

**INTER-ORGANIZATIONAL FACTORS,
COORDINATION MECHANISM INITIATIVES,
AND PERFORMANCE: STUDY OF
HUMANITARIAN SUPPLY CHAINS**

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COORDINATION MECHANISM INITIATIVES,
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HUMANITARIAN SUPPLY CHAINS**

By

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LIST OF ABBREVIATIONS

CARE	Cooperative for Assistance and Relief Everywhere
CRED	Centre for Research on the Epidemiology of Disasters
EM-DAT	Emergency Event Database
FAO	Food and Agriculture Organization
GHA	Global Humanitarian Assistance
HAP	Humanitarian Accountability Partnership
IASC	Inter-Agency Standing Committee
ICRC	International Committee of Red Cross
IFRC	International Federation of Red Cross and Red Crescent Societies
IHO	International Humanitarian Organization
IOM	International Organization for Migration
ISDR	Inter-Agency Secretariat for Disaster Reduction
MSF	Medecins Sans Frontieres
NGOs	Non-Governmental Organizations
OHCHR	Office of the High Commissioner for Human Rights
RLU	Regional Logistic Unit
UN	United Nation
UNDP	United Nation Development Program
UNHCR	United Nations High Commissioners for Refugees
UNHRD	United Nations Humanitarian Response Department
UNICEF	United Nation Children's Fund
UNJLC	United Nation Joint Logistic Centre
UNOCHA	United Nations Office for Coordination of Humanitarian Affairs
USAID	U.S. Agency for International Development
WFP	World Food Program
WHO	World Health Organizations
WVI	World Vision International

**FAKTOR-FAKTOR ANTARA ORGANISASI, INISIATIF PENYELARASAN
MEKANISMA DAN PENCAPAIAN: KAJIAN RANTAIAN BEKALAN
KEMANUSIAAN**

ABSTRAK

Hasil daripada peningkatan dramatik yang berpunca daripada bencana alam dan manusia telah membawa kepada kerugian yang besar. Pembuat dasar, aktivis kemanusiaan, dan ahli-ahli akademik di seluruh dunia mencari cara yang berkesan dan cekap untuk mengatasi atau meminimumkan kerugian besar tersebut. Walaupun pelbagai teori asas memberi manfaat yang penting di dalam kajian rantai bekalan kemanusiaan, namun pengurusan penyelarasan mekanisma di dalam konteks ini masih belum di terokai.. Tujuan kajian ini ialah untuk mengkaji latar belakang dan hasil penyelarasan mekanisma serta untuk mengurangkan cabaran-cabarnya. Faktor-faktor antara organisasi (i.e. jumlah tanggapan saling bergantung, rantai bekalan yg dilihat dan saling melengkapi) telah dikenalpasti untuk menilai kesannya terhadap inisiatif penyelarasan mekanisme (i.e. perkongsian sumber, keseragaman, penyelarasan tidak formal, penjajaran insentif dan keselarian) adalah dianggap boleh mempengaruhi pencapaian rantai bekalan kemanusiaan. Ini dipengaruhi pula dengan peranan pelepasan ketidakpastian persekitaran sebagai pembolehubah moderator Berdasarkan teori rangkaian sosial, teori saling bergantung, dan teori kontingensi, kajian ini diperkembangkan melalui kajian literatur dan kajian awal. Sejar dengan itu, model konseptual dibina dan diuji menggunakan 101 sampel daripada pertubuhan kemanusiaan di enam negara di rantau Asia Tenggara yang

pernah menghadapi bencana besar. Analisis ini dijalankan menggunakan program perisian Analisis SmartPLS 2.0. Dapatan kajian menunjukkan bahawa rantaian bekalan yang dilihat dan saling melengkapi adalah faktor utama antara organisasi untuk penyelarasan mekanisme berkesan di sepanjang rantaian bekalan kemanusiaan. Manakala jumlah tanggapan saling bergantungan didapati tidak signifikan untuk usaha penyelarasan dalam organisasi kemanusiaan. Menariknya, perkongsian sumber dan keseragaman memberi kesan signifikan dalam pencapaian bekalan sumber kemanusiaan dari konteks sumber, keluaran, fleksibiliti dan akauntabiliti. Namun begitu, penyelarasan tidak formal, penjajaran insentif, dan keselarian adalah elemen yang signifikan di dalam penyelarasan mekanisma untuk kajian ini.. Selain daripada itu, hasil kajian juga menunjukkan bahawa peranan moderator pelepasan ketidaktentuan persekitaran melemahkan kesan perkongsian sumber dan keselarian pada pencapaian rantaian bekalan kemanusiaan. Walaubagimanapun ia menguatkan pencapaian terhadap kesan keseragaman dan penyelarasan tidak formal. Berdasarkan penemuan utama, perbincangan, sumbangan (iaitu, teori, praktikal, dan metodologi) dan batasan kajian ini, maka kesimpulan dapat dibentangkan secara terperinci.

**INTER-ORGANIZATIONAL FACTORS, COORDINATION MECHANISM
INITIATIVES AND PERFORMANCE: STUDY OF HUMANITARIAN
SUPPLY CHAINS**

ABSTRACT

As a result of the dramatic increase in natural and man-made disaster losses, humanitarian practitioners and academicians are seeking effective and efficient means of minimizing the tremendous losses. Although various theoretical underpinnings are beneficial to understand the importance of supply chain in a humanitarian context, the management of coordination mechanism along the humanitarian supply chain has yet to be explored. This study seeks to examine the antecedents and outcomes of coordination mechanism to mitigate the coordination challenges. In particular, the inter-organizational factors (i.e. total perceived interdependence, supply chain visibility, and complementarity) are identified to evaluate their impact on coordination mechanism initiatives (i.e. resource sharing, standardization, informal coordination, incentive alignment, and synchronization) that are presumed to influence humanitarian supply chain performance concerting the moderating role of relief environmental uncertainty. Drawing on social network theory, interdependence theory, and contingency theory, a conceptual model is developed and tested using 101 samples from the humanitarian organizations across six countries in Southeast Asia. The Partial Least Square (PLS) analysis was conducted using smartPLS software version 2.0. The results reveal that supply chain visibility and complementarity are the major inter-organizational factors for effective

coordination mechanism in a humanitarian context, while total perceived interdependence is found as not a significant factor for coordination of effort among the humanitarian organizations. Resource sharing and standardization affect significantly on humanitarian supply chain performance in terms of resource, output, flexibility and accountability. However, informal coordination, incentive alignment, and synchronization were determined as insignificant elements of coordination mechanism in the context of study. In addition to that, the moderating role of relief environmental uncertainty weakens the impact of resource sharing and synchronization on performance, while it strengthens the effect of standardization and informal coordination on performance. Based on the major findings, the discussions, contributions (i.e. theoretical, practical, and methodological) and limitations of the study are provided in details for the conclusion.

CHAPTER 1

INTRODUCTION

1.1 Introduction

The number of natural and man-made disasters is drastically increasing around the world. Numerous disasters have occurred within only the last few years, for instance, floods (e.g. China, India, Malaysia, and Thailand), earthquakes (e.g. Indonesia, Iran, Japan, and Turkey), volcanic eruptions (e.g. Indonesia, the Philippines, and the United States), tsunamis (e.g. Indonesia, Japan, Malaysia, and Thailand), forest fires (e.g. Malaysia, and Indonesia), and political displacements (e.g. Libya, Syria, and Sudan) (UN, 2012).

Unfortunately, two third of the world's population (i.e. 4.4 billion people) were living in a country affected by a disaster in 2012 (OCHA, 2013b). Overall, the average total number of reported disasters has more than doubled in the last two decades due to the numerous factors, such as climate change, rapid urbanization, and population increase (Tonkin, 2011). In fact, the number of disaster is estimated to increase by up to 25% by 2015 (Alexander, 2006; Majewski et al., 2010; Van Wassenhove & Pedraza Martinez, 2010). Consequently, the estimated costs caused by these events will amount to \$64 trillion over the specified period (Blecken, 2010). For the longer term, both natural and man-made disasters are predicted to increase five-fold over the next fifty years due to environmental degradation, rapid urbanization, and the spread of HIV/AIDS in the developing world (Thomas & Kopczak, 2007).

Asia was most often hit by the disasters in 2012 (Guha-Sapir et al., 2013). The evidence indicates the most vulnerable societies are located in Asia. In 2013, Asia and the Pacific received US\$558 million in humanitarian relief, which is more than twice as much as was received in 2012 (\$258 million) (OCHA, 2013a). In overall, Asia accounted for 64.5% of worldwide reported disaster victims in 2012 (Guha-Sapir et al., 2013), which shows dramatic growth in number of disasters in this continent. More specifically, according to the statistical report from the International Disaster Database (EM-DAT), in terms of total number of occurred disaster between 2000 and 2013 across Southeast Asia, countries such as Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam are amongst the top countries in this region.

Consequently, the significant growth of disaster has attracted numerous humanitarian organizations and agencies to build infrastructure in this region. For example, the International Federation of Red Cross and Red Crescent (IFRC) have set up warehouses in three critical areas: Kuala Lumpur, Dubai and Panama (Gatignon et al., 2010). In addition, the World Food Program (WFP) has established infrastructure in Malaysia to provide humanitarian assistance across disaster-prone areas in Southeast Asia (UN, 2012).

The establishment of such infrastructure signals explicitly the importance of the supply chain in humanitarian relief across Asia, specifically in the Southeast Asia. Indeed, over the last decade, humanitarian organizations have recognized the fact that supply chain management (SCM) is crucial to the performance of current and future of humanitarian relief in terms of effectiveness and efficiency (Thomas & Mizushima, 2005).

Notwithstanding the significant increasing trend in the relief sector and the importance of the supply chain in humanitarian relief, coordination of various humanitarian organizations, while interacting with other humanitarian organizations (e.g. NGOs, UN agencies, suppliers), along the supply chain can be extremely challenging (McLachlin & Larson, 2011). For instance, different actors— 16 UN agencies, 18 national Red Cross and Red Crescent Societies' response teams, more than 160 NGOs, as well as private companies and local communities – participated in the 2004 Indian tsunami, which makes the coordination between actors more problematic (Tatham & Spens, 2008).

Likewise, several other coordination problems have been practically observed from the previous disasters that have resulted to poor responsiveness of humanitarian organizations across the phases of the particular disaster (e.g. Jahre & Jensen, 2010; Sheu, 2007). Therefore, it is crucial for the humanitarian organizations to understand the importance of coordination, its antecedents which are appropriate in order to build an effective coordination mechanism along the humanitarian supply chains (Balcik et al., 2010). However, review of the literature reveals that the antecedents of coordination mechanism, the initiatives of coordination pertinent to the context of humanitarian supply chain management (HSCM) are under-examined.

Thereby, this study is aimed to fill the gap by exploring the antecedent-outcome of coordination mechanism initiatives in the context of HSCM. The remainder of this chapter is organized into eight sections. In the following section, background of the study is highlighted by addressing key issues related to recent trend of the disaster, supply chain in humanitarian relief and coordination challenges. Thereafter the problem statement is explicated following by the major research

questions and objectives of the study. The scope and significance of the study are explained in depth. Next, main contributions of the study are discussed from three angles of theory, practice, and methodology. Finally, the key terms are defined and an outline of the whole research is provided.

1.2 Background of the study

The purpose of providing background for this study is twofold. First, the recent trends of the disasters are highlighted and importance of supply chain in humanitarian relief is addressed. Second, the overall challenges, specifically coordination problems in a humanitarian context, are discussed which lead to identifying the research gap for the study and hence exploring the extent of relationship between the inter-organizational factors, coordination mechanism initiatives and performance.

1.2.1 Recent trend of the disaster

The term disaster is defined as “serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources” (ISDR, 2004, p. 3). The disaster can be categorized according to their cause (natural versus man-made) and speed of occurrence (slow versus sudden-onset) (Van Wassenhove, 2006, p.476).

A total of 357 natural disasters were reported in 2012 (see Figure 1.1), which killed over 9,655 people, 124.5 million people become victims worldwide with estimates placing the figure at US\$ 157 million (Guha-Sapir et al., 2013). The statistical data are comparable with that of results from previous year. In fact, human

and economic impacts of the disasters in 2011 were the most massive, i.e. killed a total of 30,773 people, caused 244.7 million victims, and estimated economic damages of US\$ 366.1 billion (Guha-Sapir et al., 2012). Figure 1.1 illustrates the trend of reported disaster between 1990 and 2012. Even though the trend is in a decreasing rate from 2006 to 2012, the total number of reported disaster and affected people are considered at the high level over this period, in contrast by the period between 1990 and 2000.

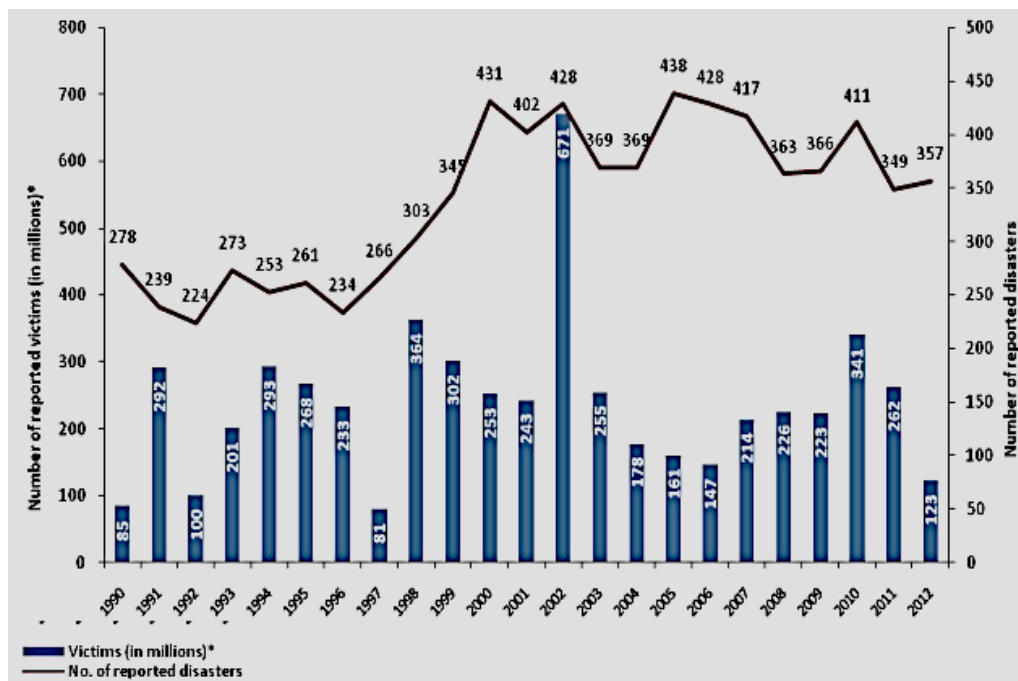


Figure 1.1 Total number of reported disasters and victims between 1990 and 2012 (Guha-Sapir et al., 2012, p. 3)

According to Emergency Disaster Database, over 80% of the recent disaster happened in Asian region with the most cost damages (Chandes & Paché, 2009). Asia is the first continent in the world which has been affected by the natural disaster since 1990 escalating tremendous damaged costs up to US\$ 40 billion (Guha-Sapir et al., 2012). Significant growth of such trends regarding the number of the disaster and

costs, the size of relief sector has grown significantly with overall international humanitarian funding at US\$ 17.1 billion in 2011 to response the need of 62 million affected people (Guha-Sapir et al., 2012). Critical environmental factors such as climate change have severe effect on occurrence of natural disaster, particularly in some wet tropical areas, in which includes Malaysia, Indonesia, Singapore, Haiti, and so forth (ISDR, 2004).

Climate change is very likely to intensifying the water cycle, reinforcing the patterns of water scarcity and abundance, therefore, increasing the risk of floods. It is estimated by 2050, annual average river runoff and water availability are projected to increase by 10-40% at high latitude and in some tropical areas (ISDR, 2004). Therefore, it is crucial to conduct the study in hot-tropical regions such as Southeast Asia. Table 1.1 is provided to further illustrate the countries in Southeast Asia with some statistical data including number of disasters, number of people killed, number of affected people, and total damages by country between 2000 and 2013.

Table 1.1

Reported disasters across Southeast Asia between 2000 and 2013

No.	Country	No. disasters	People killed	People affected	Total damages (\$)
1	Indonesia	318	186694	10993420	15658087
2	The Philippines	285	17615	78884413	4356293
3	Viet Nam	136	4783	23268498	6356707
4	Thailand	100	11314	55121236	42851130
5	Malaysia	43	493	432401	1501000
6	Myanmar	35	139705	3314576	4564158
7	Cambodia	27	1377	10105063	805100
8	Laos	15	268	2015189	134000
9	Timor-Leste	8	27	13571	0
10	Singapore	2	35	2227	0

Source: (EM-DAT, 2014)

Base on Table 1.1, six countries are ranked as the highest in terms of number of reported disasters amongst ten countries across Southeast Asian region. Indonesia is ranked as the top country that affected by 318 disasters over the last decade. Other countries, such as the Philippines, Vietnam, Thailand, Malaysia, and Myanmar have suffered from 285, 136, 100, 43, and 35 disasters respectively between 2000 and 2013. Indeed, the total damages incurred per each country were tremendous, and Thailand is on top with total value of about 43 million dollar, followed by Indonesia as the second with total cost of over 15 million dollar.

Overall, since these countries (bolded in Table 1.1) have experienced more disasters by contrast to the other countries in Southeast Asia, it is reasonable to include them as the targeted population for the purpose of the study. Therefore, the targeted population of this study includes the NGOs and UN agencies in Indonesia, the Philippines, Vietnam, Thailand, Malaysia, and Myanmar.

1.2.2 General view on humanitarian relief

This study adopts a simple core definition for the humanitarian relief from the literature as the primary goal of humanitarian action is to “protect human life where this is threatened on a wide scale” (Seybolt, 2009). Saving life of human is at the heart of the humanitarian agenda within humanitarian organizations (Seybolt, 2009). Essential humanitarian concerns are highlighted as freedom from acute suffering, basic human well-being. In addition to that, reducing the excessive level of human suffering is considered as the second goal of the humanitarians (Darcy et al., 2003).

Humanitarianism is conceived by its principles which humanitarian organizations must consider and adhere in their decision-making process. Tomasini

and Van Wassenhove (2004) define humanitarian space as the triangulation of humanity, neutrality and impartiality. Furthermore, the principles are integral part of humanitarian rules which are frequently quoted in the most mandates (Shaw, 2011). Principles need to be observed during decision making process and assess their effect during the operation (Shaw, 2011). Figure 1.2 illustrates the three main humanitarian principles.

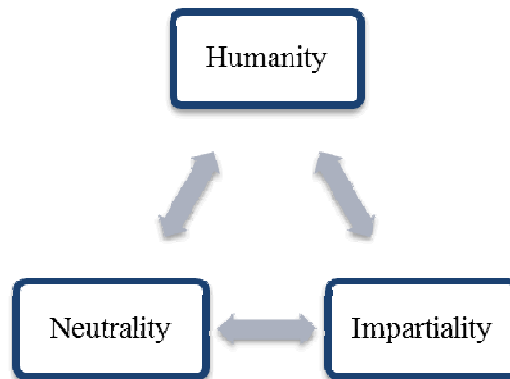


Figure 1.2 Humanitarian principles (Van Wassenhove, 2006, p. 478)

Humanity refers to the saving the human relief as priority, hence, dignity of beneficiaries have to be protected and respected. Neutrality implies that relief aid should be delivered without bias to a party in the conflict. Neutrality can be conceived as ideological non-participation, in which aid items should be supplied and distributed without affiliation to one party or other. Impartiality reflects that humanitarian assistance should be without any discrimination with priority to the most urgent needs. In particular, impartiality, according to Tomasini and Van Wassenhove (2004), can be assessed more precisely in respect of non-discrimination, non-subjective distinction of recipients, and proportionality.

1.2.3 Humanitarian relief clusters and actors

Following the suggestions of an independent Humanitarian Response Review in 2005, the cluster approach was developed as one of the elements of Humanitarian Reform Agenda to strengthening the effectiveness of humanitarian assistance (IASC, 2012). However, the foundations of the current international humanitarian coordination system were set by General Assembly resolution in 1991. Clusters are groups of humanitarian organizations, both UN and non-UN, in each of the humanitarian action, e.g. water, health, emergency telecommunication, logistics and so forth (HR, 2014).

Table 1.2

Humanitarian relief clusters

Cluster	Cluster lead
Camp coordination and camp management	IOM/UNHCR
Early recovery	UNDP
Education	UNICEF & Save the Children
Emergency telecommunication	WFP
Food security	WFP & FAO
Health	WHO
Logistics	WFP
Nutrition	UNICEF
Protection	UNHCR
Shelter	IFRC & UNHCR
Water, sanitation and hygiene	UNICEF

Source: (HR, 2014)

Overall, 11 humanitarian relief clusters exist, that each cluster relates to a specific area to cover the assistance during the phases of a disaster. Table 1.2 illustrates each cluster with their correspondent cluster lead. The cluster leads work as facilitators of their respective cluster, and act, if needed, as provider of last resort (Harland, 1996). Cluster approach has implication on the country as well as global level to build global humanitarian capacity through stock piles, pooling resources, and so forth (Harland, 1996). WFP is the leader for logistics cluster as a coordinator

to fill the gaps and alleviate bottlenecks, priorities logistics interventions and investments, coordinate port and corridor movements to reduce congestion, and provide information on equipment or relief items from the suppliers (Jahre & Jensen, 2010).

Apart from the lead clusters, approximately there are more than 100 humanitarian organizations each with budgets over \$1 million involved in disaster research, planning and relief, and there are many more with smaller budgets (Whybark, 2007). Numerous and extensive humanitarian communities has developed and established since last decade (Oloruntoba & Gray, 2006). Based on the literature review, scholars have identified that different actors are involved in providing the assistance to the beneficiaries. For example, according to Wild and Zhou (2011), humanitarian relief actors are groups or individuals including NGOs, and donors.

Thomas and Kopczak (2005) defined humanitarian actors as the “drivers”, hence, the they express that relief organizations fall into three categories of organizations operating under the UN family, international organizations (e.g. IFRC), and local and international NGOs (Thomas & Kopczak, 2005). Kovacs and Spens (2007) address the illustration of the humanitarian relief cluster including several actors (i.e. UN agencies, governments, military, NGOs, business logistic service providers, and other relief agencies).

In more holistic view, Schulz (2008) categorizes actors of humanitarian relief into broad groups of beneficiaries, donors and operational actors. Beneficiaries are the local population of the affected area. Donors are organizations from neighbouring regions or governments, or foreign government and include mostly financial and in-

kind donations. Operational actors are multilateral, intergovernmental organizations, that they give support by providing technical assistance related to the specific field of expertise. Operational actors mainly include UN agencies and NGOs, which are the main focus of this study.

1.2.4 Supply chain in disaster relief

According to Thomas (2003), the supply chain is central to the disaster relief due to several reasons. Firstly, the supply chain serves as a bridge connecting three phases of disaster (i.e. preparedness, response, and recovery) as well as procurement and distribution activities along the chain. Secondly, for the humanitarian clusters (e.g. food, shelter, health), the effectiveness and agility of response is highly critical. Finally, the supply chain manages the tracking of aid supplies through the supply chain. Therefore, it always stores and carries a rich database revealing all concerns about the supply chain from the effectiveness of supplier-suppliers to the cost and timeliness of responses (Thomas, 2003).

Supply chain activities are considered as the most expensive parts of humanitarian efforts (i.e. about 80% of total expenditures) which can be the difference between a failed or successful operation (Van Wassenhove, 2006). Accordingly, due to importance of supply chain in a disaster as well as the significant growth in the size of the relief sector, humanitarian relief should be explored from the SCM's perspective (Majewski et al., 2010). Likewise, it has been suggested that some 60-80% of the expenditure of non-governmental organizations (NGOs) is spent on the supply chain activities in humanitarian relief with an annual expenditure of over \$25 billion, which shows the significant contributions of NGOs in respect of supply chain effort in this sector (Tatham & Pettit, 2010).

The field of HSCM has become important among both academicians and practitioners, especially since the outcries about the poor supply chain management performance of the 2004 Indian Ocean tsunami (Kovács & Spens, 2011b). The mentioned disaster and other relevant criticism of managing humanitarian supply chain, is often labelled the turning point of the supply chain in humanitarian relief (Larson, 2012).

Kunz and Reiner (2012) analysed a set of 174 papers published in peer-reviewed journals from the previous literature on humanitarian logistics and supply chain between 1993 and 2011. They finalized the trend in the number of publications per year that has dramatically increased since 2006 and reached to the over 40 papers published in 2011. This strong increase relies on the fact that between 2004 and 2006, three major disasters occurred. This increase can also be explained by the fact that several journals published special issues focusing on humanitarian supply chain.

Since then, natural disasters, such as the Pakistan and Bangkok floods, the 2010 Haiti earthquake, and the 2011 Japan tsunami have continued to trigger remarkable interest in this field (Kovács & Spens, 2011a). However, the literature reveals that due to the primary objective of the humanitarian supply chain (i.e. helping the beneficiaries effectively and efficiently), and the growth in the number of disasters, more research on HSCM is required (Kovács & Spens, 2011b).

Notwithstanding, for most disasters that occur, several actors (e.g. government agencies, NGOs, suppliers, and UN agencies) are willing to participate (Kovács & Spens, 2007). Therefore, several challenges, more specifically coordination challenges, may hinder the efficient delivery of aid supply from the suppliers and/or

donors to the beneficiaries (i.e. aid recipients of humanitarian organizations) by the humanitarian organizations. The next section discloses the coordination challenges as one of the recent critical concern in the context of HSCM.

1.2.5 Coordination challenges along the humanitarian supply chains

Challenges regarding coordination in the field of HSCM have yet remained debatable (Jahre & Jensen, 2010). For example, the failure of the logistics cluster approach between participating NGOs and UN agencies is blamed on poor coordination (Stoddard et al., 2007). Notwithstanding, evolution of coordination mechanism has been accepted in long run for the management of coordination in inter-organizational literature (Lazzarini et al., 2001; Stank et al., 1999), leading to enhanced performance (Arshinder et al., 2008).

Moreover, the coordination is considered as vital by the head of the United Nations Office of the Coordination for Humanitarian Affairs (UNOCHA) (Guha-Sapir et al., 2010). Indeed, coordination have been repeatedly emphasized as the major challenges among humanitarian organizations themselves (e.g. one NGO and another NGO), between humanitarian organizations and suppliers/donors, and between humanitarian organizations and private firms during the preparedness and response phases of a disaster (e.g. Balci et al., 2010; Jahre & Jensen, 2010).

In the similar sense, Stephensen Jr and Schnitzer (2006) posit that coordination among supply chain actors (e.g. NGOs, UN agencies, local communities, and local government) is problematic in the last mile distribution, as several actors intend to participate to deliver the final aid supply to the beneficiaries, while each actor operates under different constraints and conditions. Thereby, due to the congested

existence of numerous actors and scarcity of resources provided by donors, intense competition is estimated to occur during the emergency response phase of disasters (Bennett et al., 2006). As a result, poor responsiveness is reported between suppliers, UN agencies, NGOs, which mostly stems from the lack of poor coordination of humanitarian organizations along their supply chains (Ertem & Buyurgan, 2011).

The critical coordination challenges mentioned earlier and understanding the potential benefit of coordination mechanism have motivated the researcher to fill this gap by conducting an antecedent-outcome study of coordination mechanism. Probably, determining some initiatives can help humanitarian organizations to have a better coordination with the other involved organizations during a disaster. The following section discusses in detail the problem statement of the study.

1.3 Problem statement

The review of the literature indicates extensive research relating to commercial supply chain, but little on humanitarian logistics (Oloruntoba & Gray, 2002), and on humanitarian supply chain (Larson, 2012). In the business world, coordination has been broadly identified as being essential for successful SCM (Fugate et al., 2006), as a potential source of competitive advantage (Huiskonen & Pirttilä, 2002), and as a strategic design of decision between actors to enhance performance in respect of customer service and response time (Lee, 2000). However, the coordination of efforts has been challenged in a humanitarian context.

Notwithstanding the numerous benefits of coordination in the context of HSCM, the literature reveals numerous practical coordination problems. For example, the case of the Indian Ocean tsunami in 2004 and the Darfur crisis in 2004-

2005 were obvious examples of poor coordination among the humanitarian organizations (Jahre & Jensen, 2010). During the earthquake response in China, although three refugee centres were established as distribution centres in different locations, a lack of coordination was reported between the refugee centres and relief supply sources (Sheu, 2007). Likewise, coordination in logistics cluster was focused in the case of Sudan by the United Nations Joint Logistics Centre (UNJLC) (Jahre & Jensen, 2010). However, coordination meetings among participants failed to achieve a successful coordination using the cluster approach (Stoddard et al., 2007).

Previous studies show that numerous humanitarian organizations have failed to obtain their coordination goals (Akhtar et al., 2012). Inefficiency in activities can also be due to a lack of coordination which results in poor responsiveness and a delay in the procurement of the items needed for a particular disaster (Ertem & Buyurgan, 2011). Overall, the practical challenges and lack of research regarding the coordination mechanism in the context of HSCM leads humanitarian organizations to implementing poor coordination mechanism and hence obtaining poor performance (Chandes & Paché, 2009; Mbohwa, 2006; Schulz & Heigh, 2009).

Although coordination mechanism has been widely introduced and discussed in the domain of the supply chain for the purpose of long-term relationships, coordination in the humanitarian supply chain is still in its infancy (Balcik et al., 2010). The reason is that coordination in the humanitarian supply chain occur in a very short-time frame, hence, organizations have difficulty in managing the coordination mechanism during the phases of a disaster. Moreover, coordination mechanism among the involved actors, some of whom have competing missions, remains a critical challenge and is under-examined (Saab et al., 2012).

More specifically, poor coordination, which was caused by the lack of information sharing affected the performance during the response to the Asian tsunami (Telford & Cosgrave, 2006). Apart from resource sharing, standardization, as an initiative of the coordination mechanism, is clearly not identified by the focal humanitarian organization (Gustavsson, 2003). As a result, it is highly important to study the coordination mechanism initiatives (e.g. resource sharing, and standardization) that are pertinent to the domain of HSCM. To support this statement, Balcik et al. (2010) argue that the literature lacks studies that broadly and systematically address coordination mechanism along the humanitarian supply chain.

With regard to the inter-organizational factors, research in the business setting proves that when organizations face complicated challenges within the supply chain, they are often dependent on an episodic (i.e. short time frame) coordination as a means to combine internal and external skills and resources for successful resolution. In such situations, they are likely to engage intensely with another firm (Zacharia et al., 2011). Interdependence has only been discussed within a very limited extent in the SCM research, and, in most studies, in an intra-organizational literature (Dubois et al., 2004). Therefore, the empirical research is required to explore the extent of relationship between interdependence and coordination mechanism initiatives in the context of HSCM.

Apart from perceived interdependence, the other major inter-organizational factors, i.e. complementarity and supply chain visibility, were addressed in both the business literature (e.g. Grandori & Soda, 1995) and HSCM literature (e.g. Larson, 2012). However, the relationship between these two antecedents and the coordination mechanism initiatives is neither discussed nor tested in a humanitarian context.

Therefore, this study is interested also in determining the impact of complementarity and supply chain visibility on coordination mechanism initiatives along the humanitarian supply chain.

Furthermore, the importance of coordination is addressed in the HSCM research as it helps to increase the efficiency of the overall operation (Balcik et al., 2010; Schulz & Blecken, 2010). There is evidence that coordination mechanism increases the level of efficiency of the overall disaster operation, while lack of it may lead to a waste of resources and valuable response time (Schulz & Blecken, 2010; UNHCR, 2003). Likewise, Pettit and Beresford (2009) argue that coordination is a critical success factor of strategic planning in order to enhance the delivery performance. Overall, an appropriate coordination mechanism can improve relief performance, and it is logical to determine the impact of initiatives of coordination mechanism on performance in the context of study.

In addition to that, literature review indicates that the characteristics of the relief environment present a challenge influencing the strength of relationship between coordination mechanism initiatives and performance. Numerous factors in the literature were highlighted as characteristics of the relief environment, such as diversity of actors (e.g. Balcik et al., 2010; Jahre et al., 2009; Kovács & Spens, 2007), asymmetry information among the humanitarian organizations (Norrman & Jansson, 2004), lack of clear command and control (McLachlin & Larson, 201), extreme unpredictability of demand, destabilized local infrastructure, and fragmented information (e.g. Kelly, 1995; Kovács & Spens, 2007, Van Wassenhove, 2006). These factors can either weaken or strengthen the relationship between initiative of coordination mechanism and performance in the context of HSCM. However, the

moderating role of the characteristics of the relief environment on the relationship between the coordination mechanism initiatives and performance is under-examined. Hence, this study is also interested to examine the moderating role of characteristics of relief environment on the relationship between coordination mechanism initiatives and performance.

Moreover, most previous studies related to the HSCM research have focused on the preparation phase for disaster relief. Therefore, scholars argue that further research is necessary to extend the building blocks of coordination mechanism initiatives to the all phases of a disaster, such as the emergency response and recovery (Oloruntoba, 2010). Consequently, the study provides insights as it determines the coordination mechanism initiatives encompassing three phases of a disaster. Additionally, most disasters have occurred in Asia, more specifically in Southeast Asia, while there is a lack of research in this region (Whybark, 2007). Therefore, more academic research is required to examine the practical solutions to overcome the coordination challenges in a humanitarian context in the emerging countries (Beamon & Balcik, 2008).

Based on the identified gap in the literature, the study is aimed to determine the extent of relationships between set of inter-organizational factors (i.e. perceived interdependence, supply chain visibility, and complementarity) and coordination mechanism initiatives (i.e. resource sharing, standardization, informal coordination, incentive alignment, and synchronization). Additionally, the study is also interested to examine the impact of coordination mechanism initiatives on humanitarian supply chain performance in terms of flexibility, resource, output and accountability.

Furthermore, the research is also aimed to determine the moderating role of characteristics of relief environment, which is assumed to changing the strength of the relationship between each of coordination mechanism initiative and humanitarian supply chain performance. This assumption is consistent with the seminal work of Venkatraman (1989), who notes that the environmental effect can either hinder or boost the relationship between structure (i.e. coordination mechanism) and outcome. Following the overarching research aim of the study that mentioned above, the major research questions of the study are addressed as below.

1.4 Research questions

The host of problems discussed in the earlier sections has raised some important queries worthy of closer examination. The major questions of the research are, therefore, as below:

1. What is the relationship between the inter-organizational factors and the coordination mechanism initiatives during the overall phases of a disaster?
2. What is the relationship between the coordination mechanism initiatives and humanitarian supply chain performance during the overall phases of a disaster?
3. What is the moderating role of characteristics of relief environment on the relationship between the coordination mechanism initiatives and humanitarian supply chain performance during the overall phases of a disaster?

1.5 Research objectives

Based on the list of research questions derived, the current study intends to achieve the following objectives:

1. To determine the extent of the relationship between the inter-organizational factors and the coordination mechanism initiatives during the overall phases of a disaster.

2. To determine the extent of the relationship between the coordination mechanism initiatives and humanitarian supply chain performance during the overall phases of a disaster.

3. To determine the moderating role of characteristics of relief environment on the relationship between the coordination mechanism initiatives and humanitarian supply chain performance during the overall phases of a disaster.

1.6 Scope of the study

Based on the research objectives, the study needs to be conducted in the relief industry in order to determine and test the extent of relationship between antecedents (i.e. perceived interdependence, supply chain visibility, and complementarity), coordination mechanism initiatives (i.e. resource sharing, standardization, informal coordination, incentive alignment, and synchronization), and humanitarian supply chain performance. According to the related literature, the main actors across network of humanitarian supply chain are various, including governmental agencies, inter-governmental organizations (e.g. UN agencies), military, commercial local and international suppliers, and NGOs (Kovács & Spens, 2007). However, the literature and empirical evidence reveals the key role of the UN agencies and NGOs as the major contributors in terms of coordination along the humanitarian supply chain during a disaster (Taylor et al., 2012).

Moreover, humanitarian organizations are largely represented by the UN and the regional Red Cross and Red Crescent Societies (Tomasini & Van Wassenhove, 2009). In fact, major humanitarian organizations fall into three categories – organizations under the UN agencies, international organizations (e.g. Red Cross Societies) and NGOs (Thomas & Kopczak, 2005). In addition to that, the NGOs and UN agencies act as intermediaries within the humanitarian supply chain bounding

from the suppliers and/or donors to the local communities and finally to the beneficiaries (Beamon & Balcik, 2008; Schulz, 2008). Therefore, the NGOs and UN agencies play a key role connecting the upstream humanitarian supply chain (i.e. suppliers and/or donors) to downstream humanitarian supply chain (i.e. beneficiaries) (see Figure 1.3).

In a similar sense, Tatham and Pettit (2010) refer to the humanitarian supply chain as a network of organizations with the biggest contributors being the NGOs and UN agencies. In addition to that, only a dozen NGOs, deliver over 90% of the funds mobilized by the humanitarian community (Klaus, 2004). Therefore, this study is focused on NGOs and UN agencies as the main coordination contributors in the midstream of humanitarian supply chain, and thus as the scope of this study (see Figure 1.3). It is important to note that NGOs in this study includes national and international NGOs (INGOs), IFRC, International Committee of the Red Cross (ICRC) and Red Cross and Red Crescent Societies (RCRC).

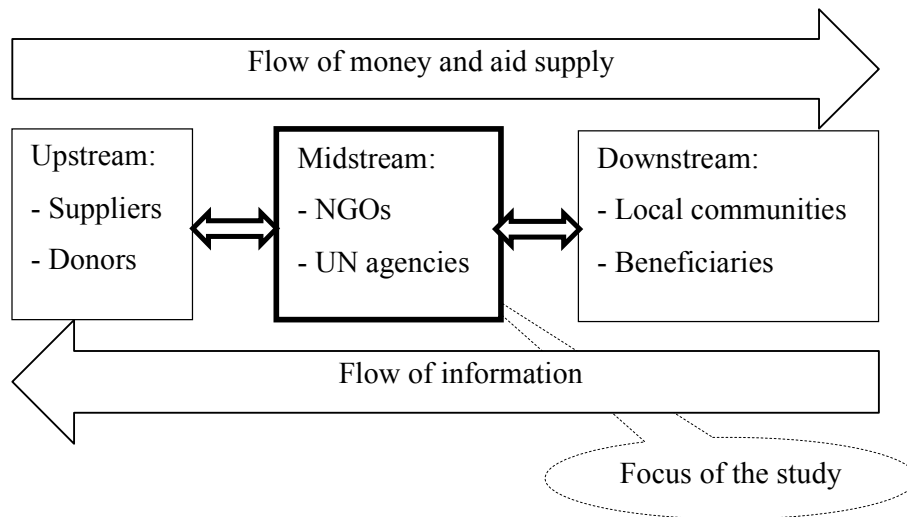


Figure 1.3 Illustration of humanitarian supply chain structure

More specifically, due to criticality of a disaster at both national and international level, the study selected the targeted populations for the study incorporating humanitarian organizations that involve in humanitarian relief at both national and international level. Therefore, the respondents for this study include major actors who participate in humanitarian relief nationally and/or internationally. As mentioned earlier in this section, humanitarian organizations and communities such as INGOs, UN agencies and IFRC are at the heart of humanitarian network at the international level, while national NGOs, are at the heart of humanitarian network at the national level. Therefore, these humanitarian organizations in relief sector are considered as the main respondents for the purpose of the study (they are bolded in Figure 1.4).

Regarding the phases of a disaster, the study provides insights into the literature by encompassing the overall phases of a disaster (i.e. preparedness, response, and recovery) (see Figure 1.5). This is consistent with the statement that notes the criticality of all the phases of a disaster (Kovács, & Spens, 2007).

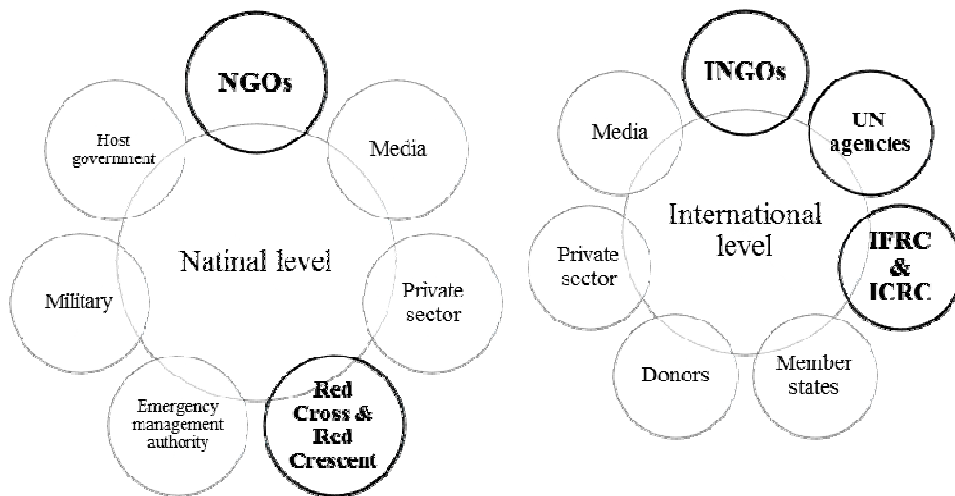


Figure 1.4 Basic structure of the humanitarian network (UNOCHA, 2014)

Although preparedness and response phases of a disaster are more important as coordination is the main concern in these phases (Jahre & Jensen, 2010), the study includes overall phases of a disaster to cover a broader view underlying the antecedent-outcome study of coordination mechanism in a humanitarian context.

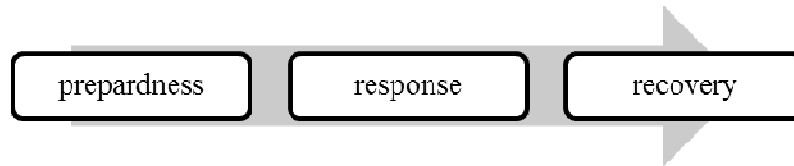


Figure 1.5 Phases of a disaster

The present study is quantitative in nature incorporating structural equation modelling (SEM) approach. Upon review of the literature, the interview study was conducted to confirm the developed conceptual model of the study. A structured questionnaire, comprising the major variables of the study (i.e. inter-organizational factors, coordination mechanism initiatives, humanitarian supply chain performance, and characteristics of relief environment), were distributed among the targeted populations including NGOs and UN agencies that are active and involve in disaster relief across Southeast Asian countries (i.e. Indonesia, Malaysia, Myanmar, the Philippines, Thailand, and Vietnam). Thereafter, the data set in this study is assessed and tested using partial least square (PLS) analysis as a variance-based method.

In overall, the current study undertakes a study of the antecedents and outcomes, which is similar to the cause and effect method. In another words, given a certain situation (antecedent), what is likely to follow (outcome). The antecedents of this study are titled as inter-organizations factors including perceived interdependence, supply chain visibility, and complementarity. The coordination mechanism initiatives are influenced by the antecedents, and consequently

coordination mechanism has impact on performance in a humanitarian context. The operationalized model for this study is depicted in Chapter 2. The subsequent section reveals the significance of the current study.

1.7 Significance of the study

Based on the overarching research aim and research questions of the study, the significance of this study is manifold. Firstly, the selected research focus of this study is expected to be significant as it is related to the life of human beings and society as a whole. Since, the study is aimed to determine the impact of antecedent on coordination mechanism initiatives, the results of the study benefit humanitarian community to have better understanding about the coordination mechanism during the humanitarian assistance in a disaster.

Consequently, a better understanding and appropriate application of coordination mechanism by the focal humanitarian organization can improve humanitarian supply chain performance in terms of serving the vulnerable societies and affected communities (i.e. beneficiaries) effectively. Additionally, availability of limited resources during disaster relief makes humanitarian organizations to develop a strategic coordination plan efficiently while delivering the aid supply to the beneficiaries. Therefore, the outcome of this study can provide insights in terms of economic benefit by examining the extent of relationship between coordination mechanism initiative and operational performance. Therefore, the outcome of this study will be of benefit to the society and the economy as well.

Secondly, the recognition of antecedents as essential prerequisites will facilitate coordination between the focal organization and the other involved actors within the