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“Supply Chain Designs for Humanitarian Relief”

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Author: Ziyad Awan
& Ziaur Rahman

Tutor: Johan Larsson
Helgi- Valur Fridrikson

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Title: Supply Chain Designs for Humanitarian Relief
Authors: Ziyad Awan(xeyyad@gmail.com) & Ziaur Rahman
Tutor: Johan Larson & Helgi- Valur Fridrikson
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Abstract

Problem. Due to the unpredictable nature of sudden onset disasters the humans are often caught with surprise so are the humanitarian relief organizations. In order to quickly react to the emergencies, supply chain networks are built instantly by the actors of the relief management. Parallel to this process, need assessment is started with the help of local experts which also confirm that the response cannot be lingered on due a delay in need assessment. After wards the supply chain structure needs to be changed once the right information is gathered by the passage of time. This is not all, actually the situation of the disaster prone area and people also changes by that time which always brings a challenging scenario for humanitarian relief actors to develop the supply chain design with flexibility.

Purpose. Primary focus of this paper is to define right supply chain designs for *disaster response* and *post disaster* phases in humanitarian relief.

Method. This research employs qualitative research method and a comprehensive questionnaire is also used to get the appropriate and clear response from practitioners in the field of humanitarian logistics.

Findings and recommendations. This research concludes with a series of appealing findings to aid in developing better supply chain fit, smooth transition with in supply chain structures, defining niches of humanitarian organizations and supply chain integration among all the actors involved in the relief process.

Dedication

We want to dedicate this research to all the human beings who has been the victims of disasters for centuries.

Albert Einstein said “strange is our situation here on earth. Each of us comes for a short visit, not knowing why, yet sometimes seeming to divine a purpose. From the standpoint of daily life, however, there is one thing we do know: that man is here for the sake of other men”

We also look forward to a day when the humans will start believing in coherent and tightly knitted societies and will discourage the inequality. It will be a moment when we will not be separating people on their religions, wealth, sects, gender and ethnicity.

Gandhi appropriately said that “science without humanity, worship without sacrifice, knowledge with out character, commerce without morality, and politics without principles leads to many problems for man kind.

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Ziyad Bashir Awan & Ziaur Rahman

Jönköping International School of Business

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1 Introduction

This chapter starts with a background on Disaster response management followed by the problem discussion, little about two major phases of disaster, the purpose of this thesis and finally the research questions.

1.1 Background

Thomas & R, Kopczak (2005) state that the importance of humanitarian logistics is beginning to register as a European Ambassador at a post Asian Tsunami donor conference said, “We don’t need a donors conference, we need a logistics conference.” Medicens Sans Frontiers agreed with the sentiment “what is actually needed; are the supply managers with out borders: People to sort goods, identify priorities, track deliveries and direct the traffic of relief effort in full gear.

Disaster response management has two major phases and it is of prime importance that these two can be recognized separately from humanitarian logistics and supply chain perspective. First phase in humanitarian relief management is the initial days of “sudden on set disaster” and second phase is the later phase named as “post disaster”. We differentiated these two phases in detail for the first time to emphasis the need for two different supply chain structures to achieve a strategic fit respectively.

"Disaster" is an instance which results in danger to human lives, properties and health. Disaster management is often described as a process with several stages (Long, 1997; Nisha de Silva, 2001). Lee & Zbinden, (2003) discuss three phases of disaster relief operations, the phases of preparedness, during operations, and post-operations. The speed of humanitarian aid after a disaster depends “on the ability of logisticians to procure, transport and receive supplies at the site of a humanitarian relief effort” (Thomas, 2003). Two main streams of humanitarian logistics can be distinguished as continuous aid work and disaster relief (Long, 1997).

When the disaster strikes the very first action needed is to recover dead bodies, rescue live people from debris or flood and immediately move them to shelters with proper first aid where and where needed. Barbarosog̃lu et al. (2002) describe relief as design the transportation of first aid material, food, equipment, and rescue personnel from supply points to a large number of destination nodes geographically scattered over the disaster region and the evacuation and transfer of people affected by the disaster to the health care centers safely and very rapidly.

1.2 Problem Discussion

In last few decades comprehensive researches in commercial supply chains and logistics has brought a lot of improvements and new thinking; where as humanitarian logistics is far

behind in research and on even borrowing the existing ideas and models which exist in commercial supply chains. As disasters may strike in different forms and locations and mostly shock the humans due to its unpredictability. Afterwards humanitarian relief organizations and other actors immediately design supply chains according to the geographical location and scale of the disaster. Due to the dual cyclic nature of “on set natural disasters” the transitions of supply chain designs from *disaster response* phase to *post disaster* phase needs to be smooth to avoid the potential delays in re settlement and relocation of the humans in that area. If the emergency phase is too much highlighted then many of the distant donors will start focusing on emergency phase of it while donating goods which may lead to the imbalance of logistics, equipments, epidemic medicine, camps, mobile clinics and road networks due to the variant and uncertain lead time from countries also the congestion in air & sea traffic.

Once the disaster strikes, it is of key importance to quickly asses the point where the second phase will potentially start. In case of earth quake; people under debris will have minor possibility of surviving after certain days and rescue efforts should be replaced with re habilitation. At operation level this transition means the requirement of replacing the Helicopters, Ambulances, search teams, paratroopers by trucks, reconstruction equipment, tents, schools, medical teams and road builders etc.

1.3 Purpose

Primary focus of this paper is to define a right supply chain for “*disaster response*” and “*post disaster*” phases of humanitarian relief management.

1.4 Research Questions

What are the major dissimilarities in humanitarian relief supply chain designs for two phases “Disaster response ” and “Post disaster”?

2 Frame of References

This chapter consists of the description of disasters, humanitarian relief, humanitarian supply chain, disasters assistance phases and supply chain structures.

2.1 Disaster:

Disaster is an instance which results in danger to human lives, properties and health. Please note that in this paper, the words “*Disaster*” and “*emergency*” are used interchangeably. According to Edward (2005) the event becomes a disaster when the community's capacity to cope is overwhelmed and the status quo becomes untenable. The situation is then declared an emergency and assistance is requested. Disasters happen when hazards meet exposure due to vulnerability.

	Natural	Man-Made
Sudden-Onset	Earthquake Hurricane Tornadoes	Terrorist Attack Coup d Etat Chemical Leak
Slow-onset	Famine Drought Poverty	Political Crisis Refugee Crisis

Figure 2-1: types of disaster (LN Van Wassenbove, 2006)

2.2 Phases of Disaster Management.

Patrick safran (2003) explained the different phases of disaster management, starting from the impact of disaster, state of emergency, recovery, development, prevention, preparation and early warning. This model emphasis on the need for strategic thinking and depict the transition points from first phase to the later phases. Our research also focuses the transition from one supply structure to another to meet the strategic and tactical objectives of the relief. It is vital to understand phases that we have consolidated the phases into two major phases for the ease of supply chain control and improved execution.

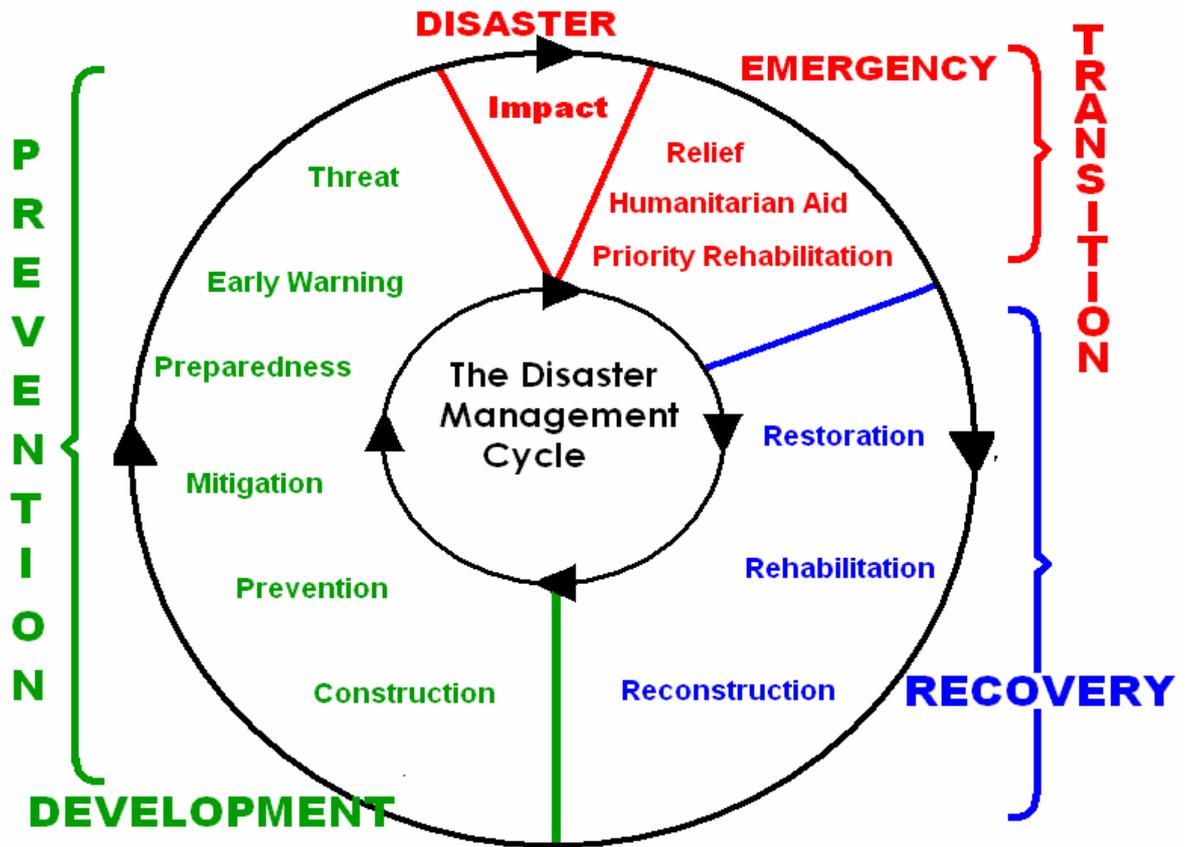


Figure 2-2: Strategic approach for disaster and emergency assistance (Patrick Safran, 2003)

The term "*post disaster*" can be described as a situation which may last from couple of days to decades. Once the chaotic situation after disaster is over, the primary objective of relief organizations is to *rehabilitate affected people, distribute food, assistance in reconstruction* of devastated area to improve infrastructure. The need from logisticians in this phase is to *increase efficiency* until people are brought back to normal lives. According to (Patrick Safran 2003) as time passes the resources become scarce thus the relief organizations have to survive within these allocated resources. Gustavsson (2003) explains that it is unfortunate that for many disaster-struck areas, funding is often focused on short-term disaster relief. According to Marcia Perry (2007) the long-term phase of reconstruction is often neglected. On the other hand, aid agencies, such as World Vision whose mandate is to respond in some way to any disaster around the world, has created a phased relief response which typically occurs in three phases: seven-day, 30-day, and 90-day. However (Murray, 2005) narrates that as donors insist that their money goes directly to help victims and not to back-office operations, preparation and training are often neglected. Further more (M, Perry 2007) explains that there was also a lack of widely articulated follow-up plans to meet the requirement of developing resilient, safer communities and long-term livelihoods for the affected communities. The aid agencies were also under pressure by the donor public to spend quickly, indicating the need for greater education of the wide donor group of longer-term funding requirements.

2.3 Life Cycle of Disaster Response.

Tomasini & V, Wassenhove (2006) explains the life span of disaster and divided the response in three phases as shown in the following figure 2.3. Further explains that ramp up is the phase when the humanitarian relief starts by deploying the teams in the target area. Word ramp up refers to the “*disaster response*” often starts gradually up to the right momentum due to its dependence on need assessment which is done parallel to this. Next phase of sustainment illustrates that once the services are operated at full scale then there is a need to sustain that until a certain time. Last phase of ramp down shows that when the need for assistance diminishes then the deployment of assets and teams is ramped down gradually.

These two phases *sustainment* and *ramp down* can also be set apart from the first phase of ramp up and we have named it as “*post disaster*”

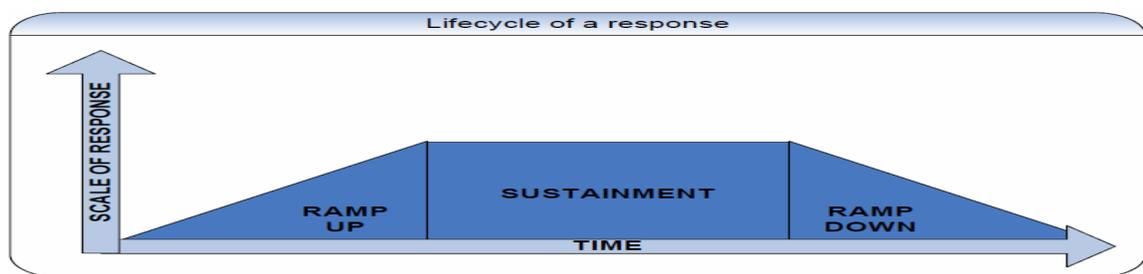


Figure 2-3: Life cycle of response (Tomasini & V, Wassenhove, 2006)

2.4 Humanitarian Relief:

According to *UNDP* signed resolution in 2003, Humanitarian relief aims are described in three steps

1. It aims to *save lives*, *alleviate suffering* and *maintain human dignity* during and in the aftermath of man-made crises and natural disasters, as well as to *prevent* and *strengthen preparedness* for the occurrence of such situations.
2. Humanitarian action should be guided by the *humanitarian principles of humanity*, meaning the centrality of saving human lives and *alleviating suffering* wherever it is found; *impartiality*, meaning the implementation of actions solely on the basis of *need*, without *discrimination* between or within affected populations; *neutrality*, meaning that humanitarian action must not favor any side in an armed conflict or other dispute where such action is carried out; and independence, meaning the autonomy of humanitarian objectives from the political, economic, military or other objectives that any actor may hold with regard to areas where humanitarian action is being implemented.
3. Humanitarian action includes the protection of civilians and those no longer taking part in hostilities, and the provision of food, water and sanitation, shelter, health services and other items of assistance, undertaken for the benefit of affected people and to facilitate the return to normal lives and livelihoods.

2.5 Humanitarian Relief and Supply Chain Management:

Smith & Dowell (2000) called the humanitarian relief supply chain networks in rapid onset disasters as “*incident organizations*”. Fitzgerald (2004) named the same as “*collaborative entities*”. Furthermore, since most natural disasters are *unpredictable*, the demand for goods in these disasters is also unpredictable (Cassidy, 2003; Murray, 2005).

2.6 Humanitarian Supply Chain.

There is no clear humanitarian supply chain design, but the most typical design described by (Richard. O, & Richard G, 2006) is as follows



Figure 2-4: A typical Humanitarian Supply Chain (Richard. O, & Richard G, 2006)

Humanitarian supply chain are mostly *unstable*, sometimes the supply chain breaks at the *receiving end*. Humanitarian logistics again is characterized by large-scale activities, irregular demand and unusual constraints in large-scale emergencies (Beamon& Kotleba, 2006). The supply network structure of humanitarian logistics also differs from that of business logistics due to the fact that it is comprised of so many actors with no clear or stated linkages to each other (G Kova'cs & K M. Spens 2007). Haghani and Oh (1996) describe the relief chain as a *multi-commodity* and *multi-modal* network flow problem with time windows. This is one of the most complex network flow problems in operations research. The management of this difficult supply chain directly affects program quality.

2.6.1 Humanitarian Logistics:

Humanitarian logistics is defined as “the process of *planning, implementing & controlling* the *efficient, cost-effective* flow of goods and materials as well as related information, from *point of origin* to *point of consumption* for the purpose of meeting the ultimate requirements of the *end beneficiary* (Thomas & Mizushima, 2005).

Byman et al. (2000) writes that *humanitarian aid organizations & NGOs* engage in two broad types of activities:

(1) *Relief activities*: relief for victims of large-scale emergencies. These short-term activities focus on providing goods and services to minimize immediate risks to human health and survival.

(2) *Development activities*: longer-term aid, focusing on community self-sufficiency and sustainability. These activities include establishing permanent and reliable transportation, healthcare, housing, and food. It is indeed humanitarian logistics that contributes most to disaster relief; all estimates putting the cost of disaster relief of at least 80% to consist of logistics efforts (Van Wassenhove, 2006). Thomas (2004) notes that humanitarian logistics "serves as a bridge between the *disaster preparedness* and *response*, between *procurement* and *distribution*, and between *headquarters* and the *field*."

Russell (2005) describes that locations are frequently unknown until the demand occurs. Short lead times dramatically affect inventory availability, procurement, and distribution. Transportation and supply information is *unreliable, incomplete, or non-existent*. Due to the high stakes nature of disasters and complex emergencies, the desire to rush aid to victims and the lack of coordination of NGOs, many relief operations are *ad hoc* and *poorly structured*.

2.7 Participants in Humanitarian Relief.

About the role of the humanitarian logisticians, (Thomas 2003) states that annual turnover of logisticians is 80% due to the high pressure environment; organizations seek experienced people in this area where experience counts more than the knowledge. Tomasini & V, Wassenhove (2006) narrates that the post event knowledge is wasted due to high turnover of logisticians.

According to Campbell and Hartnett, (2005), in an emergency situation coordinating the efforts and activities of different national and international organizations requires strong leadership. However, in practice, the various organizations normally tend to work independently (Sommers, 2000). Maxwell and Watkins (2003) indicated that the emergency preparedness and response stages are driven by information. During a crisis, humanitarian agencies require information relating to the disaster situation, the affected population and the availability of resources (Zhang et al., 2002). The participating agencies will have their own operating methods and sometimes there is competition amongst them for the limited resources (Long and Wood, 1995). The response to a major disaster generally requires the involvement of different national and international agencies (McEntire, 2002). Information plays a crucial role in disaster management. It is clear that the speed with which the critical information is *collected, analyzed* and *distributed* by participating agencies will facilitate an effective response and hence more lives can be saved. However, collecting information may be very difficult because of inaccessibility to the affected areas due to the destruction of infrastructure and in some cases the remoteness of disaster-affected areas (King, 2005). Usually needs assessment is conducted by humanitarian agencies to guide their decisions in a given disaster situation (Darcy & Hofmann, 2003). Effective collaboration between natural disaster response parties including the local population, local government authorities and humanitarian organizations is an essential part of natural disaster management (Oloruntoba, 2005; McEntire, 2002). Simatupang et al. (2002) indicated that collaboration amongst independent organizations is essential to improve their processes in

response to the rapidly changing conditions. However, effective collaboration in humanitarian emergencies is difficult to achieve. The involvement of a vast number of agencies can create obstacles in the coordination efforts at the field level (Pan American Health Organization, 2001).

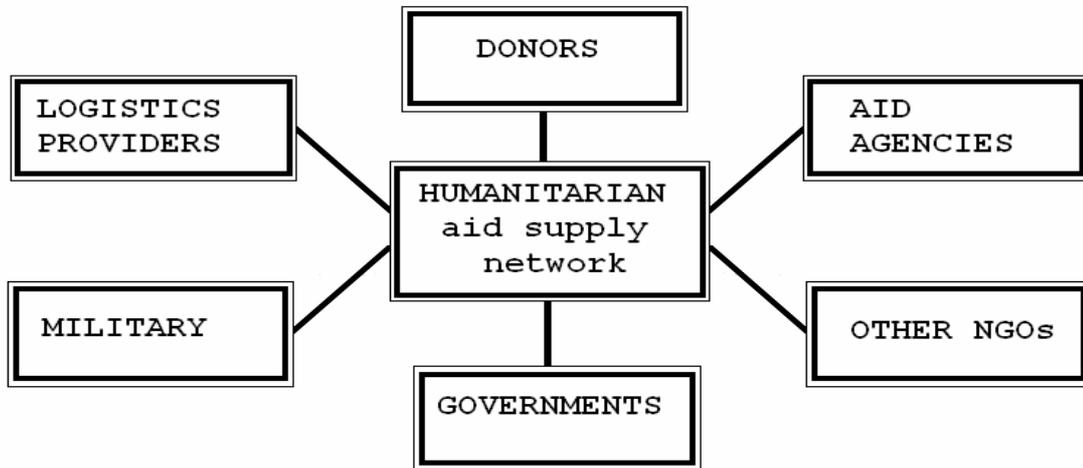


Figure 2-5: Actors in Humanitarian relief management (Gyongyi K & K.M. Spens, 2007)

The above figure 2-4 explains the actors involved in the humanitarian relief operations; however it neglects the role of *local people*, who have been supporting each other for many centuries.

2.8 Transportation

Russell (2005) explains that transportation makes it possible for assistance to reach those in need. Transportation in a disaster or humanitarian emergency can run the gamut. It can involve *global sourcing, drop shipment, military transport, commercial transport, non-commercial transport, third-party 40 logistics firms, freight forwarders, charter aircraft*, or even *local transportation* such as mules and donkeys. Goods are often brought into a country at an entry point and then moved to collection sites run by relief organizations. Özdamar et al. (2004) explains that in emergencies vehicles are called from every node in a network, independent of the actual demand in the node. Greiling Keane (2005) commented to the same fact that it can lead to trucks circulating around a disaster area without any particular destination

2.9 Dual Cycle Model of Humanitarian Supply chain:

Our theoretical model is about two phases and is not the same as the model of dual cycle in disaster response developed by (Francois et al 2009) where they stated “*the dual cycle model features the operational actions of disaster reaction and recovery, including an emergency response stage followed by rehabilitation and reconstruction stage*. On the other hand, we ensure the inclusion of strategic actions for disaster prevention and anticipation, such as the mitigation and preparedness stages. The following model in figure 2.5 depicts the dual cycle of humanitarian supply chains

- (1) Prevention and planning cycle

(2) Response and recovery cycle

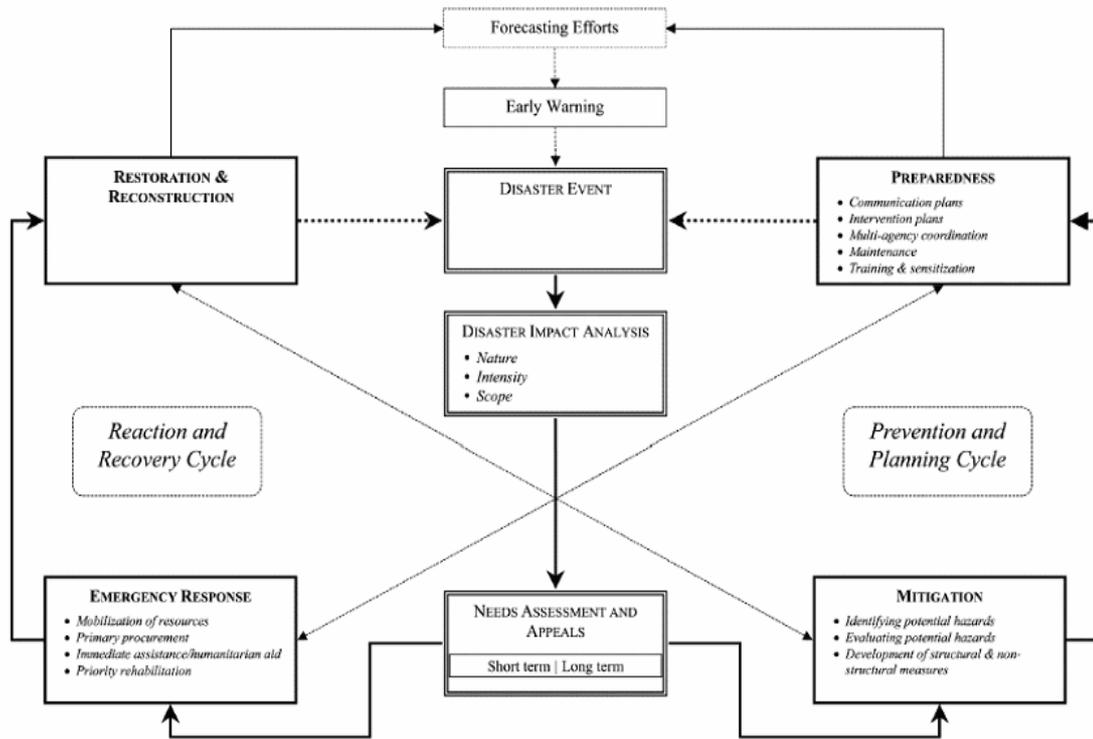


Figure 2-6: A dual cycle model of disaster relief operation (Francois et al, 2009)

Within each distinct cycle, the model reveals that stages are not mutually exclusive; rather, overlaps are common. Different stages and activities within these stages may even occur at the same time for different population segments, and some relief operations are relevant to more than one stage (Haas et al., 1977; Neal, 1997). The stages are not independent entities with one stopping and the next following (Hogg, 1980; Shaluf, 2008).

2.10 Supply Chain Structure and Fit.

We believe that similarities do exist between structures of *business supply chains* and those working in *humanitarian sphere*. If we evaluate what (Fisher, 1997) described for business supply chain then we can infer some to draft the elements of a strategic fit for humanitarian supply chain. The famous two supply chains structures “*responsive*” and “*efficient*” work fairly in a similar manner for humanitarian relief management.

Wassenhove (2006) wrote that "New phenomena always present a great challenge since the effects and impact are most likely unknown, with insufficient time for appropriate analysis of the situation. Supply chain *responsiveness* is the ability of the supply chain to rapidly address the challenge of speed and flexibility, changes and requests in the marketplace competitive advantage of a firm through supply chain responsiveness and SCM Practices by (Ashish, 2007). The sudden onset of a disaster also requires a flexible supply chain whose design might need to evolve from an initial emergency response to an ongoing reconstruction operation (Gattorna, 2006). Supply chain responsiveness is defined as the capability of promptness and the degree to which the supply chain can address changes in

customer demand (Holweg, 2005; Prater et al., 2001; Lummus et al., 2003; Duclos et al., 2003). During the emergency response, a supply chain could require an *entirely new design* from scratch that features rapid response capabilities and suppliers that can deliver a supplier-led solution that involves both innovation and creativity (Gattorna, 2006)..

Fisher (1997) elaborates on how we can take on uncertainty and tailor our supply chain to develop into a *responsive* manner. He has taken the products differentiated on the basis of demand certainty which we can link with *up-and-down certainty levels* in humanitarian relief. Fisher, (1997) suggests that there is always an inherent uncertainty associated with some products which the supply chains should come to terms with. Having done this one should strive to reduce *uncertainty* by accessing information

Fisher (1997) identified the structure for business supply chain; which clarifies the need for right supply chain design. Further explains that the supply chain designs depend on the nature of requirement of the business or it can more precisely be said that it depends on the products and how we position those products in the market. Also explained that supply chain design for functional products needs to be *efficient* and the cost is prime factor to be considered through out the supply chain. This structure suits the phase of "*post disaster*" In contrast to this the supply chain design for disaster response needs to be "*responsive*".

	Functional Products	Innovative Products
Efficient Supply chain	Match	Mismatch
Responsive Supply chain	Mismatch	Match

Figure 2-7: Supply Chain Fit (Fisher, L. M, 1997)

Fisher (1997) also differentiated these two types of supply chains in the following table:

Comparison of Responsive & Efficient Supply Chains

	Efficient Chains	Responsive Chains
Primary Goal	Supply demand at the lowest cost	Respond quickly to demand
Product Design Strategy	Maximize performance at a minimum product cost	Create modularity to allow postponement of product differentiation
Pricing Strategy	Lower margins because price is a prime customer driver	Higher margins because price is not a prime customer driver
Manufacturing Strategy	Lower costs through high utilization	Maintain capacity flexibility to buffer against demand/supply uncertainty

Inventory strategy	Minimize inventory to lower cost	Maintain buffer inventory to deal with demand/supply uncertainty
Lead Time Strategy	Reduce but not at the expense of costs	Reduce aggressively, even if the costs are significant
Supplier Strategy	Select based on cost and quality	Select based on speed flexibility ,reliability and quality

Table 2-1: Comparison of Responsive supply chain (Fisher, L.M, 1997)

3 Methodology

This chapter is about the methodology and approach we have used to study the differences of supply chain structures in disaster and post disaster phases of disaster relief management.

3.1 Research Methodologies

To address the purpose, questions, identified problems and implications of our paper we learned that both *qualitative* and *quantitative research* methods are useful for our research, Even though we have focused more on qualitative research due to the limited availability of expert logisticians. Potter (1996) explained that research methodology is a strategy applied to achieve goals and provides the blueprints that tell how the tools and techniques can be used Research

3.1.1 Qualitative Research

Qualitative research is unstructured interview with small samples, which produce ideas and hypothesis (Aaker & Day, 1990). Qualitative research is unstructured and based on small sample which entertain insights and by which the reader understand the setting of the problem (Malhotra, 1996). The reason for choosing qualitative research methods is helpful and beneficial in analyzing the complexities (Walker, Cooke & McAllister, 2008). Silverman (2001) states that there are four major techniques in qualitative research method.

- Observation
- Interviews
- Analyzing text and documents
- Recording and Transcribing

While designing our questionnaire we added two open ended questions to get feed back from expert logisticians, the questions are structured to identify the difference at operational level while carrying out relief activities in *disaster response* and *post disaster*

3.1.2 Quantitative Research

Quantitative research is the process of enumerative induction. The importance of quantitative method is that the data is collected from the organizations is more efficiently gathered, measured, and compared than that in qualitative method (Patton, 2002). Quantitative research is a methodology that seeks to quantify the data and it applies specially in some form of statistical analysis (Malhotra, 1996). Quantitative research is a form of definite research involving large representative samples and quite structured data collection procedures (Parasuraman, 1991).

3.2 Types of Research

There are three types of research available (Yin, 2003). These are *exploratory*, *descriptive*, and *explanatory*.

3.2.1 Exploratory Research

Exploratory research is a research in which the goal is to develop better understanding of the problem. Exploratory research is denoted as a hypothesis (Yin, 2003). The aim of exploratory research is to get maximum information in order to get comprehensive view of the problem for researcher. Exploratory research is usually deals with new topics, where not so much written about that research (Yin, 2003). We believed that our investigation matches with the requirement of exploratory study after performing a comprehensive literature review. The challenge we had was to spot the right persons in humanitarian logistics around the world. We managed to explore a lot of organizations across the world and we started contacting them. Later challenge was to focus on the right organizations and contact persons. Another idea we were working on was to have organizations from many destinations across the world to have a diversified data and views. The diversity in locations also gave us an opportunity to understand different views towards different types of disasters.

3.2.2 Descriptive Research

Descriptive research is used to generate data describing the composition of relevant group like salespersons, customers and organizations (Parasuraman, 1991). We aimed for the experts and professional humanitarian logisticians by contacting the leading organizations

3.2.3 Explanatory Research

Explanatory research is used for developing specific theories, which can be used to explain the empirical generalization. Wish to know "why" to explain, is the major application of explanatory research. While we were in the process of developing new theories and models we felt a strong connection to this than preliminary phases of work.

3.3 Types of Data

There are two types of data, which are used, in research. These are primary data and secondary data. Gathering of data is also very important task in writing a research thesis.

3.3.1 Primary Data

Primary data is defined as the data that a particular organization collects itself for the purpose of dealing with a specific problem (Gates & Jarboe, 1987). Primary data refer to the data that is collected by agents or ourselves who known to us. "Studies made by others for their own purposes represent secondary data to you" (Cooper & Schindler, 1998). Primary data has some more evident benefits than secondary data in the aspects of relevance and

accuracy. “Using primary sources, researchers can collect precisely the information they want” (Cooper & Schindler, 1998). Primary data is more reliable than secondary type due to the specific research purpose. Primary data is collected by your own creating and analyzing your own results. We sent a comprehensive questionnaire to have expert opinions on the problems we have identified for our research. We have also observed several delimitations which are described in later chapters.

3.3.2 Secondary Data

Most common source to get secondary data is social science include censuses, surveys, organizational records and through research and qualitative methods. It saves time that will otherwise be spent to collect data. Secondary data can be obtained from the previous research, journals, and other study literature, which may help in ones study research.

3.4 Data Collection Method

Collection of data include interviews, observing people and questionnaires, these are the three main data collection methods in research. (Sekaran, 2003). We conducted our research through the data collection method of questionnaire for the convenience of the humanitarian logisticians who are away in the fields due to the nature of their assignments.

3.4.1 Data Analysis

Data gathered from qualitative research are typically suggestive in nature and rarely if ever conclusive. However the analysis process needs to be planned. Qualitative research helped us to infer results based on an initial review of notes. Same as in quantitative research we are also extra careful in presenting our findings separately from our conclusions, in qualitative analysis we have drawn a clear line between our own observations and our interpretations out of it. Raw qualitative data through questionnaire was structured in order to have views of the experts through open ended and closed end questions. As this research is about distinguishing two phases of relief, actually supported our analysis as the questions did not need to be scaled other than options of agree and disagree. Just to justify the validity of questions we also gave a third option where the respondent could choose to disagree with the questions by saying its hard to distinguish.

3.5 Finding and Selecting Participant

To find right people for Interview process for this research was started quite early when even the questionnaire was in under development. We looked for such participants who could reflect upon the hard core logistics questions in humanitarian relief. It was worth it to start finding people earlier as we took a lot more time in building a comprehensive questionnaire then we actually planned. To find the experienced logisticians in

humanitarian relief organizations is hard and then to get time from them is even harder due to their busy schedules.

3.6 Making Connection

We contacted people from many organizations and the people we knew around the world to seek their insights to verify the differentiation between operations for “*disaster response*” versus “*post disasters*”. We short listed the suitable humanitarian relief organizations first and then we started contacting them through emails. After getting positive response from few participants, the questionnaire was sent to them along with formal cover letters to introduce our selves and our purpose.

3.7 Outcomes of Research Questions

The questionnaire was created in light of the reviewed literature. This literature review is a complete investigation to spot the differences in supply chain structures in initial days of disaster in comparison to the later days of post disaster phase. The data gathered were from professional humanitarian logisticians.

3.8 List of Participants.

- 1 Luc Dumoulin, Logistics coordinator, *International Federation of Red Cross Canada*.
- 2 Arshad Malik, Deputy country Manager *Concern International , Africa*
- 3 Elizabeth, Director *Caribbean disaster emergency management agency (CDEMA)*.
- 4 Yasir Razzaq, Sudan, Africa.
- 5 Faisal, Islamabad, *Save the Children USA..*
- 6 Hazme Akyol, Strategic Planner, MSB Sweden.

3.9 Opinions from Humanitarian Logistic Practitioners

We have selected the practitioners of humanitarian logistics who spend the most of the time in the field to assist the relief team with logistical challenges. We did not approach persons who are part of a humanitarian relief organization but not directly working with logistical challenges. We approached 31 companies of humanitarian relief with a formal email requesting them to share competence for our research and then after getting few responses we requested the contact persons in NGO’s to introduce with the co workers who have hands on working experience in humanitarian logistics. Actually the same thought process is reflected in the questionnaire we designed, we used the supply chain terminology to express the issues of discussion in a clearer way.

The first response we got from Luc Dumoulin who is logistics coordinator in International Federation of Red Cross Canada and he was just back from Haiti after finishing his relief assignments. In an answer to an open ended question (appendix question 33) on the

timings for the supply chain to respond to the post disaster needs of human which are rehabilitation etc, he answered *“search, rescue and emergency medical services are the first on the ground after a disaster. After the “saving live” phase the emergency relief phase is setup for a few months. Only at the end of the relief phase the rehabilitation and reconstruction will start. The recovery, rehabilitation and reconstruction phase does not start at day +7 or 8. This phase normally starts after 2 or 3 months”*. To the same question Arshad Malik from concern international responded that *“I believe that for purpose of continuity those organizations operating in init phase should continue to give ample time for the organization coming in to have some overlap time for a month or so”*. Elizebeth Klute Director disaster management of Caribbean disaster emergency management agency replied to the transition of organizations as *“The organizations for post disaster area relief should take over primary command in logistics and relief and should dominate services but Sea and Air Rescue should remain there for as long as their is any hope.”*

We put forward another key question to know the niche of the respondent’s organizations, Luc from IFRC he replied *“The Red Cross is specialized in first aid and emergency medical services for the first phase of the emergency. In the relief phase the Red Cross provides temporary shelter, sanitation, water and medical services.”* While responding to the same question Arshad Malik from Concern worldwide responded that *“most of the organizations I worked with have relief response as one of their major thematic area”*. It depicts that there are organization which have their respective areas of competence. Hazme Akyol from MSB of Sweden replied that *we support the UN with accommodations by building base camps and logistical support as core tasks. It is always easier to become really good at something if the organization focuses on a limited number of tasks.*

4 Analysis

In this chapter we have analyzed of the existing theories of humanitarian logistics and we have opted few models from commercial supply chains and in later pages we have designed few models where we feel that we can contribute in the research.

4.1 Responsiveness - A reflex action for “disaster response”

This is a fact that number of causalities is directly proportional to the amount of time consumed to reach the affected humans for rescue and relief services. According to Marcia "In the early response stage following a natural disaster, collaboration and coordination are essential because timely response can save lives" (Marcia Perry 2007). Unknowingly the aim of instant humanitarian supply chains for the phase of disaster response is to be "responsive". Unpredictability is a distinguishing feature of the on set natural disasters also surprises the humans many of the times. To be responsive for instant incidents requires a proper infrastructure and fixed costs where assets and relief teams are stand by to be responds to any emergency. Due to the unpredictability of the nature and location of sudden on set disasters it will always be difficult to use the right recourses required for the situation. The word "right resources" is very difficult to define clearly in first phase of "disaster response" as the trigger point for needed assessment and responsive supply chain is the same. An appropriate need assessment requires resources and a proper responsive supply chain need information.

Still this is direly needed to start both these phases together.

Thus responsive supply chain design for early days of disaster response has to be quick and relief supplies and human resources are pushed into the disaster area and by the passage of time when the clear information starts to arrive from area the right resources can allocated and requested. It is also very important for logisticians to not to focus on *efficiency* as key performance indicator for this phases as this it is not inline with the primary goal of this phase which is responsiveness. *A typical example of responsive relief is the firefighters where a lot of money is spent to build the right infrastructure as a precondition to the relief. While at emergency work the aim is to fight the fire as quickly as possible but not to control the amount of water utilized.*

4.2 Efficiency - Aiming for an extra mile during post disaster

In "post emergency" situations where relief actors have the challenge to deal with the refugees, orphans, injured, displaced and disable people. The supply chain should be transitioned to have new objective of being "efficient". If the organizations which work on free education for children want to operate from next day of disaster where people are highly insecure, homeless and injured this will not help the real challenge which people are facing at that point of time. The *post disaster* phase is the right time which direly needs the activities of supporting the community with a bit longer perceptive, also the actors have more time for

detailed planning. Paul and Rehman (2006) emphasized on the need for focus on broader understanding of response as part of long-term support for the affected communities. Further described by (Wassenhove, 2006) that disaster relief comprises of about 80% contribution from logistics, the only way to achieve this is through slick, efficient and effective logistics operations and more precisely, supply chain management. Furthermore narrates that setting up an efficient supply chain is always a complex operation but in the aftermath of a disaster humanitarian organizations have to deal with multiple interventions on a global scale and, often, concurrently. At the start, it is speed at any cost and the first 72 hours are crucial. At this stage goods may be flown in from abroad as quickly as possible despite being an expensive option. Later on (the first 90 to 100 days), it becomes a mixture between being effective in helping people and doing this at a reasonable cost. So humanitarians would start looking to buy the same goods locally.

“Comparatively in *post emergency* situations business processes can be used in contrast to the incident based initial phases of emergency response”. The challenges in “*post disaster*” phase are quite different to the ones present in initial time of “*disaster response*” due to the fact that supply chain is more predictable in nature and not instant. In this area the model formed below describes the different aims, methods and procedures of these two important phases of humanitarian logistics.

The implications of business practices in humanitarian logistics are of high importance to understand the differences of their motives. This perspective has not been widely discussed that for disasters like earthquake, floods, volcanoes and hurricanes where the logistics are needed on war footage to coup the emergency situation, the business perspectives and ideologies of profit maximization fails to support advancements in humanitarian aids on prevailed business methods, specifically when we speak about the “*disaster response*” phase. Generally speaking the word "business" is too much attached to the commercialism of it. The fact of the matter is that the ultimate objective has to fully support the affected humans and costs are not the ultimate drivers of humanitarian relief for initial phase of *disaster response*.

4.3 Right Supply Chain Design for Humanitarian Relief

It would really be useful if we make an initial dichotomy of the supply chains and elaborate on the characteristics of these on the basis of the resources delivered. This dichotomy is useful for the purpose to explain that there should not just be a single supply chain with which we should operate in relief operations rather there should be one which should be responsive given the onset disaster and it should have the ability of transformation into an efficient supply chain for post disaster with focus on Humanitarian logistics. For this we need a clear differentiation between a *responsive* and *efficient* supply chain taking both a business as well as a humanitarian perspective. Much has been written about supply chain responsiveness and efficiency in a business setting. Transition from responsive to efficient supply chain requires flexibility, planning, cooperation, specialization and right resources of

the actors. Supply chain responsiveness has its cost and benefits. The following figure 4-1 (Authors own model) shows a two phases and two supply chain structures,

	Disaster (First Cycle)	Post disaster (Second Cycle)
Responsiveness	High	Low
Efficiency	Low	High

Figure 4-1: Matching supply chain with two phasis of Disaster Relief (Authors own model, 2010)

The authors also show that although *efficiency* and *responsiveness* are needed in all the operations and phases but the point of difference is lower and high importance. A logical conclusion of supply chain responsiveness is that this chain must also be *flexible*. It goes without saying that a responsive chain is the one which is flexible at the same time so it can cater to the next phase of relief. Vickery et al (1999) defines supply chain flexibility as encompassing those flexibility dimensions that directly impact firms' customers and that are the shared responsibility of two or more functions along the supply chain, whether internal or external to the company. In responsive supply chain the goods delivered usually less price sensitive.

Supply chain *efficiency*, on the other hand, is the inverse of the cost of delivering a product to the final users. Efficiency too has its costs and advantages to cater to the right need of beneficiaries. Increase in costs lowers the efficiency and it is widely known that donors loose their interest in this phase so do the media. The concept of leanness is a logical conclusion of being efficient. Following differences shows the need for distinct designs of supply chain and logistics management to facilitate the humanitarian relief chains.

4.4 Dissimilarities in Operations of Two Phases of Disasters

With the help of a detailed questionnaire we spotted various in these two phases which are the base of our supply chain fit model where responsiveness is a key in initial days of disasters and efficiency is a must in the later phases of disaster relief. It is worth mentioning that the questionnaire we design as quite uncomplicated for data extraction due to comparative question between two phases of disasters. We also avoided to make scales of agreement and disagreement, or we can state that the vacuum in literature quite visible that we spotted it very easily so did the respondents who are having good experience in humanitarian logistics.

4.4.1 Cost

The major difference to start with is the cost which is not a prime driver of the supply chain in the initial days of the disaster where life saving activities is at their best and in later phase cost consciousness brings the efficiency factor.

4.3.2 Inventory Push Strategy

In initial days relief goods are pushed towards the disaster prone areas where as in later phases the demand is properly assessed and thus creates a pull factor for the needed items for humanitarian relief.

4.4.2 Transportation Nodes

Distribution of relief and first aid goods in initial days is done to disperse locations, sometime as door deliveries where as in later days there are less transportation nodes due to lesser consolidation points from sender and lesser distribution point at receiving end.

4.4.3 Procurement

Speed of delivery is the prime focus in the first phase which also drives the decision of supplier selection, where as the later phase is quite opposite where many other factors are taken into account. Some factors as, to support local community by sourcing from same area, to select supplier based on the cost benefit analysis.

4.4.4 Logistical Consolidation

A key performance indicator of supply chain is optimum utilization of transportation, can often be ignore in the initial phase of disaster in order to be responsive with the available means. In the later phase of post disaster, consolidation is well planned even if there are multiple suppliers. Also by defining minimum order quantity, assorted customized packaging and lead time adjustments results into better consolidation which brings efficiency.

4.4.5 Uncertainty in Donations

By the passage of time the donors loose their interest towards the affected people due to many reasons and the amount of donation decrease drastically, which also strengthens the idea of being *efficient* in the later phase of *post disaster* to utilize the scarce resources in better and sustainable ways.

4.4.6 Performance Measurement

Performance measurement of relief organizations in early days after disasters is quite harder due to the fact that many of the organizations are over lapping with other relief organizations as the objective to save lives at any cost. Where as in later phases performance of organizations is emphasized as well as can be measured with lesser complications.

There following table 4-1 (Authors own model) describes more differences at operational level to show how these phases are unique.

Responsive Supply Chain (Disaster Response)	Efficient Supply Chain (Post Disaster)
Buffer Stocks are vital	Routine/ predictable stocks
Set Up/ Start up of supply chain	Sustain the Supply Chain
Cost is not a prime driver of the chain (Average cost per unit delivered is higher)	Cost is of significant importance (Average cost per unit delivered is low)
Forecasting is not possible	Projections of needs can be made
Uncertain multi modal transportation	Structured flexible transportation
Logistical consolidation of is difficult	Consolidation & assortments is important
Due to the over load, excess and wrong goods sent, inventory pile up	Reverse logistics is planned to clear up unnecessary stocks
Procurement with lesser negotiation	Negotiation is important & time is available
Lead time needs to be shortest	Replenishment leads to longer lead times
Local sourcing is not the goal	Local sourcing is preferred
Finances are fetched easily (Donors are willing)	Donations are politicized
Distributions to Diverse location	Distribution to lesser locations
Large # of Volunteers available	Very few volunteers are available
Life saving/ Rescue focused Aid	Daily routine life aid
Large over lapping of Organizations	Overlapping is easily identified
Performance is hard to be measured	Performance can be measured and defined
Macro Management	Micro Management
Availability ,not specialization , is important for supplier selection	Specialization is of significant importance
Push based strategy	Pull based strategy
Cross Dock is compulsory	Pick Pack is possible
Less transparent sourcing & Supply chain	Transparency is must
Rigid supply chain (through put is less)	Supply chain may be flexible

Table 4-1: Comparison of humanitarian supply chain structures in disaster & post disaster (Authors own table)

The above differences in table 4-1 (authors own models) portrays key differences in these two phases which explains the need for two different mindsets through out the supply chain. Furthermore if we break down the strategic goals for humanitarian relief into the operational goals we direly need to have dissimilar structures for the “*disaster response*” and “*post disaster*”.

4.5 Distribution and Supply Chain Networks- a comparison

The distribution in disastrous situation starts with the donations or sourcing from multiple locations around the world and then gathered to hubs near the destination area to be distributed widely to the dispersed affected population. In contrast to this mostly the aid and support in *post disaster* time is distributed to limited locations e.g. in the area of relief camps or refugee camps. Also the people can come over to the distribution points to collect the aid. Russell (2005) explains that in most relief operations, supplies are brought close to the refugee camps for storage. The below model (author’s own model) explain that the first phase has a lot of consolidation points and final distribution from distribution points is towards many locations compare to later phase of “*post disaster*” where distribution network is less complicated.

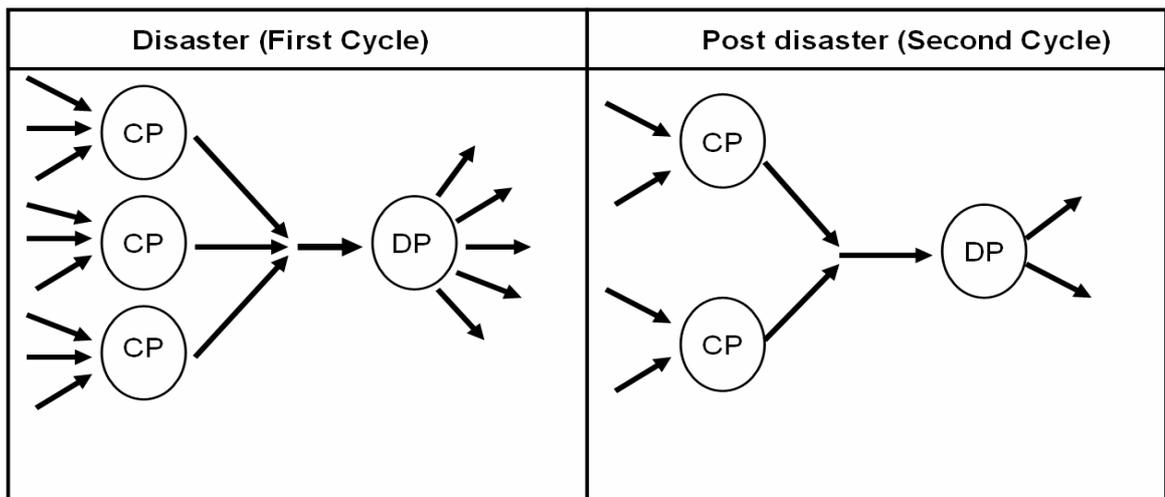


Figure 4-2: Transport nodes in dual cycle for humanitarian logistic (Authors own model, 2010)

4.6 Niches of Humanitarian Relief Organizations

This study also shows the importance of the clear niches of the helping organizations and this division will further be helpful for them to excel in respective areas. We strongly believe that a systematic way of approaching the disastrous location with a plan will be far more helpful, by saying this we refer to the activation of organizations which work for children care, old citizens, orphanage concerned, women rights, food aid, health, water supply etc from the very beginning as these organizations are already separates from rescue and emergency situations. Interestingly these development and reconstruction works can be well planned and executed.

4.7 Transition in Supply Chain Structures: from “responsive” to “efficient”

In business logistics, much has been written about the transition of supply chains from being efficient to responsive and transition of it but in humanitarian logistics the need is otherwise. The idea of two types of supply chain for one event highlights the need for the activation of both these supply chains simultaneously so the humans can be facilitated fully. It requires the "transition" of the supply chain from being responsive to the efficient supply chain. The actors and the leadership shift can also be observed in this transition which is something which should be defined and assigned through a systematic way. Because many of the organizations may lose their interest in rehabilitation and reconstruction of the disastrous area for many reasons or those experts may be self-restrained to the disasters and emergency situation. According to Wassenhove (2006) there are four clear phases within disaster management, First the mitigation phase where, for example, building on the shoreline in regions prone to tsunamis can be avoided, Second is the preparedness, third the response and 4th rehabilitation (Wassenhove, 2006). Russell (2005) explains the unsuitable goods sent to disaster place, In Sri Lanka, unwanted aid piled up at government buildings, aid agencies, and refugee camps. Many weeks after initial appeals for water, significant numbers of boxes of bottled water continued to arrive after the water and sanitation services were restored. Winter jackets, winter tents, expired cans of salmon, cologne, high-heeled stiletto shoes, and sequin-studded black evening dresses were sent by well-meaning people and organizations (Barta & Bellman, 2005). Russell (2005) explains that As each agency sets up its own supply chain and starts procuring necessary supplies, the multiple relief chains can compete against each other. This is wasteful and slows the relief process. If transition is kept in focus then agencies can work cooperatively by selecting niches of their own. The following figure explains the human aspect of transition which put forward the demand for humanitarian supply chains to be aligned thus to attain goals of relief.

The phenomena of “transitions” of business logistics differs from humanitarian context. Fisher in fact has not provided any mechanism to help in understanding in what ways a chain be made efficient if there is a mismatch or the market conditions demand so as we do not always require a responsive chain. There are conditions and products that demand efficiency. This is also an important point for our paper as we want to suggest a mechanism which provides practitioners with hands-on knowledge as to how a transition from responsiveness to efficiency be made as we move from the phase when disaster strikes to the post-disaster phase in humanitarian aid operation and strive till the final accomplishments are done. Edward (2005) explains When a community is disrupted, family and community structures and local and state politics are affected. These changes can impact the vulnerability of people in different ways. Disasters, however natural, are discriminatory. When they strike, pre-existing social structures determine who will be less affected and who will pay a higher price

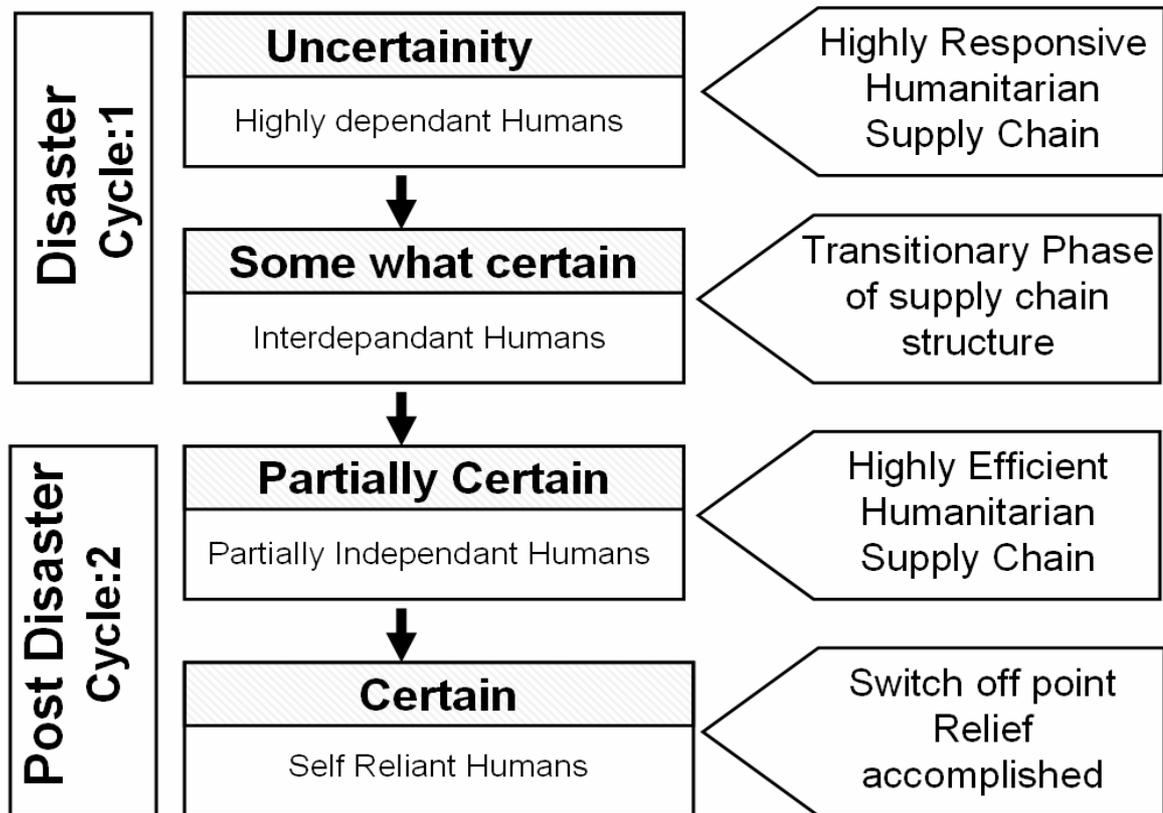


Figure 4-3: Steps of humanitarian logistic relief supply chain for humanitarian logisticians (Authors own model, 2010)

The above shown model 4-3 (Authors own model) explains the important missing link in humanitarian logistics study which focuses on human conditions throughout the relief process which is a key driver for the process. It also shows that how human conditions drive the need for the supply chain designs to go hand in hand. Responsiveness is direly needed towards the humans when they are highly dependant. Next phase of interdependency for humans is where the supply chain is taking a turn toward new goal of achieving efficiency in supply chain. This model does not cover the phases of preparedness and early warning. *This is a fact that humanitarian relief is about humans and we need to keep them in focus throughout the relief process either these are operation goals or of strategic importance.*

4.8 Reverse Logistics.

The lack of reverse logistics in the supply chains after the crisis shows the lack of interest of NGO's in the businesses where aid and in kind funding are done by others. If excess supply is made due to wrong demand assessment it can be used .The materials and goods which are excess in the supply line are most likely to be used in the similar areas based on the mobilization table based on the climate, demographics, culture, weather and nature of disaster. The need for reverse logistics in humanitarian logistics is confirmed from the literature review. We strongly suggest a comprehensive future study on the reverse logistics, where we see that a lot can be learnt from existing commercial theories.

5 Conclusions

This chapter consists of the delimitations of scope of study accompanied with conclusive notes on supply chain structures of humanitarian logistics.

We believe that is a theoretical model and is required to be tried for its validity in respective fields of humanitarian logistics in disasters management. The respondents we carefully chose for this research are humanitarian logistic experts but still their back ground, circumstances and exposure to limited types of disasters can be a limitation toward this model. Also this model is developed on the basis on the assumption for ease that there are ideal conditions of resources and relief workers have the appropriate opportunities to switch the supply chains from responsive mode to efficient mode and it requires specialized infrastructure.

It is worth mentioning again that our focus is limited to natural on set disasters. Its application to all disasters can be better judged by experts on the basis of specific situations and locations. Initially we wanted to generalize the scope with out discriminating the man made disasters but we learned that these issues are very complex due to biased views and political nature of these disasters.

We see this as a paradigm shift in humanitarian logistics and we are hopeful that it can motivate a lot of researchers to build up furthermore. We wish humanitarian logistics to excel further more than the business logistics which always faces fierce competition and lack cooperation between organizations. We have also observed that the expert writers and researchers in the field of humanitarian logistics are extremely limited.

6 Implications and ideas for future Study

In this chapter we have listed the implications for actor of humanitarian relief. Also we recommend and identify the potential areas where we look forward to see that the future researchers can explore further more to enable the relief organizations to be efficient or responsive according to the situations.

6.1 Implications for the Actors in “Humanitarian Relief”

By addressing all “actors” we are emphasizing to increase the scope of study from just only logisticians to all other participants of relief due the fact that supply chain design involves many other actors than just the humanitarian and third party commercial logisticians. Thus the involvement of every actor is very important for the integration of supply chain to achieve the same goals with synergy. It is vital for organizations, governments, military personals, NGO’s, aid agencies, contractors, suppliers, logisticians, local community and donors to understand that how the needs changes over time and how the flow of the funds, relief goods, personnel and transportation should be managed over the period of time. It is also valid for the actors to specialize in respective fields instead of striving to excel in every phase. This will lead to micro management of disaster relief management.

The first phase of disaster response is like a reflex action and efforts are put and push strategy is used for aid and we see that there is a need for quick need assessment to be done so the efficient supply chain can start working at the same time as responsive supply chain do. This fact can also be recognized on the basis of longer lead times of replenishment of stocks and resources.

6.2 Future Study Recommendations

Together with the implications of this study we see a scope in extended these ideas for suture study in the supply chain fit for humanitarian relief. It can be a totally new dimension and paradigm shift if we initiate the studies of separating the supply chain structures on the basis of *responsiveness* and *efficiency*.

6.2.1 Niche of Relief Organizations

We highly recommend further study in defining the clear niches of humanitarian relief organizations to specialize in respective areas of *responsive* and *efficient* phases of humanitarian supply chains. Furthermore after describing a clear “*job description*” the actors may improve the issues of unnecessary competition, less cooperation and overlapping between all actors of humanitarian relief. Further research can also help to explain the positioning of the humanitarian organizations which will lead to define the specific *key performance indicators* for the humanitarian organizations.

6.2.2 Transition between Supply chain structures

We observe that there is a need for further study on the smooth transition of the supply chains from being *responsive* to being *efficient* later by utilizing the minimum allocation of new

resources. Ideally the earliest transition into efficient phase is good subject to the circumstances and what measures can be taken to avoid the wastage of resources from phase of “*disaster response*” to “*post disaster*”

6.2.3 Inspiration from Commercial Supply Chain

It is also inferred that while applying the business logistic practices it should be considered that it is relatively more relevant to *post disaster* humanitarian relief work where benchmarking of best business logistic practices can be done. We seek that there is a lot more room to learn from business logistics given that we know what to skim from it for the betterment of humanitarian logistics.

6.2.4 Performance Measurement

We suggest that performance measurement should be separately measured in two different phases with in one disaster incident; because the goals are quite contradictory to each other due to differences in objectives. Also we believe that continuous performance measurement for improvement will be more relevant in later phase of *post disaster* due to its nature and comparatively longer time span.

6.2.5 Reverse Logistics

As wrong goods are sent to the disaster area to enormous reasons it is of key importance to promote the reverse logistics process through the departments of relief organizations or commercial reverse logistics firms. After defining a clear supply chain structure for two phases responsibilities of reverse logistics and need for recycling should also be studied in future. Because we think that while talking about better integration of humanitarian relief organizations this role is quite vital.

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8 Appendices

Appendix 1. Questionnaire for humanitarian logisticians

Ziyad Bashir Awan & Zia ur Rahman

Jönköping International Business School,

Sweden, Tel: 0046-769276009

Email: xeyyad@gmail.com

Dear Participant,

As part of our master's research, we are in a process to develop a theoretical model on humanitarian logistics with a focus on dual cycle of relief. We are guided by our tutors Johan Larsson and Helgi-Valur Fridrikson.

We believe that relief organizations all around the world prepare them selves for an expected disasters in order to quickly design or modify the supply chain every time to fit the unique situations. The dual cycle of supply chain is described as

- (i) Disaster reaction and recovery, including an emergency response stage
- (ii) Post Disaster, Rehabilitation and reconstruction stage which requires these organizations to focus on key competence areas with a greater focus.

The questionnaire enclosed is designed to spot the difference between the supply chains of initial "disaster" and "post disaster" situations. You being an experienced professional in humanitarian relief will be in the right position to give us the necessary information needed for this research. We request you to answer to the questions freely and openly to share your competence and knowledge with us.

If your organization believes that the name of company should not be disclosed, we will respect the confidentiality. You and your organization's help in this good cause is greatly acknowledged

Thank you

Ziyad Bashir Awan & Ziaur Rahman

April 25, 2010

Jönköping, Sweden

Please help us to know your contact details.

Name of company.

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Company contact, please provide the details.

Name and address of Company contact:	
Name:	
Title:	
Working experience:	
Telephone #:	
E-mail address:	
Mailing address:	
Date:	

Introduction about focus of research:

This questionnaire is designed with a focus on comparative study between “**Disaster response**” situation and “**post disaster**” situations. The situations have following diverse challenges for humanitarian relief organizations,

Disaster Challenges	Post Disaster Challenges
Initial Days Emergency, Rescue & First Aid	Later Days (+7-8 days to many Days/ Years) Recovery, rehabilitation & reconstruction

Questions: Please type “ X ” to select one option.	Options (select by writing X)		
	Sudden onset Disaster Initial Days	Post Disaster Recovery, Rehabilitation, reconstruction	Its hard to distinguish
1. “Early & quicker response” in Humanitarian supply chain networks is comparatively more linked to the ___ phase due to multiple reasons.			
2. According to you; life saving activities, rescue & first aid is a major focus for Humanitarian relief organizations in?			
3. Volunteers are relatively more enthusiastic and easily gathered to assist the community and humanitarian logistics organizations in			
4. Supply chain is set up and established to quickly respond to a disaster, Do you think so? Please choose the option that at which point the Supply chain is initiated?			
5. Reverse logistic is a term used to send back the goods to the origin, is mostly needed in Hum log due to wrong or excess goods sent, it is more needed in the phase of			
6. Logistical consolidation is easier due to planned shipments, cost focus and availability of time in phase of.			
7. Local sourcing is appreciated in Humanitarian logistics to support local community, but its not the goal in			
8. Procurement of relief goods is based on the availability, not cost for many reasons in,			
9. Procurement of relief goods, cost, lead times, is considered and negotiated for supplier selections in			
10. Extensive support from all humanitarian relief actors is needed in initial days where as in later days overlapping is avoided or work is assigned?			
11. Inventory push strategy is used for relief goods and resources with an emphasis on quick distribution in ?			

Questions: (Cont.) Please type “ X ” to select option	Sudden onset Disaster initial Days	Post Disaster Recovery, Rehabilitation, reconstruction	Its hard to distinguish
12. Aid, funds and finances are comparatively easier to fetch in which phase? Due to various reasons including media attention, publicity and sympathies of donors etc.? Or?			
13. Demand assessment for type and quantity of relief goods is comparatively more accurate in one phase of the two? Or its hard to distinguish?			
14. Semi finished buffer stocks for continuous replenishment are maintained for certain need comparatively more in,			
15. Local sourcing is preferred in Post Disaster situations, whereas in immediate response phase availability from any where is focused. Or?			
16. Inventory Velocity is prime, supersede the cost consciousness in.			
17.Speculation – The manufacture of product for inventory, rather than to stock or to order, in anticipation of subsequent demand – the opposite of postponement, here, risk is assumed to reduce stock outs/uncertainty is a key to respond to			
18.Throughput – The amount of material that moves through a facility during a given time, is more stable in			
19.Advanced Planning and Scheduling (APS) is applicable certain situations, I think it can be sued in			
20. According to me, Air cargo from around the world, toward the affected country is comparatively more used in			
21. Average cost/unit/beneficiary of relief goods is higher in			
22. Do you believe that assorted packaging and pick and pack method are more needed hence used in the phase of			
23. Transport nodes are comparatively more in?			
24. Transportation Models are more complex due to lack of infrastructure in immediate disaster phase or In later recovery days?			

Questions: (Cont.)	Options (select by writing X)		
Please type “ X ” to select option	Sudden onset Disaster Initial Days	Post Disaster Recovery, Rehabilitation, reconstruction	Its hard to distinguish
25. According to you, loose cargo & non standardized pallets packaging are bigger challenge more in ..			
26. Do you agree that strategic warehouse house location selection are quickly finalized & established in later phase of disaster as it takes some time? Or ?			
27. Spot Demand: Demand, having a short lead time that is difficult to estimate, is a bigger challenge in			
28. LIFO/FIFO inventory methods are less focused, as the aim of immediate need fulfillment supersede this method in the phase of ?			
29. Push Distribution: The process of building product and pushing it into the distribution channel without receiving in complete or any information regarding requirements. I believe this is more linked to			
30. Specialization of NGO's is preferred for better integration and collaboration among each other, Is structured, designed and negotiated in later phase of disaster, or ?			
31. Delivery lead times from manufacturer till distribution center are longer due to the available time and replenishment effect of goods.			
32. Performance measurement of humanitarian supply chain actors is easier to monitor in less chaotic situations, due to less over lapping of organizations in			

Please Comment on the following statement:

33. “After certain days of sudden onset disaster, the chances of finding alive people under rubble, debris or in flooded waters diminishes”

Do you think; that this point in time the departments/teams of relief organizations which are specialized in rehabilitation, health, drinking water, food and education should step in and replace the first organizations of rescue and first aid?

Some more about you esteemed organization, Does your organization has a niche within “Humanitarian relief”? If so does it help to Specialize in respective areas?

Many thanks! We really appreciate your time for now and special thanks your continuous support to humanity.