their context. Notwithstanding the fact that the ultimate goals and purpose of conducting the logistical activities are different, still many of the definitions relating to the field can be extracted from current definitions found in the business context. In the following paragraphs, we are providing an overview of the definitions that the book adheres to. The definitions were provided to the authors of the chapters at the outset and have been used accordingly throughout the book. Admittedly, as in the field of logistics, defining concepts is a difficult task, so authors often tend to use definitions or even define concepts in a way that fits their purpose. The chapters therefore are the sole responsibility of the authors and do reflect their views on particular issues and concepts, however, we argue that the definitions provided in the end of our preface seemingly have gained acceptance among the authors of the chapters of this book.

This anthology is designed to bring together theoretical frameworks and the latest findings from research with their discussion in particular cases. Besides a number of frameworks – of types of relationships in the relief supply chain (ch.1), relief logistics development (ch.3), value chain analysis (ch.5), civil-military co-operation (ch.9), and trust models in disaster relief (ch.10) – cases range from logistical partnerships in the Sudan (ch.2), to a comparison of relief supply chains in different earthquakes (Haiti vs. Wenchuan, ch.4), to local sourcing in Liberia (ch.7), and reconstruction in the Kosovo and the Former Yugoslav Republic of Macedonia (ch.6). This way, insights from theory and practice are combined. The anthology ends with a chapter on one of the most recent areas humanitarian logistics research and practice has embraced: questions of sustainability, and most importantly, the issue of greening the relief supply chain (ch.11).
THE COLLECTION OF CHAPTERS: A SHORT INTRODUCTION

In the foreword, Martin Christopher, Emeritus Professor from Cranfield University, discusses the importance of the topic more broadly. Professor Christopher is undeniably one of the most well-known authors and scholars in the field of logistics who has also recently embraced the field of humanitarian logistics through co-editing a book with Peter Tatham. We hope these two books will complement each other. In the preface, the editors of the book, Gyöngyi Kovács and Karen M. Spens, outline the field, provide some key definitions, and provide an overview of the chapters included.

In the first chapter by Paul D. Larson from University of Manitoba, relationship building in humanitarian supply chains is discussed. The primary purpose of the chapter, named “Strategic Partners and Strange Bedfellows: Relationship Building in the Relief Supply Chain,” is to present and discuss the author’s actor-based typology of humanitarian relationships. The framework includes relationships among NGOs, as well as between NGOs and UN agencies, military units, and business firms. Examples are used to explore unique issues in the various types of relationships. One particular NGO, Airline Ambassadors International, is offered as an example of an NGO that builds relationships with a wide variety of humanitarian actors. The chapter also examines compatibility and complementarity of organizations across the three phases of humanitarian work: preparation, response, and recovery or development. Research opportunities are discussed in the concluding comments. The chapter serves as a good introduction to following ones that further discuss some of the types of relationships outlined here.

The next chapter takes up the question of partnerships in the relief supply chain. Rolando M. Tomasinì, Hanken School of Economics, Finland, in his chapter, “Humanitarian Partnerships - Drivers, Facilitators, and Components: The Case of Non-Food Item Distribution in Sudan,” uses a case study to discuss the design of partnerships between humanitarian organizations in order to understand the drivers, facilitators and components, of a partnership. The research was designed using a topical literature review and a case study. The practical implications include discussion and guidelines for designing partnerships under high uncertainty and limited resources.

This is followed by another case study, this time of disaster preparedness and management in Thailand. At the same time, Ruth Banomyong from Thammasat University, Thailand and Apichat Sodapang from Chiangmai University, Thailand present a more general framework for relief supply chain management in the third chapter. Their “Relief Supply Chain Planning: Insights from Thailand” builds on and evaluates a general framework for humanitarian logistics. The chapter highlights the need for planning and preparedness prior to a disaster.

Further cases are presented and contrasted in chapter 4, “Humanitarian Aid Logistics: The Wenchuan and Haiti Earthquakes Compared,” by Anthony Beresford and Stephen Pettit from Cardiff University, UK. The comparison of a similar disaster in different environments helps to highlight common features in humanitarian logistics and set these apart from contextual factors such as infrastructural weaknesses. Access to a disaster area is contrasted between islands and landlocked countries. Furthermore, as in chapter one, the cases show the importance of co-ordination in the logistics response of humanitarian and military organizations.

Chapter 5, called “The Application of Value Chain Analysis for the Evaluation of Alternative Supply Chain Strategies for the Provision of Humanitarian Aid to Africa,” is a prime example of presenting a framework and discussing it on a particular case. David H. Taylor, from Sheffield, UK is an expert in value chain analysis. The study reported in this chapter was commissioned in 2009 by the charity “Advance Aid” in order to provide an independent evaluation to compare conventional methods of sup-
plying humanitarian aid products to Africa from outside the continent, with a proposed model of local manufacturing and pre-positioned stocks. The findings show that a system of locally manufactured and pre-positioned stockholding would offer significant advantages over conventional relief supply chains in terms of responsiveness, risk of disruption, and carbon footprint, and that delivered costs would be similar to or significantly better than current non-African supply options. Local manufacture would also have important benefits in terms of creating employment and economic growth, which in the long run would help African states to mitigate and/or respond to future disasters and thus become less dependent on external aid.

Local sourcing and manufacturing is also at the core of chapter 6, “Designing Post-Disaster Supply Chains: Learning from Housing Reconstruction Projects.” In this chapter, Gyöngyi Kovács, HUMLOG Institute, Hanken School of Economics, Finland, Aristides Matopoulos, University of Macedonia, Greece and Odran Hayes from the European Agency for Reconstruction, Ireland introduce a community based and beneficiary perspective to relief supply chains by evaluating the implications of local components for supply chain design in reconstruction. The chapter further discusses the challenges of post-disaster housing reconstruction projects on the cases of housing reconstruction programs in the Kosovo and the Former Yugoslav Republic of Macedonia, finding that resources and material supplies are often scarce. Several and different types of organizations are involved while projects must be completed as quickly as possible to foster recovery. The performance of reconstruction supply chains seems to depend to a large extent on the way beneficiaries are integrated in supply chain design impacting positively on the effectiveness of reconstruction supply chains.

Local sourcing is also taken up from a peacekeeping perspective. Per Skoglund and Susanne Hertz from Jönköping International Business School, Sweden, present a case study of the Swedish armed forces in Liberia and compare local sourcing in peacekeeping there with other cases in Afghanistan and the Kosovo. The chapter, “Local Sourcing in Peacekeeping: A Case Study of Swedish Military Sourcing,” not only illustrates these three cases but applies the theoretical framework of the Uppsala model of internationalisation to them. Of particular interest is the discussion of psychic distance in local sourcing.

Coming back to different types of actors and relationships in the relief supply chain, Elizabeth Barber, from the University of New South Wales, Australian Defence Force Academy, Australia discusses the role of the military in disaster relief. The chapter, “Military Involvement in Humanitarian Supply Chains,” demonstrates the multitude of activities that military logisticians can provide throughout the various stages in the humanitarian supply chains. Most military joint doctrine identifies humanitarian assistance as one of the “Military Operations Other Than War” that military personnel are trained to undertake. The supply chain management processes, physical flows, as well as associated information and financial systems form part of the military contributions to the relief supply chain. The main roles of the military to humanitarian supply chains include security and protection, distribution, and engineering. Examples of these key contributions are provided in this chapter.

Upon outlining the roles and contributions of the military, the next chapter turns to “Challenges of Civil Military Cooperation / Coordination in Humanitarian Relief.” Graham Heaslip, National University of Ireland-Maynooth, Ireland, goes through the various meanings and definitions of civil military coordination (CIMIC) and the fundamental differences between the principles and doctrines guiding the work of international military forces and humanitarian organizations. This chapter identifies the many factors that render integration and collaboration problematic between diverse assistance agencies, and especially so between civilian and military agencies. It concludes with proposals to improve CIMIC within humanitarian relief.
The challenges to develop relationships, and in particular, trust, between representatives of different humanitarian organizations is also a core theme of chapter 10, “Developing and Maintaining Trust in Hastily Formed Relief Networks.” In this chapter, Peter Tatham from Griffith University, Australia, and Gyöngyi Kovács, HUMLOG Institute, Hanken School of Economics, Finland, discuss the implications of the practical implication of a “swift trust” model in the ad hoc networks of humanitarian logisticians in the field.

In the following chapter, “A Study of Barriers to Greening the Relief Supply Chain,” the authors Joseph Sarkis, Clark University, USA, and Karen M. Spens and Gyöngyi Kovács from the HUMLOG Institute, Hanken School of Economics, Finland reveal barriers to the greening of the relief supply chain. Adoption of green SC principles in the relief SC requires a systematic study of existing barriers in order to remove these barriers and allow introduction of green practices. Expert opinions and literature from humanitarian logistics and green supply chain management are used to establish a list of barriers and to propose a categorization of barriers.

The final chapter, Ira Haavisto from the Hanken School of Economics, Finland, takes a more macro-economic view on disaster occurrence and impact in light of the logistics performance of a country. “Disaster Impact and Country Logistics Performance” discusses the links between the states of logistics infrastructure, and hence, country logistics performance, and the various impacts of disasters in terms of loss of life, number of people affected, and economic damage. Not surprisingly, high country logistics performance correlates with the economic damage of disasters, but more interestingly, high country logistics performance shows a negative correlation to the numbers of people affected. At the same time, the analysis points towards an increased need for preparedness in countries with high disaster occurrence and a low logistics performance.

In summary, the topics and chapters provided give a broad overview of the issues relevant and prevailing in the field of relief supply chain management. The actor structure in relief supply chains is, as earlier research has pointed out, complex, due to the fact that there are military, humanitarian, governmental, and for-profit actors involved in delivering relief. Partnerships, coordination, and collaboration are themes found in the chapters that relate more to strategic thinking, whereas value chain analysis and simulation provide a tool for operational types of changes to relief supply chains. The phases of disaster relief are also covered in the text, as some chapters relate more to preparedness, whereas others touch more upon the response phase of the disaster relief cycle. Some topical new issues are also discussed, such as greening the relief supply chain. In business logistics, sustainability and greening has become key, whereas green thinking, at least in academic papers found in the field of humanitarian logistics, are still scarce.

**FUTURE RESEARCH DIRECTIONS**

The book covers a broad variety of topics relating to relief supply chain management. Many of the chapters identify future directions for research. Relationship building in the relief supply chain is such an area (see ch.1). A significant body of literature has focused on coordination, or the lack thereof, in humanitarian logistics. Turning away from aspects of inter-organizational or inter-agency coordination, the focus is now shifting towards collaboration in the supply chain, i.e. considering partners such as logistics service providers (see ch.2), suppliers, and even beneficiaries (ch.6).
Another important direction is the development of comparative studies (as in ch.4) as to be able to draw on commonalities of the relief supply chain and to learn from previous disasters. The use of logistical concepts and models (ch.5) and the development of generic frameworks for humanitarian logistics (ch.3) aid in unearthing the critical success factors of logistics in disaster relief (cf. Pettit & Beresford, 2009).

The final chapter of the book indicates a further future research direction, that of considering the sustainability of aid. There are multiple meanings of sustainability in the humanitarian context. Ch.11 addresses sustainability from the perspective of greening the relief supply chain, which extends previous considerations of green logistics that were primarily concerned with transportation emissions, beyond organizational boundaries, and to other aspects of environmental impact. Also, ch.5 considers the carbon footprint of humanitarian aid. Greening aspects are of particular importance considering the debate on climate change. Ch.6 considers another aspect of sustainability, involving the community of beneficiaries in supply chain design, while ch.7 highlights the social side of sustainability in local sourcing. Further research is still needed in these areas to address questions of long-term development and sustainable exit strategies of humanitarian aid.

CONCLUSION

The field of humanitarian logistics and relief supply chain management is receiving increasing attention among academics, as well as practitioners. The number of related publications has been increasing steadily (Kovács & Spens, 2008), and a number of journals have dedicated special issues to this field. This book is, however, the first compilation of chapters dedicated to relief supply chain management. As such, it provides an overview of some of the topics covered by academics on the topic of Relief Supply Chain Management in a variety of countries around the world. However, the topics certainly do not cover all the research done in this field as we are well aware that there are a multitude of ongoing projects and research being conducted which would have been interesting to include. Our sincere hope is that this book, nevertheless, fills a gap and can be used in courses that aim to introduce academic readers to this new and emerging field. We are very grateful to all the authors who took the time to contribute and we are also indebted to the reviewers who took the time to comment on the chapters. As the editors of this book, and also, the editors of an academic journal (the Journal of Humanitarian Logistics and Supply Chain Management) that is to be launched in 2011, our hope is also that this book will inspire even more authors so that the field continues to grow and mature.

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REFERENCES


Relief supply chain management is a rather new field of research. Nonetheless, there is a steady rise in the number of relevant published articles. Whilst noting some of the most important works we would also like to refer to Peter Tatham’s Bibliography that is constantly updated and can be obtained from the first author or chapter 9.

To be noted are the following special issues in scientific journals:


Interfaces, Vol.40 No.(in press) on “Doing Good with Good OR”


and the dedicated Journal of Humanitarian Logistics and Supply Chain Management, to be launched in 2011.

FURTHER ADDITIONAL READING


Tomasini & van Wassenhove review of cases


**KEY TERMS AND DEFINITIONS**

**Disaster**: A disaster is “a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources” (UN/ISDR 2009). This definition is also used by WHO and EM-DAT. Disasters can be natural or man-made, as well as complex emergencies (combining a man-made and a natural disaster). Synonyms: emergency, calamity, catastrophe, disruption, conflict.

**Disaster Relief**: Encompasses humanitarian activities in the phases of disaster preparedness, immediate response and reconstruction. But, if not specified otherwise in a chapter, disaster relief can be seen as synonymous with activities in the immediate response phase. Synonyms: emergency relief, humanitarian aid, humanitarian assistance. Synonyms for disaster relief phases: preparation, planning, prevention / recovery, restoration, rehabilitation. The phases do not need to be seen in a sequential manner as activities from different disaster relief phases can run in parallel, and activities can also be linked to each other in a cyclical manner.

**Humanitarian Logistics**: “The process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from point of origin to point of consumption for the purpose of meeting the end beneficiary’s requirements” (Thomas and Mizushima, 2005, p.60). Synonyms as used in this book: emergency relief logistics, relief logistics, disaster relief logistics, humanitarian operations, catastrophe logistics.

**Humanitarian Organization**: An organization that manages the delivery of aid to beneficiaries, following humanitarian principles. “Humanitarian organization” is an umbrella term for non-governmental organizations and aid agencies regardless of their mandate or organizational structure. Aid can be delivered by the humanitarian organization or through (implementing) partners.
Logistics vs. Supply Chain Management: In this book we adhere to CSCMP’s definitions of logistics vs. supply chain management (CSCMP, 2006). Note that activities such as warehousing, purchasing etc. are included in the definition of logistics. We also follow the view of a supply chain extending beyond a dyad, as laid out in the author guidelines of Supply Chain Management: an International Journal (SCM:IJ, 2010).

Relief Supply Chain Management: Encompasses the planning and management of all activities related to material, information and financial flows in disaster relief. Importantly, it also includes co-ordination and collaboration with supply chain members, third party service providers, and across humanitarian organizations. Synonyms: humanitarian supply chain, humanitarian supply chain management. However, relief supply chain management does not include the development aid aspect of humanitarian logistics.