

*Humanitarian Logistics:
Empirical Investigations of Influences on Logistical
Activities of Humanitarian Organizations*

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to all those in need

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When I first heard about the logistical challenges in humanitarian operations about ten years ago, I was really interested. At that time, I did neither know what this special subarea of logistics was called nor that it had only been the subject of research for a few years and that I would one day be part of it. Prof. Rainer Lasch was one of the first people who made me familiar with this topic. He always gave me the opportunity to work in this field - starting with teaching during and supervising my bachelor's and master's thesis up to my work as a research associate and the supervision of my doctoral thesis. I am thankful for the opportunity to develop myself and to be able to go my own way in terms of my research topic, for the willingness to do things differently, and for the time he always took for me.

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Christian Hein, Berlin, June 2021

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List of Abbreviations

AA	German Federal Foreign Office (Auswertiges Amt)
ADRC	Asian Disaster Reduction Centre
ADW	Alliance Development Works
ALNAP	Active Learning Network for Accountability and Performance
BINGO	Big International Non-Governmental Organization
BMZ	Federal Ministry of Economic Cooperation and Development (Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung)
CRED	Centre for Research on the Epidemiology of Disasters
CSO	Civil Society Organization
DRK	German Red Cross (Deutsches Rotes Kreuz)
DZI	German Central Institute for Social Issues (Deutsches Zentralinstitut für soziale Fragen)
EM-DAT	International Disaster Database by CRED
ERP	Enterprise-Resource-Planning
ERU	Emergency Response Unit
EU	European Union
FAO	Food and Agriculture Organisation
FBO	Faith-Based Organisation
GIZ	German Corporation for International Cooperation (Deutsche Gesellschaft für Internationale Zusammenarbeit)
GFDRR	Global Facility for Disaster Reduction and Recovery
GLIDE	Global Identifier Number
HC	Humanitarian Coordinator
HCT	Humanitarian Country Team
HQ	Headquarter
IASC	Inter-Agency Standing Committee
ICRC	International Committee of the Red Cross
ICVA	International Council of Voluntary Agencies
IFRC	International Federation of Red Cross and Red Crescent Societies
IOM	International Organization for Migration
IT	Information Technology
KANK	Catholic Working Group for Emergency and Disaster Relief
KLU	Kühne Logistics University
LSP	Logistics Service Provider
MSF	Médecins Sans Frontières (Ärzte ohne Grenzen)

NGO	Non-Governmental Organization
NPO	Non-Profit Organization
OCHA	United Nations Office for Coordination of Humanitarian Affairs
OECD	Organisation for Economic Co-operation and Development
OHCHR	Office of the High Commissioner for Human Rights
RC	Resident Coordinator
RQ	Research Question
SR on HR of IDPs	Office of the Special Rapporteur on the Human Rights of Internally Displaced Persons
THW	Federal Agency for Technical Relief (Technisches Hilfswerk)
UIA	Union of International Associations
UN	United Nations
UNDAC	United Nations Development Assistance Committee
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNHABITAT	United Nations Human Settlements Programme
UNHCR	United Nations High Commissioner for Refugees
UNHRD	United Nations Humanitarian Response Depot
UNICEF	United Nations Children's Fund
UNISDR	United Nations Office for Disaster Risk Reduction
UNRWA	United Nations Relief and Works Agency
VENRO	Association of German Development and Humanitarian Aid NGOs (Verband Entwicklungspolitik und Humanitäre Hilfe deutscher Nichtregierungsorganisationen)
WANGO	World Association of Non-Governmental Organizations
WASH	Water, Sanitation, and Hygiene
WFP	United Nations World Food Programme
WHO	World Health Organisation

1 Introduction

1.1 Motivation

To write the motivation of a thesis in the context of humanitarian relief while keeping up to date is like a Sisyphean task. Again, and again new disasters occur on our earth, which gives this topic its particular relevance. This becomes clear just by examining the most devastating natural disasters of the last five years (roughly the period of time in which this dissertation was written): 2015 earthquake in Nepal (8.831 deaths, 5.6 million people affected), Hurricane Matthew in 2016 (595 deaths, 2.4 million affected), 2017 Landslide in Sierra Leone (1.102 deaths, 12.000 affected), 2018 earthquake in Indonesia (4.340 deaths, 209.000 affected), and 2019 Measles in the Democratic Republic of Congo (5.400 deaths, 250.000 affected) (CRED and UCLouvain, 2020). In addition, disasters that occurred even longer ago cast their long shadows on the work of humanitarian actors. The earthquake in Haiti in 2010 with more than 220,000 deaths is exemplary here (CRED and UCLouvain, 2020). Even today, there are still over a hundred different organizations with humanitarian and development activities on-site. The statistics of recent years indicate that the increase in disasters is not only a subjective perception. Figure 1.1 shows the number of registered natural disasters since 1900. Especially over the last 50 years, there has been an apparent increase, since about 2000 the number has been slightly decreasing on a high level. Measured in terms of the number of fatalities, no such trend is discernible; here, individual major catastrophes, such as the 2004 tsunami in the Indian Ocean or the earthquake in Haiti in 2010, are causing particularly severe devastation. By contrast, an increase in the number of people affected and, in particular, the property damage caused by natural disasters can be seen over the last 50 years (cf. Figure 1.1). Even though the absolute economic losses are greater in high-income countries, the relative damage is far higher in low-income regions, further hampering their development. According to UNISDR (2015), climate change will increase expected losses in the future. Unfortunately, not only are natural hazards triggering human suffering, but man-made conflicts are also inflicting immense harm to people and communities. The crisis in Syria has forced more than 5.6 million people to leave the country, and a further 6.6 million Syrians are registered as Internally Displaced Persons (UNHCR, 2020a).

The most severe humanitarian challenge of the current time is the coronavirus Sars-CoV-2. It makes it obvious that no country is immune to disaster, and even well-prepared countries can be affected massively. The full extent of this tragedy will indeed only become apparent in the coming months and years. However, particular attention

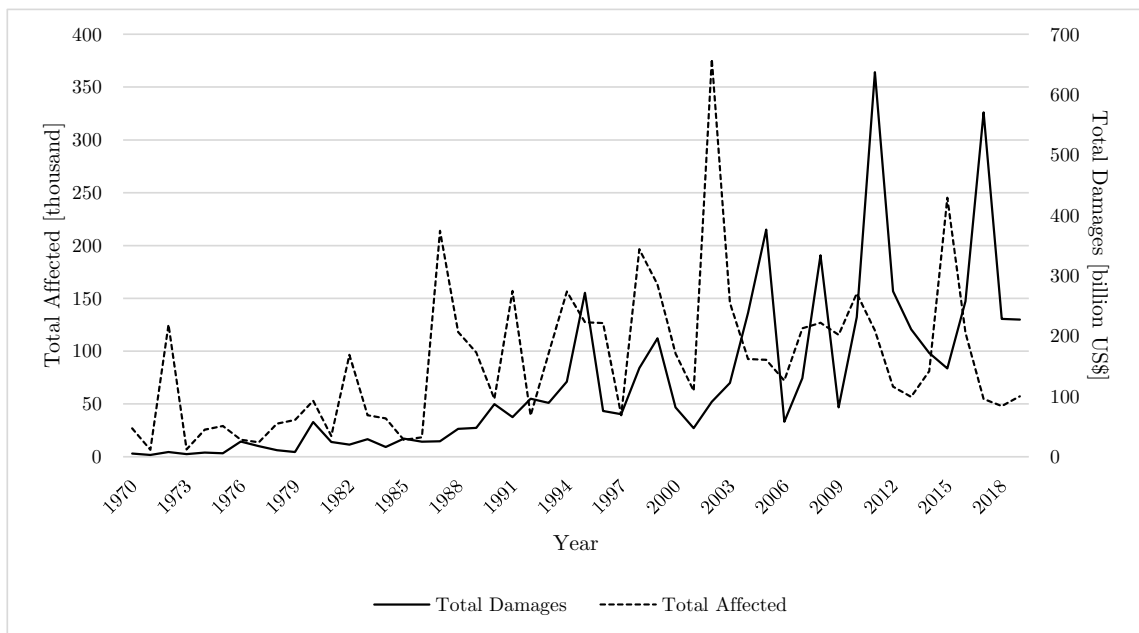
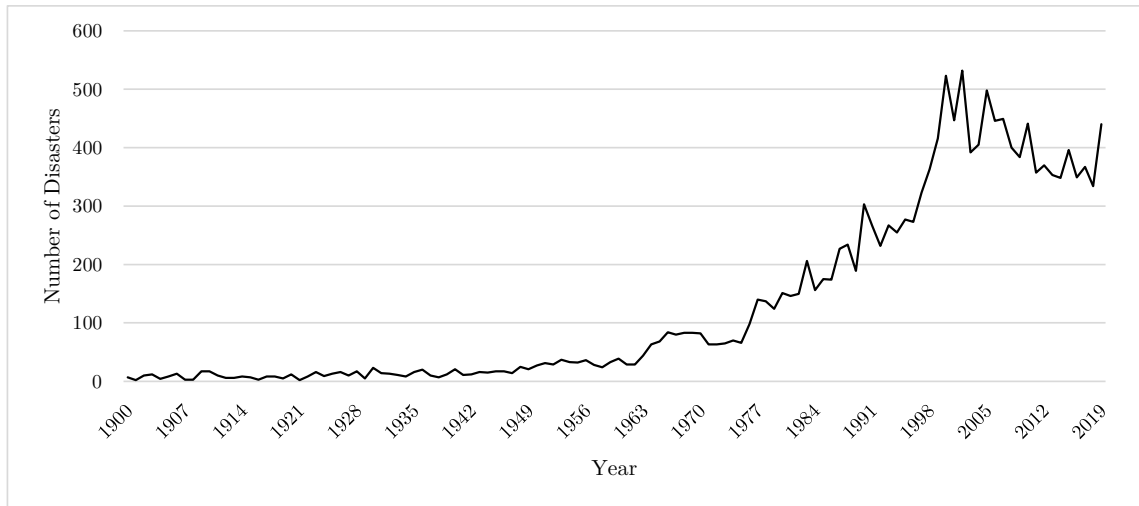


Figure 1.1: Number of Natural Disasters, 1900-2019; Consequences of Natural Disasters, 1970-2019 (CRED and UCLouvain, 2020)

should be paid to those countries that are highly vulnerable due to a weak health system and widespread poverty among large parts of the population. The populations of such countries or regions are dependent on external assistance. The volume of humanitarian assistance has increased significantly in recent years (Deloffre, 2016). In 2020, it is estimated that nearly 168 million people worldwide will need humanitarian assistance and protection at some point, with the greatest needs concentrated in a few countries (in Yemen 24 million, Syria 16.6 million, and the Democratic Republic of Congo 15.9 million people in need). It is expected to reach about 212 million people in need in 2022 (OCHA, 2020a). Regarding the number of personnel in the humanitarian sector, there has been considerable growth. There has also been a continuous increase in expenditure on humanitarian aid, reaching 28.9 billion US\$ in 2018. Private donations account for 6.3 billion US\$. The vast majority is provided by governments and EU institutions, whereby a small number of donor governments account for the majority of these public funds (Development Initiatives, 2019). The money is channeled through a variety of different actors, which can be divided into the following: The Red Cross and Red Crescent Movement, UN agencies, and NGOs (Harvey et al., 2010). The commitment of these actors shows its impact, as the following examples demonstrate: In 2019, 28.9 million children were vaccinated against measles globally, 32.2 million people were provided with safe water, and for 3.4 million refugees in 39 countries more than 134.500 tents were delivered. In Yemen and Syria, 13.4 million people had access to general food distribution (OCHA, 2020a).

In response to disasters, the difficulty is to provide sufficient emergency supplies exactly when and where they are needed. Particularly uncertainties regarding trigger, time, and extent of disasters pose significant challenges to the responders and increase the complexity of humanitarian operations (Chakravarty, 2014). Logistics is an essential element of any disaster relief operation, as it significantly influences the effectiveness of relief and determines the speed, the coverage, and thus the costs of humanitarian organizations (Kovács and Spens, 2007; Baumgarten, 2011). Financial expenditure on logistics can cause high costs, especially in the acute phases following the outbreak of a disaster (Hein et al., 2020a). Humanitarian organizations are, therefore, under pressure to make logistics activities efficient and transparent (Van Wassenhove, 2006). For this reason, so-called humanitarian logistics is in the focus of an increasingly comprehensive research base that aims to address the challenges in disaster management (Kovács and Spens, 2007). However, the practical applicability of research results remains limited (Leiras et al., 2014). Kunz et al. (2017) identified different reasons for the discrepancy between science and practice, including poor problem definition and low contextualiza-

tion. The particular characteristics of the humanitarian context are further highlighted by Pedraza-Martinez, Stapleton, and Van Wassenhove (2013). One reason for the lack of applicability in humanitarian logistics research can be seen in the diversity of humanitarian actors. Solutions are, therefore, rather specific and difficult to generalize or to transfer. There is only limited work on systemizing the characteristics of humanitarian organizations regarding aspects relevant from a logistical perspective (Hein, 2019). In response to this criticism, qualitative research, and in particular case study research, has emerged in the field of humanitarian logistics as the most commonly used method (Chiappetta Jabbour et al., 2019).

1.2 Scope and Research Questions

Research on humanitarian logistics has its origins in the catastrophic situation following the tsunami in the Indian Ocean in 2004, where it has become very clear that a large number of actors need coordination, especially from a logistical point of view (Chia, 2007). As a result, the first scientific studies and exchange on logistical issues were conducted. The Fritz Institute was in charge of the first thematic discussions (Thomas and Kopczak, 2005). The first and subsequently frequently cited articles were those by Van Wassenhove (2006) and Kovács and Spens (2007). The number of scientific publications increased steadily in the following years. The first literature reviews on the topic were those by Overstreet et al. (2011), Natarajarathinam et al. (2009), and Kunz and Reiner (2012). As the number of publications increased, comprehensive reviews on the topic became more and more difficult and specialized reviews became common (Caunhye et al., 2012). The most recent and comprehensive reviews are those of Leiras et al. (2014), Behl and Dutta (2019), and Chippetta Jabbour et al. (2019). The latter examined the articles published between 2007 and 2017 based on eight categories, systematizing them accordingly, and proposing future research steps. It becomes clear that most of the articles are theoretical with a low linkage to specific locations or types of disaster, or to specific types of a humanitarian organization.

Even though the research field of humanitarian logistics has grown considerably in recent years, and new approaches are constantly being developed to meet the specific challenges of the field, there is criticism that research lacks the necessary practical relevance (Leiras et al., 2014). Kunz et al. (2017) identified different reasons for the discrepancy between science and practice, including poor problem definition and low contextualization. The particular characteristics of the humanitarian context are further highlighted by Pedraza-Martinez et al. (2013). In response to this criticism, qualitative research, and in particular case study research, has emerged in the field

of humanitarian logistics as the most commonly used method (Chiappetta Jabbour et al., 2019). According to Vega (2018), transparently documented, trustworthy, and rigorously conducted case studies have the potential to contribute to advancements in humanitarian logistics research. However, his findings also show that the rigor with which such scientific papers are produced is not necessarily provided. There is a lack of specific guidance on how to conduct case studies. Therefore, the first aim of this thesis is to systematically analyze the challenges in case study research in humanitarian logistics and to develop practical recommendations for action (**RQ1**).

In the context of humanitarian assistance, it is noted that logistics account for a considerable proportion (up to 80%) of disaster relief costs and tasks (Van Wassenhove, 2006; Whiting and Ayala-Öström, 2009; Day et al., 2012). Logistics plays a crucial role in humanitarian operations. It influences the effectiveness of relief significantly and determines the speed, the coverage, and thus the costs of humanitarian organizations (Kovács and Spens, 2007). Unfortunately, the academic literature does not provide more detail concerning the proportion of logistics efforts in humanitarian operations. Hence, it remains unclear whether the stated numbers actually relate to one specific organization or type of disaster or which activities are included within the term logistics. There is no profound survey on the costs of logistics in humanitarian operations or of humanitarian organizations. Therefore, the second aim of this thesis is to provide clarity about the level and the relevance of the logistics cost of humanitarian operations (**RQ2**). The underlying connection between the objectives, the cooperation, as well as the processes of the humanitarian actors and their resulting costs are of particular importance in this context.

The results of the previous research show that the individual actors of humanitarian aid, are very heterogeneous and, therefore, a general statement about the amount of logistics costs is not feasible. This diversity of humanitarian actors could also be a reason for the lack of applicability in humanitarian logistics research. Solutions are therefore rather specific and difficult to generalize or to transfer. There is no systematic characterization of humanitarian organizations with regard to aspects relevant from a logistical perspective. This applies especially to the group of non-governmental organizations (NGOs), which is very diverse and inconsistent and can have worldwide networks that are considerably segmented (Eberwein and Reinalda, 2016). Therefore, the third research goal is to provide a systematic overview of these humanitarian actors in order to align scientific research and to foster practical exchange between organizations which are more or less similar (**RQ3**). The results of this study show that the international structures of NGOs have a significant influence on logistical issues

in the humanitarian context. The organizational structures of humanitarian actors, in general, can be considered as an under-researched area (Lewis, 2003). Therefore, the fourth and final aim of this thesis is to investigate the organizational network structure of humanitarian NGOs and discusses resulting influences on logistical issues (**RQ4**). In summary, this thesis will answer the following four main research questions. These research questions are split into sub-questions within the respective chapters.

RQ 1: What are the challenges in conducting case study research in the context of humanitarian logistics, and how can these challenges be addressed?

RQ 2: How is the level and the relevance of logistics cost of humanitarian operations concerning the actors' characteristics influenced?

RQ 3: What are the differences of humanitarian NGOs regarding aspects relevant to logistical issues and how can these NGOs be classified systematically?

RQ 4: How does the organizational structure of humanitarian NGOs influence their logistical activities?

For a transparent presentation of the scope of this thesis and the classification of the four research sections (Sections 3-6), they are, following Chiappetta Jabbour et al. (2019), assigned to the eight categories (Table 1.1). All four research contributions refer neither to a concrete economic context, nor to a specific disaster type or region, nor a specific phase in disaster management. Thus, they are consistent with most of the papers examined by Chiappetta Jabbour et al. (2019). One reason for this can be seen in the conceptual orientation of the contributions. A limitation to certain types of disasters or certain regions would only unnecessarily limit the object of investigation without adding any extra value. The focus of the papers is on aspects related to logistical issues rather than supply chain management issues, also in accordance with most of the papers. The unique feature of the following research contributions of this thesis is the specific focus on NGOs as actors of humanitarian assistance. This area of research can be regarded as underresearched. Moreover, the research methodology applied in the context of this thesis is to be highlighted; qualitative research, especially through case studies, is particularly emphasized (Vega, 2018). The detailed methodological design of the research contributions is described in the following section 1.3.

1.3 Research Design

In order to answer the research questions within the context of this thesis, an appropriate scientific methodology is essential. To represent and classify the research process

Category	Research 1	Research 2	Research 3	Research 4
Economic context	Not applicable	Not applicable	Not applicable	Not applicable
Focus	Both	Logistics	Logistics	Logistics
Method	Interviews	Multiple case study	Other qual. approach	Multiple case study
Type of disaster	Not applicable	Not applicable	Not applicable	Not applicable
Phase of disaster relief	Not applicable	Immediate response	Not applicable	Not applicable
Type of humanitarian organization	Not applicable	BINGOs	BINGOs	BINGOs
Region of authorship	Europe	Europe	Europe	Europe
Region of disaster	Not applicable	Not applicable	Not applicable	Not applicable

Table 1.1: Classification of Research According to Framework of Chiappetta Jabbour et al. (2019)

as a whole, Saunders et al. (2019) describe this with the help of their model of the research onion (cf. Figure 1.2). The outer layer of this research onion describes the basic philosophical orientation of a research project or rather of the researcher. This fundamental position on beliefs and assumptions about the development of knowledge can have a decisive influence on the methods used and the underlying assumptions. Three distinct types of research assumptions can be distinguished to demarcate the distinct research philosophies: ontology, epistemology, and axiology. The former refers to the nature of reality itself, the next to assumptions about knowledge and the latter to the role of values and ethics (Saunders et al., 2019). Thus, different basic types of research philosophies can be distinguished from each other. An exact allocation is neither always possible nor necessary. Rather, the aim is to create a reflective attitude as researchers to the context in which a selection of research methods takes place (Johnson and Clark, 2006). In the scope of this thesis, a basic position, according to Critical Realism is adopted to a certain extent. This philosophical position assumes the existence of an external and independent reality that is at least to a certain extent, perceptible and recognizable by humans. However, this perception is limited and represents only a small part of the greater whole. The aim is, therefore, to provide explanations for observable events by investigating the underlying causes and mechanisms (Saunders et al., 2019).

The next layer of the research onion describes the approaches for developing theory. A distinction should be made between the two contrary orientations of deduction

and induction. Deductive approaches usually start from an existing theoretical framework, often derived from academic literature, and test hypotheses, for example. This approach is strongly characterized by a structured methodology and a high degree of operationalization and generalization. In an inductive approach, the theory follows the data rather than vice versa. This is particularly appropriate when either little theoretical work has been done or a complex context dominates, making it difficult to reduce the problem to isolated correlations. In between, research approaches of abduction are situated. Here, deductive and inductive elements are deliberately combined (Saunders et al., 2019). The open and explorative design of the research goals formulated in the previous section, the limited knowledge, and the high complexity in this specific research field, suggest a mainly inductive orientation of the research approaches. Nevertheless, a purely inductive approach is rarely possible (Mayring, 2015), so that individual approaches and methods (e. g. the development of category systems within the qualitative analysis processes) inhere deductive elements.

The next three layers describe the research design in a narrower sense. The first choice has to be made concerning the basic orientation of the research method. A division is made between the use of quantitative and/or qualitative data. Given the complexity of humanitarian logistics (Van Wassenhove, 2003), the limited knowledge in the particular research fields, and the open, explorative research questions of this thesis, qualitative-empirical research methods are most suitable for filling the research gaps (Eisenhardt, 1989). The selection of specific research methods is based on the principles of multi-method studies. To answer the first research question (Section 3), a literature review is combined with an interview survey. Research questions 2 and 4 (Sections 4 and 6) will be answered each by a multiple case study. The case study methodology is increasingly applied in logistics and Supply Chain Management (Pedrosa et al., 2012) but remains subordinate to other research methods. According to Leiras et al. (2014) and Chiappetta Jabbour et al. (2019), more empirical evidence is needed in humanitarian logistics. For this reason, case study research designs are particularly recommended (Vega, 2018). For answering the third research question (Section 5), a qualitative content analysis was carried out based on publicly accessible materials of the humanitarian organizations under investigation. With regard to the time horizon, Saunders et al. (2019) distinguish between cross-sectional studies, which consider the object of research at a certain point in time, and longitudinal studies, in which the phenomena under investigation are studied over a certain period. The investigations carried out within the framework of this thesis each reflects the situation

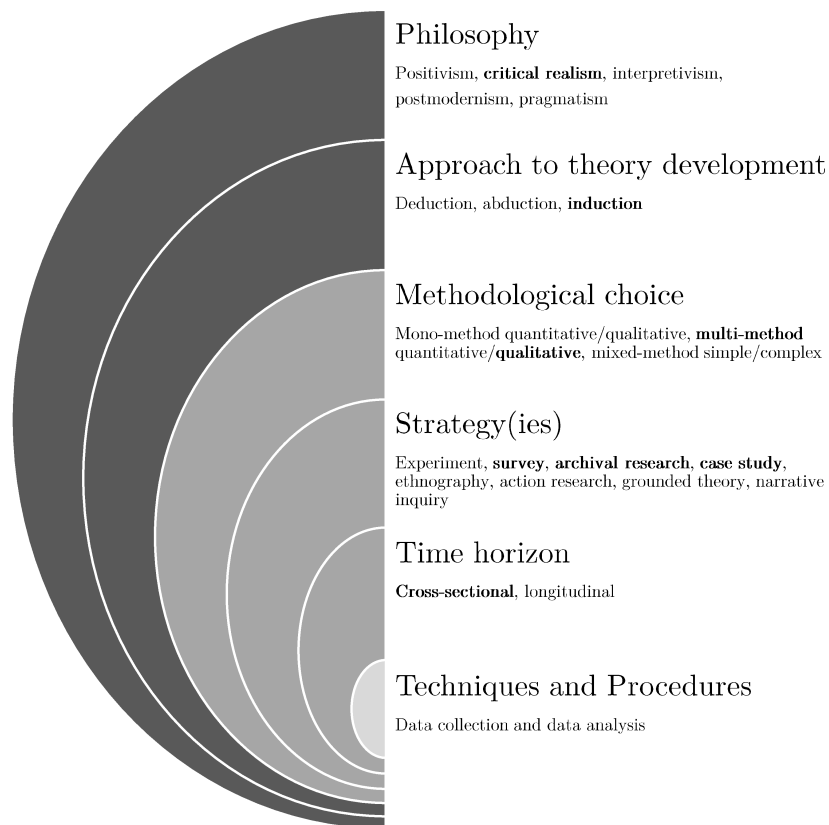


Figure 1.2: Research Onion (Saunders et al., 2019)

at a particular point in time. A classification of the entire research process is illustrated in Figure 1.2 by bold text passages.

The inner layer of the research onion (techniques and procedures) describes the exact methodological configuration of the research, especially the process of data collection and analysis. The two case studies of this thesis are each constructed as multiple case studies, with the first (Section 4) considering six cases and the second (Section 6) ten cases. To collect data, a total of 26 semi-structured interviews, either with scientific experts (Section 3) or with representatives of humanitarian NGOs (Sections 4 and 6), were conducted in English or German language with an average duration of approximately 35 minutes. In addition, scientific literature (Section 3) as well as publicly available (Sections 4-6) and internal material (Sections 4 and 6) of the investigated humanitarian organizations were used as data sources. The exact methodological configuration of the four research parts of this thesis is described in detail in the respective sections of Sections 3-6. This includes, in particular, the case selection of the two case studies, the data collection process and the description of the methods for data analysis.

Qualitative research strategies are particularly exposed to criticism regarding their methodological approach. Therefore, strict adherence to quality standards is of high importance. Stuart et al. (2002) distinguish between external, internal, and construct validity as well as reliability. External validity refers to the generalization of the results. Internal validity refers to making the correct inferences from the data (Ellram, 1996). Construct validity ensures appropriate measures for answering the research questions. Multiple data sources for triangulation, the establishment of a chain of evidence for the reader to follow the research process, and draft reviews by key informants are highlighted (Ellram, 1996). Finally, reliability considers the repeatability of the case study and is related to the traceability of the research, including the documentation of the research process and the data sources (Pedrosa et al., 2012). The compliance with these quality criteria is described in detail in the corresponding sections of the four research parts.

1.4 Structure of the Thesis

This cumulative thesis consists of a total of seven sections, whose content will be briefly introduced below. A summary of the relationships between the individual sections can be found in Figure 1.3. Besides, the detailed research objectives are presented here by referring to the detailed research questions.

This thesis begins with the first section, in which the motivation and scope of the work as well as the research questions and the research design are presented. Section two follows, in which the fundamentals of humanitarian logistics are discussed. This section encloses the following research parts in terms of content by clarifying critical basic principles and concepts which are referred to in the four main sections (Sections 3-6). This includes a basic classification of the concept of disaster, as well as a corresponding classification and an introduction to the concepts of disaster management. In addition, the various actors involved in humanitarian operations are outlined. In particular, the coordination mechanism of the cluster approach will be presented. The basic chapter concludes with a discussion of the specific research area of humanitarian logistics. After an attempt to define and emphasize the importance of logistical activities in relief operations, humanitarian logistics is characterized in contrast to commercial logistics. Finally, the task fields of humanitarian logistics are described.

The Sections 3 to 6 serve to answer the four main research questions outlined above. Each section is based on a research article that has either been published or accepted for publication. The declaration of authorship, including the author's individual contributions, can be found in the appendix of this thesis. The structure of each of these

four research sections follows a rather similar scheme. After an introduction in the first subsection, in which motivation, research goals and research questions, as well as the structure of the section, are explained, a short discussion of the theoretical foundations, which are explicitly crucial for the progress of the work, follows. Subsequently, the methodological procedure of the respective research section is presented. After a section on the presentation of the results and their discussion, the work is summarized in the fifth subsection, and a short outlook is given.

Section 3 can be seen as a preliminary methodological consideration to the two case studies presented in Sections 4 and 6. Using a qualitative multi-method approach (literature review and interview study), the question of which particular challenges in case study research in the context of humanitarian logistics need to be addressed and how these can be overcome was investigated. The research results show that the fundamental challenges of case study design relate to a lack of methodological knowledge. Furthermore, four characteristics of humanitarian logistics can describe specific challenges posed by the particularity of the humanitarian context: the dynamic and volatile environment, the political as well as the international context, and the complexity. To overcome these challenges, recommendations for action were made, which were taken into account in the subsequent case studies.

One of the main arguments for a more intensive consideration of the research field of humanitarian logistics is the high proportion of costs that can be caused by logistical activities in relief operations. In literature, figures of up to 80% are indicated in this connection (Van Wassenhove, 2006; Whiting and Ayala-Öström, 2009; Day et al., 2012). Unfortunately, there are hardly any scientifically based statements about the exact proportion of logistical efforts in humanitarian operations. It, therefore, remains unclear whether the figures given refer to a specific organization or a specific type of disaster. For this reason, the aim of the first multiple case study (**Section 4**) was to provide clarity about the share of logistics in humanitarian operations and the costs incurred. The underlying relationship between the objectives, cooperation and processes of humanitarian actors are of importance in this context. As a result of the work, it became apparent that many context-dependent restrictions prevent general statements. However, it could be confirmed that the costs for logistics in humanitarian operations can reach a maximum of up to 80% of the total project costs - but only under certain circumstances. It could also be shown that a large number of factors influence the logistical activities and thus the costs incurred. These factors depend on the disaster on the one hand, but also the organization and its structure. Two

factors play a major role: the time of deployment and the degree of decentralization. A differentiated view of the actors, therefore, seemed to be very important.

The results of the first case study, as well as the general criticism of the limited practical applicability of research results in the field of humanitarian logistics (Leiras et al., 2014; Kunz et al., 2017), motivated the next research contribution (**Section 5**). One reason for the lack of applicability of research could be seen in the diversity of humanitarian actors. The lack of systematic characterization of humanitarian organizations, especially for the group of NGOs, regarding aspects relevant from a logistical point of view was addressed. The aim of this research contribution was, therefore, to create a systematic overview of these humanitarian actors and to identify influencing factors. Within the framework of a qualitative archival study, 75 humanitarian NGOs were examined and distinguished. As a result, it became apparent that there is a wide variety of different humanitarian organizations, corresponding to a multitude of aspects that determine logistical issues. The four dimensions of mandate and sector, as well as the network structure and forms of cooperation, were identified as the main influencing factors. They can, therefore, be used to classify these humanitarian actors systematically.

The fourth research contribution (**Section 6**) deals with the results of the two previous sections. It specifically examines the organizational structures of humanitarian organizations and the consequent influences on logistical issues. A multiple case study was again conducted as a methodological framework according to the criteria identified in Section 3. For the selection of the cases, it was of particular importance to include organizations with different structures. As a result of this part, four components of networks of humanitarian NGOs have been identified: partner organizations, country offices, associated organizations, and umbrella organizations. Five different relationship structures exist between these components. With these components and their relationship structure, the configuration of humanitarian NGOs' networks can be outlined. Concerning the influences of the organizational structure of an NGO on logistical activities, the discussion revealed that particularly the organizational dimensions of centralization and standardization have a considerable impact.

The work concludes with the seventh section. Here the progress, as well as the results of this cumulative theses, are summarized. Furthermore, the limitations are explained, and a research outlook is ventured.

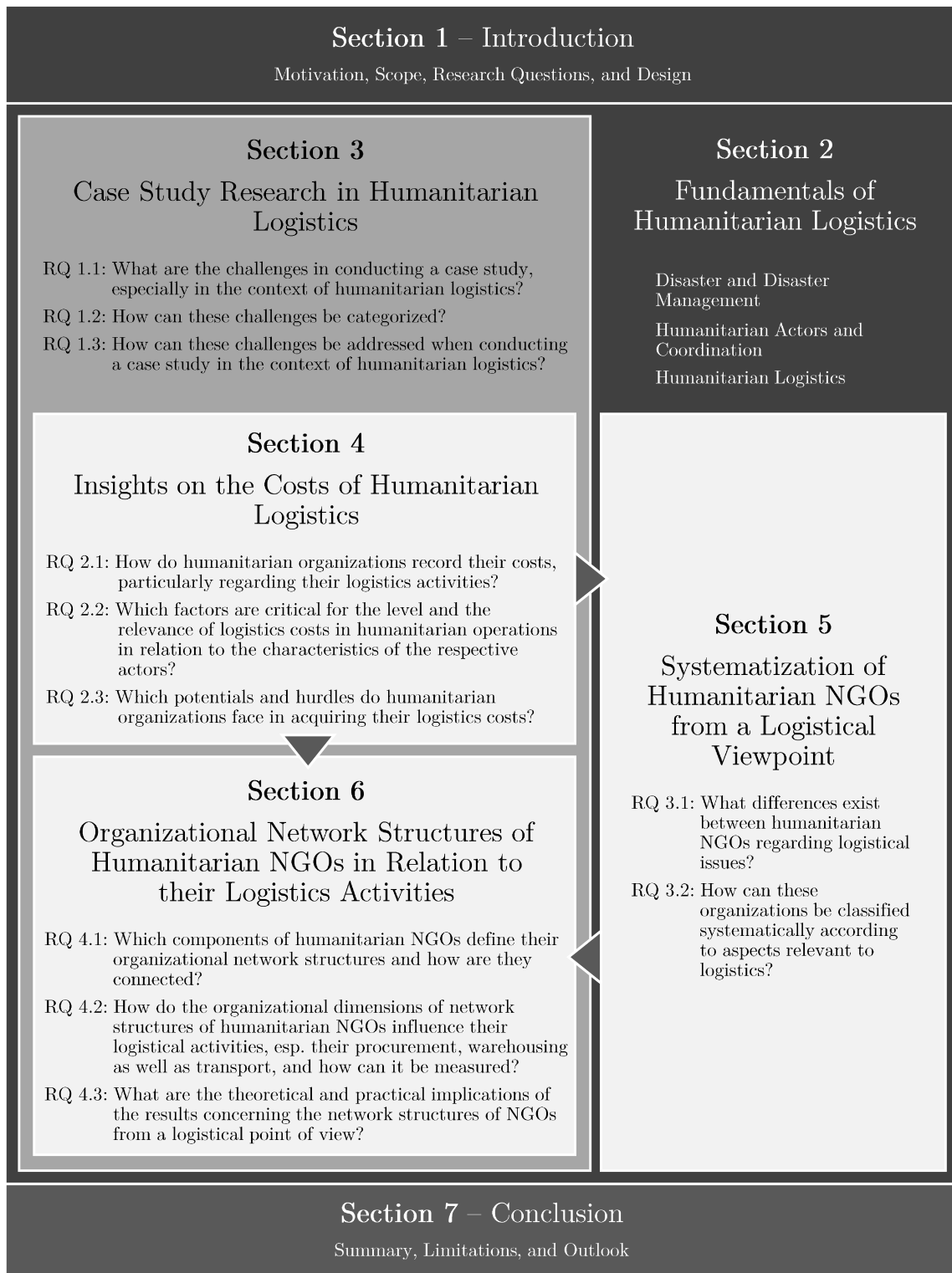


Figure 1.3: Structure of the Thesis

2 Fundamentals of Humanitarian Logistics

2.1 Disasters and Disaster Management

2.1.1 Disasters

The term *disaster* is a frequently used expression in our everyday life. Almost daily, the news report about devastating events and crises. All these tragedies are associated with the terminology of disaster. The increase in the number of natural disasters in recent years can be explained not only by increased public awareness but also by figures, such as those published by the Centre for Research on the Epidemiology of Disasters (CRED). Disasters are often associated with natural or technical events that trigger a disaster, but this comprehension is insufficient. The United Nations International Strategy for Disaster Reduction (UNISDR) defines disasters as

‘a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.’ (UNISDR, 2009)

The decisive element is not the trigger but the severe disruption which exceeds the ability of a community to cope with. Also Schramm and Dries (1986) highlight this circumstance by noting that ‘hazards are agents or trigger mechanisms that can come into contact with a vulnerable human condition to result in a disaster’. The key message is that not the event of a natural or human-made phenomenon or hazard implies a disaster but a combination of them with a community that is vulnerable and not able to cope with that event. The International Federation of Red Cross and Red Crescent Societies (IFRC) describes this circumstance with the following relationship structure that indicates that the greater the vulnerability and the hazard, and the lower the capacity to cope disasters, the higher the severity of a disaster:

$$(\text{Vulnerability} + \text{Hazard}) / \text{Capacity} = \text{Disaster (IFRC, 2020a)}$$

Another way to define disasters is to classify them according to their consequences. The Emergency Database (EM-DAT) CRED and UCLouvain (2020) lists both natural and man-made disasters since 1900. The following criteria have been developed that must be fulfilled for an event or incident to be recorded as a disaster in their database:

- 10 or more people reported killed,
- 100 or more people reported affected,

- Declaration of a state of emergency, or
- Call for international assistance (Guha-Sapir et al., 2016)

Tufinkgi (2004) emphasizes that disasters require unique means and methods of mobilization and organization which distinguish them from routine emergencies. All these definitions have in common that disasters involve significant human or material losses, regardless of where they occur or what they are caused by.

2.1.2 Classification

Classification of disasters seems to be reasonable, as the definitions shown above are all formulated in a rather general way. Such a classification should cover the different dimensions of disasters and consider the various circumstances that disasters imply. As explained above, a disaster depends mainly on two aspects: the specific event which triggers a disaster and the social community affected by that event. The combination of both elements can lead to the devastating effects defined as a disaster.

The event dimension refers to the specific cause or trigger of a disaster. A distinct and frequently used criterion for this is the distinction between natural and man-made disasters (Van Wassenhove, 2006; Eshghi and Larson, 2008). Natural disasters are triggered by natural phenomena such as earthquakes or floods. These disasters are not merely the result of natural hazards; in some instances, humankind can even contribute to their outbreak. This may be the case, for example, with floods in areas with straightened rivers, or for disasters linked to rising sea levels, which can be considered a consequence of climate change. Nevertheless, their occurrence cannot be directly influenced or controlled by humans. Disaster databases such as the Emergency Database (EM-DAT) by CRED and UCLouvain (2020) or the NatCatService database of the reinsurance company Munich Re (2020) specify natural disasters more precisely. Although it is not always possible to assign them accurately to a group, EM-DAT distinguishes the following six groups of natural disasters with their respective main types:

- Geophysical (earthquake, mass movement, volcanic activity),
- Meteorological (extreme temperature, fog, storm),
- Hydrological (flood, landslide, wave action),
- Climatological (drought, glacial lake outburst, wildfire),
- Biological (epidemic, insect infestation, animal accident), and

- Extraterrestrial (impact, space weather) (CRED and UCLouvain, 2020)

Since 2000, natural disasters have claimed more than 1.3 million lives and affected over 4.0 billion people. Additionally, financial damage has been caused, amounting to approximately 2.6 trillion US\$, which is more than the gross domestic product of all individual European countries (except France, Germany, and the United Kingdom) in 2018 (CRED and UCLouvain, 2020; World Bank, 2020). The impact of natural disasters can differ considerably, depending on the type of disaster. In terms of fatalities, earthquakes were the most devastating disasters, accounting for about 54% of all fatalities. Storms are responsible for approximately 15% and extreme temperatures for about 12% of deaths. In terms of the number of people affected by disasters, floods, and droughts account for most of the people affected. The most considerable financial damage was caused by storms (47%), followed by floods (22%) and earthquakes (21%). In summary, earthquakes, storms, floods, and droughts have been the most devastating types of natural disasters in recent times¹.

In contrast to natural disasters, man-made disasters result from hazards that can be controlled or influenced by human beings. The classification of man-made disasters varies much more than those of natural disasters. EM-DAT considers technological disasters, such as industrial or transport accidents, and complex disasters, which can be a combination of natural and man-made disasters, such as famines (CRED and UCLouvain, 2020). At the same time, the GLObal IDEntifier number (GLIDE) project distinguishes between technological disasters, which are similar to the latter, and complex emergencies, such as terrorism, refugee crises, or wars (ADRC, 2020). However, Van Wassenhove (2006) notes that conflict-based disasters do not belong to the category of man-made disasters, as they form a specific class. Conflict-based disasters pose particular challenges for humanitarian actors. The reasons for this are the dangerous situation on the one hand and the impossibility of solving the political component on the other. This can lead to projects resulting from such disasters being larger in scale and longer in duration than humanitarian aid projects following natural disasters. According to UNHCR (2020b), more people are currently fleeing than ever before. The crisis in Syria has forced more than 5.6 million people to leave their country, and a further 6.6 million Syrians are registered as internally displaced people (UNHCR, 2020a).

Each event of disaster has its specific characteristics. On the one hand, there is a period in which the disaster arises. Van Wassenhove (2006) distinguishes between

¹ It should be noted that Covid-19 is not yet included in the EM-DAT. A final consideration of the consequences will only be possible once the Covid-19 pandemic is over.

sudden-onset disasters, e.g. hurricanes or earthquakes, and slow-onset disasters, like droughts or refugee crises. However, within these two groups, the onset time still varies. While almost no lead time can be provided for an earthquake, some storms can be predicted several days in advance. On the other hand, every disaster can be classified according to its severity, which can be measured with measuring instruments. Generally known are, for example, the Richter magnitude scale for earthquakes or the wind speed of storms. Finally, each type of disaster is limited to a specific geographical region. In the *World Risk Report*, the probability of catastrophic events in a particular area or country is referred to as *exposure*. Vanuatu, the South Pacific archipelago hit by a devastating cyclone in 2015, is the country with the world's highest exposure scale for natural disasters, followed by Antigua and Barbuda, and Tonga (Day et al., 2019).

The distinction between the different causes of disasters and their inherent characteristics and regional spread does not yet explain why one event can be extremely devastating while another, even if of the same type and with similar characteristics, can be less severe. It is, therefore, necessary to describe the community affected by the disaster event. According to the definition of the IFRC (2020a), disasters are determined not only by the hazard but also by vulnerability and capacity. Vulnerability describes the reduced ability of individuals or groups of people to cope with or resist disasters. It is often associated with poverty because poverty leads to vulnerable conditions, such as e.g. poor infrastructure and weak building structures (IFRC, 2020b). In the *World Risk Report*, vulnerability is composed of the following three components, including coping capacity:

- Susceptibility (likelihood of suffering harm),
- Coping (capacity to reduce negative consequences), and
- Adaptation (capacities for long-term strategies for social change) (Day et al., 2019)

Finally, a classification of disasters can also be based on the impact or consequences of a particular disaster event that has hit a community. EM-DAT records, on the one hand, the number of people affected (dead, injured, homeless, and affected persons) and, on the other hand, the economic damage (CRED and UCLouvain, 2020). Munich Re divides disasters into five classes on a scale of 0 to 4, depending on their relative financial losses and the number of fatalities. Class 4 disasters are major natural catastrophes requiring international humanitarian assistance and implying catastrophic loss impacts (Munich RE, 2018). In summary, the classification of disasters can be based

on the following two main dimensions: the specific disaster event and the community affected by that event. The interaction of both aspects leads to the effects of a disaster. For the management of disasters and the logistical operations involved, it is essential to understand the underlying context. By recognizing similarities and differences between the different types of disasters, they can be better managed, and assistance can be provided more sufficiently.

2.1.3 Phases of Disaster Management

Disasters and human crises might not be preventable. In particular natural disasters will strike countries and communities, and nothing can be done to avoid them. However, there are indeed possibilities to face disasters to mitigate their impacts and to adapt to a changing environment. Disaster management's purpose is to avoid, to reduce, and to limit human and material losses resulting from disasters (Tufinkgi, 2004). Disaster management, therefore, covers a range of methods and tools to maintain control and to provide help to people who are (potential) affected by disasters. It deals with situations before, during, and after a disaster (Schramm and Hansen, 1986). These different disaster phases are commonly considered in disaster management models. Tufinkgi (2004) distinguishes between three main disaster phases wherein each activity can be classified (figure 2.1). The pre-disaster phase contains activities that relate to potential disasters, without any reference to a specific event of a disaster. It can be subdivided into the main activities of prevention/mitigation and preparedness. Whereas the prevention and mitigation phase implies activities reducing the disaster risk itself, e. g. through a better basic structure of a building against earthquake damage, the preparedness phase concerns the question of how a disaster situation can be coped. These activities are also related to terms like *disaster risk management* or *disaster risk reduction* (GFDRR, 2015). The disaster response begins with the warning phase. In contrast to the previous phase, the activities are now related to a specific event of a disaster with the purpose to warn the public and to take initial action. Depending on the type of disaster, this warning phase can vary between some minutes up to a few days. The emergency response is probably the phase with the greatest public interest. The activities cannot be modeled strictly in sequence; nevertheless, activities and processes of this subphase are among others search and rescue, first aid and emergency assistance, repairs on critical facilities, and temporary provision of food and shelter. The final post-disaster-recovery phase aims a return to a 'new' normality. The subphase of transition and rehabilitation includes activities like the distribution of relief supplies, removal of rubble, makeshift construction of infrastructure and build-

ing, and the reopening of shops. The long-term reconstruction takes place in the final subphase, the objective is the total recovery of the destroyed and damaged structure and the revitalization of the economy and public life (Tufinkgi, 2004). Whereas the sequential phase model is often applied, the recurring character of the phases is highlighted in a disaster cycle model (Carter, 2008). The main disaster activities and their order are similar. However, it is emphasized that the post-disaster phase merges into the pre-disaster phase of the (potential) next event.

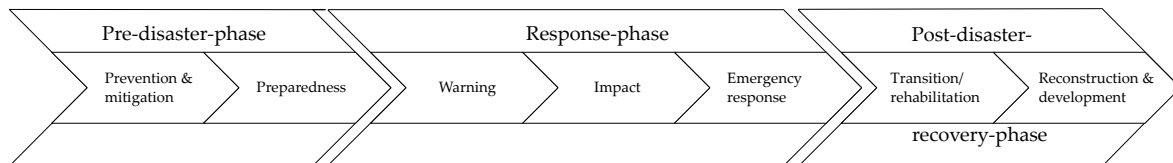


Figure 2.1: Disaster Management Phase Model (Tufinkgi, 2004)

2.2 Humanitarian Actors and their Coordination

A considerable variety of actors are involved in humanitarian operations, regarding financing, coordination, delivering, and reporting humanitarian aid. According to Dijkzeul and Reinhardt (Dijkzeul and Reinhardt, 2013) the international system of humanitarian assistance is not consistent within its objectives, rules, and decision making processes. Instead, it is a low institutionalized system of a growing number of activists and networks which have been developed in the history of humanitarian assistance. However, humanitarian aid has the common goal to ensure the survival of people in need, following the four central humanitarian principles of humanity, impartiality, independence, and neutrality (Kovács and Spens, 2007). Concerning the number of personnel in the humanitarian sector, there has been considerable growth. There has also been a continuous increase in expenditure on humanitarian aid, reaching 27.3 billion US\$ in 2017. The majority of these funds are channeled through UN agencies before then being distributed as grants to the various NGOs (ALNAP, 2018). Seven main key groups of activists, each with subgroups and unique characteristics, have been identified by the Development Initiatives (2015). These humanitarian actors will be briefly introduced, and the coordination between them described in the following.

2.2.1 Humanitarian Actors

Governments

Governments play a crucial role in humanitarian operations as a large part of the funding is provided by them, notably by members of the Development Assistance Com-

mittee (UNDAC), which is part of the Organisation for Economic Cooperation and Development (OECD). However, governments outside UNDAC also provide a significant amount of funding for humanitarian operations. Governments often channel their aid through the United Nations (UN) organizations, non-governmental organizations (NGOs), or the Red Cross and Red Crescent Movement, but also by direct country partnerships (ALNAP, 2018). So (foreign) governments are therefore of great importance in relief operations as they provide the financial means for humanitarian aid. However, national and local governments also play a fundamental role. They are primarily responsible for supporting their populations and coordinating the actors. The international humanitarian network only operates when the situation is overwhelming for the national and local authorities.

International Red Cross and Red Crescent Movement

The Red Cross and Red Crescent Movement include the International Committee of the Red Cross (ICRC) and 192 national societies. The ICRC was founded in 1863 by Jean-Henry Dunant and shaped the principles of humanity, neutrality, and impartiality, which were later adopted mainly in the Geneva Conventions. The national societies form the backbone of the Red Cross and Red Crescent Movement and are united under the umbrella of the International Federation of Red Cross and Red Crescent Societies (IFRC). The IFRC is the largest humanitarian network covering almost all countries of the world and providing extensive assistance in disasters. Within the national Red Cross and Red Crescent Societies, which carry out a number of initiatives in their respective countries, there are various local branches that mobilize millions of volunteers (IFRC, 2020c). To be able to respond efficiently and quickly to disasters, a few national societies can provide so-called Emergency Response Units (ERU). These ERUs contain pre-packaged and standardized equipment and can be deployed by a team of trained technical specialists. The German Red Cross (DRK, 2020), for example, maintains three different ERUs (mobile hospital, mobile health station, and water and hygiene units) and is able to make them available almost anywhere in the world within 72 hours.

Non-Governmental Organizations

The term non-governmental organization (NGO) is a commonly used expression to describe a variety of humanitarian activists. Other terms are also used to describe similar or different organizations, such as civil society organizations (CSO) or faith-based organizations (FBO). It is difficult to determine how many NGOs exist. Estimates range from a few hundred thousand registered organizations up to a million formal

and informal organizations active worldwide (Lewis, 2010). The difficulty is already in delimiting this form of organization. Shortly and concisely, NGOs can be defined as ‘*self-governing, private, not-for-profit organizations that are geared to improving the quality of life of disadvantaged people*’ (Vakil, 1997). This generic definition includes organizations of various sizes, focuses, structures, funding sources, and locations, and thus does not serve to reduce complexity. A distinction is commonly made between Northern and Southern NGOs (Lewis, 2010). NGOs operate at international, national, and local levels, are extremely diverse and involved in all phases of disaster management. The number of international humanitarian NGOs has increased significantly since the early 1990s (Dijkzeul and Reinhardt, 2013). However, there is a wide variety of national and local NGOs that provide humanitarian assistance within their national or regional borders. Although the importance of local organizations is particularly emphasized, only a small proportion of the funds flows directly to them. There is a clear focus on international organizations, which, according to ALNAP (2018), received 94% of total NGO funding in 2017.

Military

Military actors are an increasingly important provider of relief assistance because of their superior logistical capabilities and resources and their ability to respond very quickly to disasters. However, the role of the military within humanitarian operations, especially in conflict-related situations, is a highly controversial issue. In accordance with the humanitarian principle of neutrality, some humanitarian activists avoid partnership with the military (Heaslip et al., 2012). At the national level, the military is often involved in response to natural disasters or other humanitarian crises. In the national context, the military and other security actors are usually a core element of the government’s disaster management plans. At the international level, some countries use their army to respond to natural disasters, thus providing significant support to the work of other humanitarian organizations. In conflict situations, peacekeeping activities aim to create conditions for lasting peace. These operations are often mandated by the UN Security Council and led by multilateral organizations such as the UN, the European Union (EU), or other regional bodies (Dijkzeul and Reinhardt, 2013).

United Nations

Within the United Nations (UN) system there are several programs and specialized agencies with humanitarian mandates. A number of interdependent coordination mechanisms have been set up to ensure good coordination of relief efforts among and be-

tween humanitarian activists. The Inter-Agency Standing Committee² (IASC) is the main forum for coordination and decision-making among key humanitarian activists, including UN agencies and non-UN partners. It is chaired by the Emergency Relief Coordinator (ERC). He or she is the senior UN official who coordinates humanitarian assistance (OCHA, 2018). The ERC is also the head of the Office for the Coordination of Humanitarian Affairs (OCHA). OCHA does not provide aid itself but is the main actor in coordinating effective and principled humanitarian assistance between national and international agencies and organizations. The Food and Agriculture Organization (FAO) was founded in 1945 to achieve food security and raise the level of food and living standards worldwide. The World Health Organization (WHO) is a leader in global health issues and humanitarian aid. The United Nations Relief and Works Agency for Palestine Refugees (UNRWA) was founded in 1949 to provide assistance, protection, and advocacy to Palestinian refugees in the Middle East. Its mandate was repeatedly extended in 2014 as the problem of Palestinian refugees has still not been resolved. The United Nations Children’s Fund (UNICEF) provides children with food, clothing, and medical care. Independent NGOs in 36 countries form the UNICEF network as National Committees. The Office of the United Nations High Commissioner for Refugees (UNHCR) directs and coordinates operations worldwide to protect refugees and solve refugee problems. The World Food Programme (WFP) was founded in 1961 and aimed to reduce hunger in the world. Together with UNHCR, UNICEF, and UNRWA, the WFP provides the largest amount of humanitarian aid within the UN system (Development Initiatives, 2015; ALNAP, 2018).

Community

Communities affected by natural disasters or in crises naturally mobilize resources to respond, including activities such as search and rescue, shelter, food, or provision of physical protection. These domestic activists are often the first to react and can include affected or neighboring communities, government agencies, civil society, or the local private sector. Besides, communities are often supported by migrants and refugees who maintain their links with their community of origin. These diaspora communities frequently support their relatives affected by the disasters (Development Initiatives, 2015).

² The full members of the IASC are FAO, IOM, OCHA, UNDP, UNFPA, UNHABITAT, UNHCR, UNICEF, WFP and WHO; standing invitees are ICRC, ICVA, IFRC, InterAction, OHCHR, SCHR, SR on HR of IDPs and the World Bank (IASC, 2020).

Private and Business Donors

Private donations play an essential role in financing humanitarian aid. According to ALNAP (2018), private donors, including individuals, businesses and corporations, as well as charitable trusts and foundations, are estimated to contribute approximately one-quarter of total humanitarian funding in 2017. However, private donors tend to provide more support in the case of rapidly occurring natural disasters than in the case of slow-onset or conflict-related crises. Besides, companies that contribute their expertise to humanitarian efforts as part of their corporate social responsibility strategy are playing an increasing role.

In Germany, the image of humanitarian aid is shaped by various governmental and non-governmental actors. The German response is characterized by a high proportion of public funds and private donations, especially in the event of sudden-onset major disasters. Unfortunately, however, slow-onset disasters receive less attention here as well, often referred to as *forgotten* crises. In terms of public actors, both the Federal Foreign Office (Auswärtiges Amt, AA) and the Federal Ministry for Economic Cooperation and Development (BMZ) are primarily responsible for international humanitarian assistance and development cooperation. The ministries do not carry out humanitarian projects on their own but cooperate with partners to implement concrete measures. These partners include UN organizations or other international organizations such as the IFRC, but also national partners. The most prominent national partners are the German Society for International Cooperation (GIZ) and the Federal Agency for Technical Relief (THW). In addition, the German government supports national NGOs. The range of German NGOs is broad, with small organizations specializing in certain areas of humanitarian aid and actors who have become global players in their international networks. Several NGOs coordinate their activities under the umbrella of the Association of Development Policy and Humanitarian Aid of German Non-Governmental Organizations (VENRO) (Weingärtner and Otto, 2013). In many other countries around the world, the picture of humanitarian actors is similarly comprehensive and diverse, as in Germany.

2.2.2 Cluster Approach

The cluster approach is probably the most remarkable disaster coordination mechanism in recent years. It was introduced in 2005 within the framework of the Humanitarian Reform Agenda (OCHA, 2018). This cluster approach defines functional areas of activity, known as clusters or sectors, and organizations responsible for each of these

clusters at the global and country level. This approach aims to designate global leadership, build central and local capacities, and ensure the presence of a provider of last resort. The latter should guarantee that at least one organization provides assistance where no other organization takes over the task (Jahre and Jensen, 2010). Eleven areas of activity and their global cluster leaderships have been established (cf. Figure 2.2): logistics (led by WFP), nutrition (UNICEF), emergency shelter (UNHCR and IFRC), camp coordination and camp management (UNHCR and IOM), health (WHO), protection (UNHCR), food security (WFP and FAO), emergency telecommunication (WFP), early recovery (UNDP), education (UNICEF and Save the Children) and water, sanitation and hygiene (UNICEF). Besides, there are four areas of responsibility relating to child protection, gender-based violence, housing, land and property, and mine action (OCHA, 2020c).

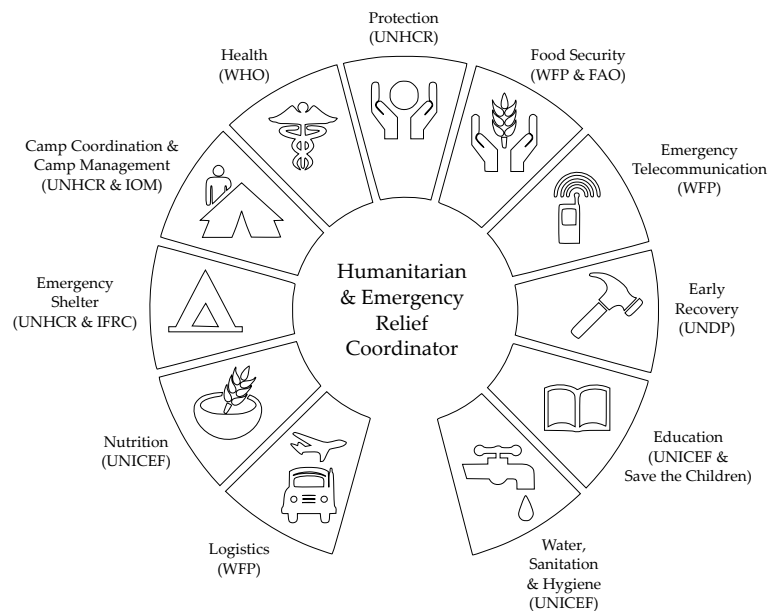


Figure 2.2: UN Cluster Approach (OCHA, 2018)

At the global level, clusters are intended to strengthen system-wide preparedness and coordinate tactical capacities in order to respond quickly to humanitarian disasters in their respective sectors (OCHA, 2012). The development of standards appears to be crucial in humanitarian response, as Sandwell (2011) highlights the lack of common standards for processes, package sizes and data. The cluster approach is expected to be a means to address these challenges by ensuring coordination between the various humanitarian actors. Although Jahre and Jensen (2010) note that coordination within clusters has been successful so far, coordination between different clusters and along supply chains is still limited. On this occasion, new mechanisms for coordination between clusters have been developed in recent years (OCHA, 2020d). In the event of

a specific emergency, clusters have to be activated at country level. In this case, the Resident Coordinator (RC) or the Humanitarian Coordinator (HC) together with the Humanitarian Country Team (HCT) decide which clusters should be activated and select the cluster lead agencies at country level. These agencies serve as the main points of contact for the host country government and the RC/HC. The core functions of clusters at country level are to support service delivery, inform strategic decision-makers and plan strategic development, including advocacy, monitoring, reporting and contingency planning tasks (OCHA, 2020b). The focus is on strengthening coordination and partnership among all actors and thus improving the humanitarian response.

2.3 Humanitarian Logistics

Logistics plays a crucial role in humanitarian operations, as shown in this section. Therefore, the development of humanitarian logistics and its fundamental definitions will be discussed first. The specific characteristics and challenges, especially the differences between commercial and humanitarian logistics, are developed and presented below. Finally, the logistical tasks and their systematization are at the focus of this section.

2.3.1 Definitions and Relevance

The history of logistical thinking and acting, in general, goes back a long time and indeed originates from the ancient world. However, the term *logistics* has its roots in the military of the 19th century, where it described supporting tasks for the armed forces. In the 1950s, the term was adopted by US companies, which increasingly recognized the importance of logistics for their businesses (Bölsche, 2009). Although logistics has been applied successfully in the commercial environment for many years, there is still no uniform definition. In the traditional understanding, logistics primarily comprises material- and goods-related tasks and functions, such as transport, handling, and storage as well as the flow of the related information. The subsystems are procurement, production, distribution, replacement, and reverse logistics (Lasch, 2015). However, the management aspect of logistics as an integrated function in a networked business environment is increasingly focused. In this context, the term supply chain management has become established (Tufinkgi, 2004). Supply Chain Management is thus the generic term that encompasses ‘the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities [...] within and across companies’ (CSCMP, 2020).

Shortly after the emergence of the term *logistics*, the principles of humanitarianism were established. These principles trace back to the Swiss Jean-Henry Dunant, who, in 1859, after the battle of Solferino, took over the care of wounded soldiers from both sides in the battle. This incisive experience led Dunant to express the three principles of humanity, neutrality, and impartiality, which were widely adopted in the Geneva Convention of 1864 and which led to the Red Cross Movement (Gursoy et al., 2010). Since that time, various humanitarian organizations with a wide range of characteristics and emphases have been founded and are still shaping our society today.

A comparatively new aspect is the combination of the two fields *logistics* and *humanitarianism*³ Although logistics has always been involved in humanitarian operations, its status was only recognized in practice and scientific literature at the beginning of the 21st century (Kovács and Spens, 2011). This seems to be overdue since logistics plays a particularly important role in humanitarian operations. Logistics has a considerable influence on the effectiveness of humanitarian operations and determines the speed, coverage, and costs of humanitarian organizations (Baumgarten, 2011). In this context, Van Wassenhove (2006) and Thomas and Mitsuju (2005) highlight that logistics accounts for 80% of the costs and tasks in disaster relief. Furthermore, Thomas and Kopczak (2005) note that logistics and its documentation are crucial for the learning process after disasters. Baumgarten (2011) considers humanitarian logistics as the social responsibility of logistics to reduce human suffering and prevent the death of people. The scope of humanitarian logistics is comprehensive, as it is used as ‘an umbrella term for a mixed array of operations’ (Kovács and Spens, 2007). However, it is critically noted that organizations tend to use the term ‘as a repository for functions that do not fit elsewhere’ (Fritz Institute, 2004). Nevertheless, the definitions of humanitarian logistics resemble those of logistics in general (Bölsche, 2009). The description of Thomas and Kopczak should be the basis of this work; they define humanitarian logistics as

‘the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from the point of origin to the point of consumption for the purpose of alleviating the suffering of vulnerable people’ (Thomas and Kopczak, 2005).

In contrast to commercial logistics, the focus is on reducing human suffering. Baumgarten (2011) recommends that humanitarian logistics should preferably be employed

³ In the context of supply chain management in humanitarian operations, the term of *relief chains* is also used (Beamon and Balciik, 2008).

where people are unable to provide for themselves. In light of this fact, two basic perspectives on humanitarian logistics have emerged: Logistics in continuous relief work and disaster relief logistics (Kovács and Spens, 2007). Humanitarian logistics as continuous relief work thus refers to countries that are not able to provide for themselves and can be regarded as part of development cooperation. In contrast, humanitarian logistics in disaster relief is less restricted to certain regions (Schwarz, 2012). Humanitarian logistics covers a wide range of activities and processes such as preparation, procurement, transport, storage, and training in all phases of a disaster (Thomas and Kopczak, 2005; Kovács and Spens, 2007; Baumgarten, 2011). The requirements on logistics during a disaster can be very different, as the conditions vary greatly depending on the type of disaster and the disaster phase (see Section 2.1).

2.3.2 Characteristics of Humanitarian Logistics

Although commercial and humanitarian logistics are closely linked, there are significant differences that characterize the humanitarian environment and pose particular challenges. The following paragraphs describe these characteristics and challenges and compare them with the corresponding aspects of the commercial sector.

Uncertainty and Urgency

Humanitarian logistics is characterized by a highly volatile and dynamic environment. Since time, place, type, and extent of a disaster are often unpredictable and lead times can be very short or non-existent, humanitarian logistics must be able to deal with these uncertainties (Beamon and Balcik, 2008). The relatively steady flow of goods, which is characterized by repeated activities in the commercial sector, contrasts with a hard-to-realize surge in demand for a once-in-a-lifetime disaster (Holguín-Veras et al., 2012). There are other unknowns in terms of capacities, personnel, process stability, and even the other actors on-site, especially at the beginning of a relief operation (Blecken, 2009). Besides, humanitarian logisticians must work under enormous time pressure. While delays could be accepted in a commercial context, timely response in a humanitarian operation can make the difference between life and death (Van Wassenhove, 2006). A large number of uncertainties and the urgency of the situation, therefore, pose significant challenges for humanitarian logistics.

Objectives and Principles

Another decisive characteristic that influences the activities of humanitarian organizations is internal rather than caused by external circumstances. Not only the conditions

of deployment but also the self-image and objectives of commercial enterprises and humanitarian organizations are fundamentally different. The ultimate goal of humanitarian organizations is to save lives and reduce suffering, while the strategic goal in a business context is to generate financial returns. For the former, finances are seen as constraints rather than goals (Beamon and Balcik, 2008; Nikbakhsh and Zanjirani Farahani, 2011; Kovács and Spens, 2007). This difference has a significant impact on logistic activities. Holguín-Veras et al. (2012) state that in humanitarian logistics, the so-called social costs should be reduced. In contrast to commercial logistics, where externalities are often neglected and only (private) logistics costs are considered, these social costs must include externalities. Finally, a logistical service not provided in a relief operation can lead to loss of life, which could be treated as an externality in the understanding of commercial logistics. In humanitarian logistics, however, this aspect must not be neglected. Therefore externalities must be taken into account⁴. Besides, humanitarian organizations often establish their rigorous principles that determine their activities. They attempt to be sensitive to local cultures (Van Wassenhove and Martinez, 2012) and act in humanity, neutrality, and impartiality.

Beneficiaries, Donors and Other Stakeholders

Relief operations involve a variety of actors with heterogeneous needs and objectives, such as beneficiaries, donors, staff and volunteers, humanitarian agencies and NGOs, governments, and the military (Beamon and Balcik, 2008). Kovács and Spens (2007) distinguish between actors of two main categories. On the one hand, there are local actors with a regional perspective and, on the other hand, international actors with a superregional perspective. They identify the donors as extremely important because they provide most of the funds. In this context, they consider humanitarian agencies and NGOs to be the key actors, because donors, including governments, channel their aid through them. Donors are influenced to a large extent by the media. This can be seen as problematic, as they might see the crisis as a source of profitable business, often leading to a brief focus on quick results (Overstreet et al., 2011). Thus, humanitarian organizations have to deal with complicated ambiguities and orient themselves in a politicized environment (Nikbakhsh and Zanjirani Farahani, 2011).

Another difference between commercial logistics concerns the status of the customer in the supply chain. While in the business context the customer is both end-user (material flow) and buyer (financial flow), the end-user in the relief chain is not equal to the buyer (Figure 2.3), which leads to a supply chain from the buyer (donor) to the

⁴ This is why Holguín-Veras et al. (2012) argue that models of commercial logistics are only partially applicable in the humanitarian context.

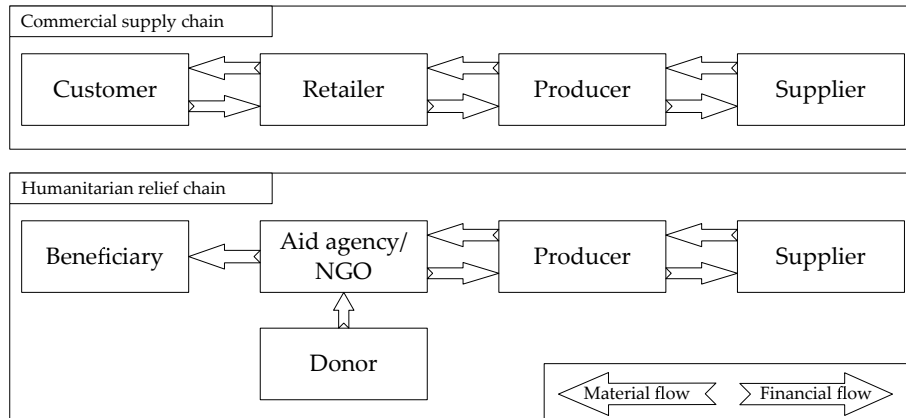


Figure 2.3: Comparison of Commercial Supply Chain and Humanitarian Relief Chain (Schwarz, 2012)

end-user (beneficiary) (Charles and Lauras, 2011). This fact poses some difficulties. Demand is not generated by the customer as in a commercial context but has to be estimated, which implies uncertainties (Beamon and Balcik, 2008). Moreover, the beneficiaries do not have a real choice of market. This does not seem to be decisive at first. However, Nikbakhsh and Farahani (2011) note that inefficient organizations cannot be penalized because of the lack of the beneficiaries' voice. This has the negative effect that it can lead to a large number of useless donations in kind (Holguín-Veras et al., 2012), which is a significant problem in the relief chain because it blocks limited storage spaces.

Infrastructure and Capabilities

Disaster situations are highly complex and chaotic. Damaged infrastructure may block access to regions or people in need. Moreover, the infrastructure can be exposed to seasonal conditions. For example, some roads can be impassable during the rainy season. In addition, transport and storage capacities may be damaged, and a general lack of equipment and resources may prevail (Keßler, 2012). Another enormous challenge concerns communication and information infrastructure, which is already lacking under normal circumstances, especially in developing countries. Nevertheless, supply chains are becoming increasingly dependent on information (Oloruntoba and Gray, 2006), making the corresponding infrastructure crucial for disaster management. It is also important to note that humanitarian agencies and NGOs often lack skills (e. g. in communication and information) themselves, as donors tend to provide money for immediate relief but not for capacity building (Beamon and Balcik, 2008; Van Wassenhove and Martinez, 2012). In this context, human resource capacity needs to be highlighted, as there is often a lack of logistical expertise and career paths (Sandwell, 2011). Kovács,

Tatham, and Larson (2012) noted that in addition to the functional skills of traditional logistics training, some specific skills are required in a humanitarian context. These contextual skills may include fleet management and communication systems management, and skills related to the design and implementation of logistics policies. Besides, technical aspects and logistics management play a particularly important role in humanitarian logistics.

Coordination and Cooperation

Relief operations are characterized by a large number of humanitarian actors. During the Indian Ocean tsunami in 2004, more than 700 NGOs from over 40 countries were involved (Chia, 2007). Since most of them operate in independent supply chains and have their financial resources and systems, coordination is indeed a major challenge (Jahre and Jensen, 2010; Nikbakhsh and Zanjirani Farahani, 2011; Chandes and Paché, 2010). The lack of information and cooperation creates highly dynamic, informal, and often improvised decision-making structures in contrast to the commercial sector, which is characterized by formal structures, standardized procedures, and clearly defined roles and responsibilities (Holguín-Veras et al., 2012). Nevertheless, Schulz and Blecken (2010) identified that the same potential benefits of cooperation could be realized in the humanitarian sector as in the private sector, such as cost reduction and concentration on core competencies. Balcik et al. (2010) note that some cooperation efforts have already been made, especially those mechanisms with the most significant potential for implementation (e. g., joint procurement and third-party warehousing). Joint logistics activities and partnerships between private sector companies and humanitarian organizations are also increasing. However, several obstacles remain that hinder the willingness to cooperate, such as cultural differences, insufficient capacities, lack of transparency, and the perception of logistics as one of the organization's core competencies. Cooperation in the preparatory phase of a disaster is also limited (Schulz and Blecken, 2010). It should further be mentioned that there are additional difficulties in partnerships between NGOs and the military due to the NGOs' policies of humanity, independence, and neutrality. An example can be given after the earthquake in Pakistan in 2005, where the IFRC rented its aircraft, although 100 mainly military helicopters were on-site (Heaslip et al., 2012).

Dependencies of Characteristics

All the above-mentioned characteristics and challenges of humanitarian logistics do not stand on their own but are interdependent. They can vary considerably in scope depending on the circumstances. One and the same trigger of a disaster can

have very different effects in different regions (cf. Section 2.1.3). Furthermore, the stage of a humanitarian operation is of crucial significance. The phase immediately after the onset of a disaster is far more complex and confusing than the later phases. In this context, Holguín-Veras et al. (2012) distinguish between regular humanitarian logistics and humanitarian logistics after disasters, which reminds of the two streams of humanitarian logistics in general (see above). They argue that regular humanitarian logistics is in the middle between commercial logistics and post-disaster humanitarian logistics and therefore its characteristics sometimes resemble the former or the latter. Other external factors also influence the logistical activities in humanitarian aid operations. According to Kovács and Spens (2009), the challenges of humanitarian logistics can be associated with different types of disasters, with the phases of disaster relief and with different types of humanitarian organizations.

In summary, the challenges arising from humanitarian operations are related to various areas, such as infrastructure, insecurity, and coordination, which distinguish humanitarian logistics from commercial ones. Nevertheless, there do also exist similarities (Beamon and Balcik, 2008). This fact creates the possibility of cross-learning effects so that both sides can learn from each other (Keßler, 2012). Efforts should be made both to identify these differences and similarities with their inherent dependencies and to obtain appropriate methods and processes to achieve best practices in humanitarian logistics.

2.3.3 Humanitarian Logistics Tasks

Under the special conditions of disaster situations as described above, the main objective of humanitarian logistics is to support people in need and thus provide them with all the goods they need to live. According to Bölsche (2009) these supplies can be divided into three groups: firstly, relief goods that are directly provided to the people affected, such as water, food, medicines, clothing, blankets, and shelter. Secondly, supplies for capacity building, such as equipment and facilities for refugee camps or field hospitals, and thirdly, supplies for logistical infrastructure. These logistical infrastructure items may be materials needed to build camps or storage areas, or the transport vehicles themselves. Human resources are of particular importance, as they are essential for the fulfillment of the logistical task. The classification of the various logistical objects is particularly useful because the packaging and transport requirements, as well as the urgency of the need and the quantity required, can vary considerably during disaster relief. To facilitate the identification of relief items and to support the sorting and

registration process, the WHO has adopted a standard classification of humanitarian relief supplies in the ten categories (PAHO, 2001).

There is some controversy about the exact assignment of tasks to humanitarian logistics. Bölsche (2009) describes the two core tasks of transportation and warehousing and additionally the task of picking and packing as well as information management. Beamon and Balcik (2008) distinguish between the fundamental processes of evaluation, procurement, and shipping. Balcik et al. (2010) classify the three main phases of acquisition/procurement, pre-positioning/warehousing, and transportation. Regarding the whole relief chain, the individual tasks and their relationships become clearer. Hellingrath and Widera (2011) developed a process-oriented relief chain to describe the flow of relief items within this chain. At the beginning of the chain, the supplies must be procured and then stored in the country of origin. This is followed by the task of transportation to and storage at the point of entry. Finally, the distribution must be carried out on the last mile. Besides, other tasks such as human resource management, information services, and assessment accompany the supply chain. Balcik et al. (2010) also describe the relief chain, but take a broader approach, as they additionally distinguish between supply flows before and after a disaster. Their schematic description makes it possible to precisely assign the individual processes within this relief chain (Figure 2.4). The main processes here are, as already mentioned, supply acquisition/procurement, pre-positioning/warehousing, and transportation. In the pre-disaster phase, the supply flow arises from the suppliers and the in-kind donation and ends in pre-positioning distribution centers or points. Whereas in the post-disaster phase, the supplies flow from the suppliers or donors and the distribution centers or points to all downstream stages. A similar approach is used by Bölsche (2009) as she assigns specific tasks within the phase model of disaster management.

To visualize tasks of relief chain management and humanitarian logistics and to contribute to the standardization of terms, definitions, and activities, Blecken (2009) developed a reference task model for the supply chain processes in humanitarian organizations. It describes two dimensions, hierarchical and structural decomposition, as shown in Figure 2.5. The hierarchical decomposition dimension differs between a strategic, tactical, and operational level. The tasks of the strategic level include those related to relief chain design and cover a time horizon of more than two years. The tactical level covers a time horizon between six months and two years and comprises tasks that are necessary to optimize an organization or a relief chain. The allocation of resources and the implementation of decisions belong to the operational level, which covers a time horizon of up to six months. On the other hand, within the dimension

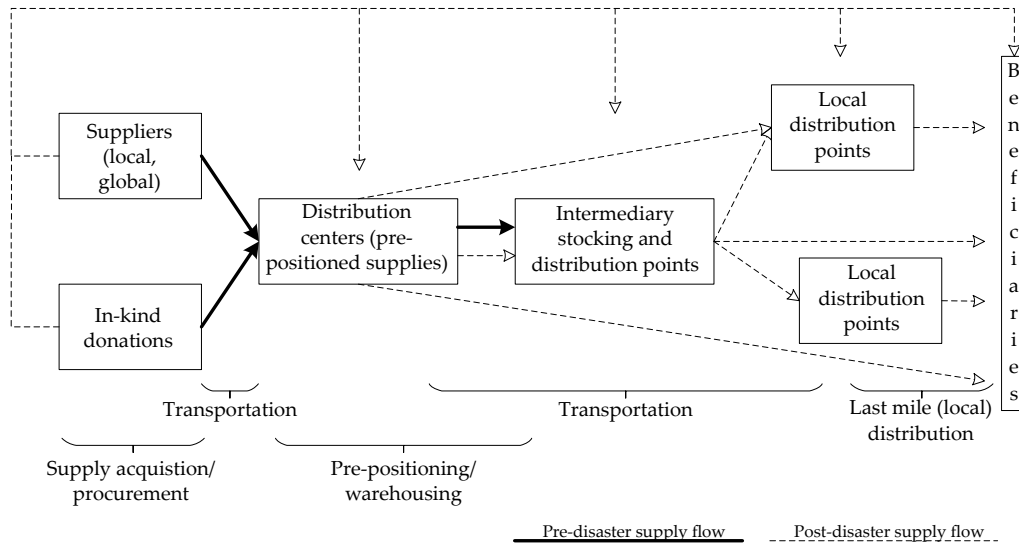


Figure 2.4: Relief Chain Structure (Balcik et al., 2010)

of structural decomposition, a distinction is made between valuation, procurement, storage, and transportation. Assessment is necessary to identify the people affected or the needs of the community. Procurement ensures that a humanitarian organization has all the required material resources. Warehousing tasks are related to the storage and handling of relief items; transport includes all distribution tasks. Finally, vertical and horizontal cross-section functions accompany these tasks: reporting along with the three levels and supporting operations along with the other five processes. Each intersection of hierarchical and structural decomposition involves a specific set of precise tasks.

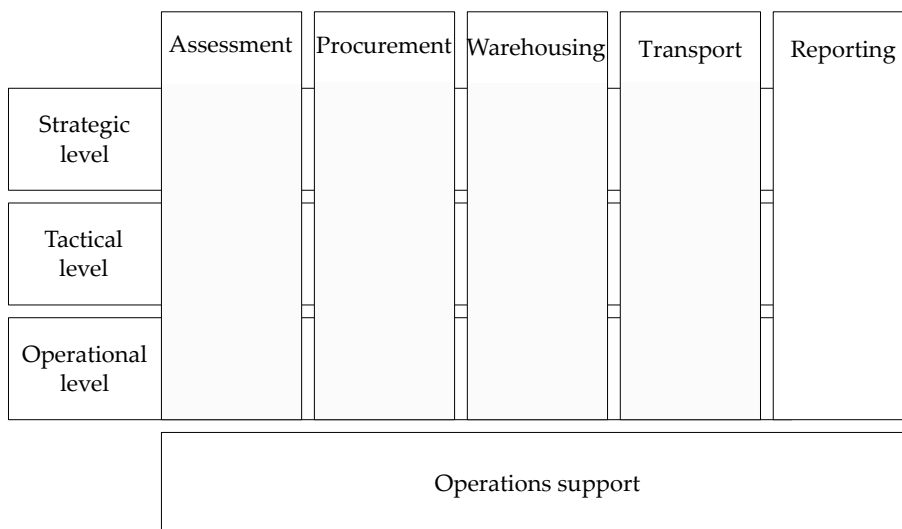


Figure 2.5: Reference Model Framework (Blecken, 2009)

3 Case Study Research in Humanitarian Logistics: Challenges and Recommendations for Action

Abstract

Providing help to people in need is the responsibility of society and does not exclude logistical issues. Especially in this area of logistics research, a strong practical orientation is of great importance. Case study research is often seen as a suitable instrument to bridge the gap between research and practice and is therefore particularly recommended. However, since the contextual influences in humanitarian operations are very diverse, this research method is exposed to specific challenges. There is a lack of a systematic consideration of these challenges and a comprehensive guideline for researchers. Therefore, this paper aims at systematically identifying and categorizing the challenges in conducting case study research in the context of humanitarian logistics. Practical recommendations for the application of this research method will be developed to overcome these obstacles. To achieve the research objectives, a multi-method approach was chosen. First, a systematic literature review was carried out. In addition, six interviews with experts were conducted, all of whom have extensive experience in the field of case study research in the context of humanitarian logistics. The recommendations for action are based on a qualitative and deductive methodology. The results of the study show that four characteristics of humanitarian logistics represent unique challenges for case study research and must therefore be considered particularly: the dynamic environment, the political as well as the international context, and the general complexity.

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4 Insights on the Costs of Humanitarian Logistics: A Case Study Analysis

Abstract

The aim of this paper is to investigate how humanitarian organizations keep track of their logistics costs. Furthermore, first insights regarding the extent of logistics costs in humanitarian operations are provided and the underlying relationships with the objectives, the forms of cooperation, and the processes of the humanitarian actors are examined. In order to answer the research questions, a qualitative case study with expert interviews in six humanitarian organizations is applied. The results show that the recording of logistics costs in practice is rather limited. The figures given in the literature are only realistic under certain circumstances – in some cases costs can be much lower. The degree of project autonomy and the disaster phase are shown to have the greatest impacts. This work provides first insights into the logistics costs based mainly on the investigation into six German organizations and, hence, is limited in its generalizability. However, since little empirical data and few scientific contributions are available in this context, the paper provides more specific evidence of the actual level of logistics costs and the underlying dependencies.

5 Systematization of Humanitarian NGOs from a Logistical Viewpoint: An Exploratory Study in Germany

Abstract

Logistics is an important factor in humanitarian aid operations, whether after the outbreak of a natural disaster or during manmade crises. The speed and effectiveness of the various actors depend, among other things, on the appropriate design of the operations, which is why the scientific interest in this field has increased considerably in recent years. Unfortunately, there is a gap between science and practice (Kunz et al., 2017). One reason for the lack of applicability in humanitarian logistics research can be seen in the diversity of humanitarian actors. As there is no systematic characterization of humanitarian NGOs regarding aspects relevant from a logistical perspective, this paper aims at providing a suitable overview. A classification scheme is developed that includes the four dimensions of the mandate and sector, as well as the internal network structure and the various forms of on-site cooperation. The results can help to better align scientific research in humanitarian logistics and to foster practical exchange between the pertinent humanitarian organizations.

6 Organizational Network Structures of Humanitarian Non-Governmental Organizations in Relation to their Logistics Activities

Abstract

This work aims at conducting a comprehensive investigation of network structures of humanitarian organizations and elaborating the resulting influences on their logistical activities. This is the first work that connects the organizational structures of humanitarian organizations with logistical aspects. Organizational components and their relationships, as well as influencing factors, are identified, and essential scientific and practical implications derived. For this purpose, a multiple case study based on ten humanitarian non-governmental organizations (NGOs) was conducted. Interviews and surveys, as well as publicly available and internal documents of the organizations, served as research material. In this case study, four components of networks were identified, and their interrelationships described. The logistical influences were consequently analyzed. It is shown that the dimensions of formalization, centralization, and standardization in humanitarian organizational networks have an impact on logistics activities. This paper further provides theoretical and practical implications.

7 Conclusion

7.1 Summary

Although the research field of humanitarian logistics has received increasing attention, especially since the last 15 years, there are still many open research questions. The significant uncertainties associated with disasters, the enormous time pressure, the often political context and the high degree of complexity pose major challenges, especially for logistical activities. A large number of very diverse actors, some of whom must work together on an ad hoc basis, also poses difficulties. This thesis, therefore, primarily aims at empirically investigating the logistical activities of the actors of humanitarian operations, in particular the group of NGOs, to identify connections and influences and thus enable a better classification. From a theoretical point of view, the results of the thesis can contribute to the development of more specific and appropriate approaches or solutions. The classification of NGOs from a logistical point of view contributes to a deeper understanding and enables the development of new concepts, e. g. concerning cooperation. From a practical point of view, some implications arise, such as partnership models. The methodological approach of this work is to be classified as inductive and qualitative multi-methodological in accordance with the open research goal, the lack of specific theoretical preliminary work and the complexity of the subject under investigation. In particular, the research strategies survey, archival research and case study were applied. These are suitable for answering the research questions as well in that according to Leiras et al. (2014) and Chiappetta Jabbour et al. (2019) more empirical evidence in humanitarian logistics is required.

The thesis begins with a motivation for the topic as well as a description of the scope and the methodological instruments for answering the research questions posed in Section 1. Subsequently, the theoretical foundations relevant for the progress of the work are laid (Section 2). In particular, a classification of the different types of disasters and a formulation of the phases of disaster management are undertaken. In addition, the various actors in humanitarian assistance and the instruments for coordination are presented. Besides, humanitarian logistics is embedded in theory. In addition to the definition, the main differences to commercial logistics are used for characterization, and the basic logistics tasks are presented.

In the first research part of this thesis (Section 3), the aim was to find out which particular challenges for the research strategy of the case study arise in the context of humanitarian logistics. For this purpose, a literature review, as well as six expert interviews, were conducted and qualitatively evaluated. The results showed that the

fundamental challenges of the case study research are related to a lack of methodological knowledge, which exists on the macro as well as on the micro-level. Additionally, four characteristics of humanitarian logistics were identified, causing specific challenges: The dynamic and volatile environment is the first factor contributing to difficulties. Furthermore, both the political and international context must be considered. Finally, the high degree of complexity causes unique challenges in case study research in the context of humanitarian logistics. Recommendations for action could be made regarding adherence to methodological rigor throughout the research process, such as building a network, working with local actors and researchers, formulating target-group specific questions, applying a triangulation strategy, understanding the methods used to structure complex data sets, obtaining advice from fellow researchers, and using mixed methods.

The second central part of this thesis (Section 4) aimed to examine the actual scope and corresponding costs of logistics in humanitarian organizations and the underlying interdependencies. As a methodological strategy, a mixed approach was chosen from a comprehensive analysis of scientific and practical literature and a multiple case study in six humanitarian organizations. The evaluation of the work revealed that there is limited information in the literature on the exact level of logistics costs in humanitarian operations, including a lack of contextual information. Also, for the organizations examined in the case study, a variety of contextual limitations prevent general statements from being made. However, it could be confirmed that costs for logistics can reach a maximum of up to 80% of total project costs. However, this is only true for some organizations and under certain circumstances. It became clear that a differentiated consideration is essential because a multitude of factors influence logistical activities and thus, the costs incurred. These factors depend on the disaster itself but also the organization and its structure. Two factors are crucial: the time of deployment and the degree of decentralization. In the second part of the research, the potential and obstacles of logistics cost accounting in humanitarian organizations were identified. The most important motives are increasing transparency and the possibility of process improvement. Obstacles arise from the limited benefits of such separate cost accounting as well as from difficulties in the practical implementation, such as a different understanding of terminology. To overcome these obstacles, a process model for the introduction of logistics cost accounting in a humanitarian context was developed.

Motivated by the results of the previous research and the necessity of a more in-depth examination of the individual actors in humanitarian operations, the third part (Section 5) should give a general overview of the humanitarian NGOs in Germany,

which contains criteria relevant for logistical activities. Besides, a classification scheme for systematizing these organizations was to develop. For this purpose, an archival study was conducted examining publicly accessible data from 75 German humanitarian organizations. It was shown that there is a considerable variety of different humanitarian organizations. Some aspects of this diversity concern logistical issues, such as the general orientation of an organization's work, its size, and the budget or the international structure of the network. The four dimensions of the mandate and the sector, as well as the network structure, and the forms of cooperation, were identified as the main factors influencing this diversity and were used to classify humanitarian actors systematically.

Since it became clear in the two previous research parts of the work that the network structure of humanitarian organizations can have a decisive influence on their logistical activities, this was to be investigated more precisely in the last research part (Section 6). Again, a multiple case study was chosen as the methodological framework. The systematic selection of the cases corresponded to ten German humanitarian organizations that were examined. As a result, four components of networks of humanitarian NGOs could be identified (partner organizations, country offices, associated organizations, and umbrella organizations), between which in turn five different relationship structures exist. These components and their relationship structures serve to describe the configuration of networks of humanitarian NGOs. Regarding the influence of the organizational structure on logistical activities, it could be shown that the organizational dimensions of centralization and standardization have an impact in particular.

7.2 Limitations

General limitations of this thesis arise with regard to the underlying methodological choices and the selection of specific research strategies in the individual research sections. Qualitative research is usually subject to a critical evaluation, which can only be countered by methodological rigor and the observance of specific quality criteria. Despite careful consideration of the method, a distortion of the results due to the subjective interpretation of the data cannot be excluded. Therefore, in the individual research sections, the emphasis was placed on providing detailed justification for the appropriateness of the methodological instruments applied. In addition, the methodological approach was presented in detail and transparently in the relevant paragraphs of this work. The results of this thesis are partly based on publicly available information from the humanitarian organizations investigated. This material was not always available to the same extent and of the same quality for all units investigated. Furthermore,

due to the high complexity and diversity of humanitarian logistics, the completeness of the research results cannot be guaranteed.

This thesis is to a large part (Sections 4 to 6) restricted to the investigation of the group of Non-Governmental Organizations. A justification for this is given in the corresponding paragraphs of the individual sections. It can be summarized to the point that NGOs are amongst the most important actors in humanitarian operations, and in addition, are particularly divergent and underrepresented in research. Nevertheless, there are other groups of actors that are no less important and are even more likely to be the subject of scientific research (Chiappetta Jabbour et al., 2019). Depending on what measure is consulted (e. g. size of available budget), the intergovernmental UN organizations and the Red Cross and Red Crescent Movement should be referred to in particular. An investigation of these actors, also regarding similar aspects as in this thesis, as well as a comparison of the results between these groups of actors, is therefore explicitly recommended. Particularly regarding (international) networks of humanitarian organizations, the limitation to the investigation of exclusively German representatives should be referred to. A justification for this is given at the corresponding paragraphs in this thesis and is summarized to the effect that this should ensure improved comparability. In this way, it was possible to neglect country-specific (e. g. legal) or to a certain extent, cultural influences in the evaluation. Nevertheless, this is a limitation of the results. A transfer should, however, also be made to other organizations. Further investigations should take up this limitation (cf. Section 7.3).

Finally, it should be noted that this work will by no means close the gap between theory and practice. It is itself rather theoretical in nature. However, it attempts to a certain extent to create conditions that will make research more relevant to practice. Precise description and strong differentiation of the characteristics of the actors of humanitarian operations can also enable a more appropriate development of approaches to solutions.

7.3 Outlook

This thesis represents only a partial step in the classification of humanitarian organizations from a logistical point of view. Further research is necessary for various points of view. In general, it can be summarized that additional effort is needed to validate the results obtained. It is certainly also due to the choice of methodological strategies that a generalization of the results is not possible, which is why quantitative methods, in particular, could be used to verify correlations on a broader basis and to formulate influential factors more accurately. This would also make it possible to characterize

more precisely the individual dimensions in which the actors in humanitarian relief differ.

Moreover, there are several ways to address further issues raised by this work. During the investigations, it became apparent that specific characteristics of NGOs have a decisive influence on their logistical activities. More detailed research was carried out regarding network structures, but other dimensions could also be analyzed in more depth. In particular, the mandate of an organization in relation to its specific orientation towards acute disaster relief or long-term development cooperation, as well as the specific humanitarian sector in which the organization is active, should be addressed here. A sound selection of units under investigation, for example, in the context of a case study, could expand the relevant findings. A more precise systematization of humanitarian actors could be further helpful for research on the design of cooperation in humanitarian logistics. Such a classification of similar organizations in terms of their logistics structure is also useful from a practical perspective. Cooperation or even benchmarks could thus be implemented in a more targeted manner.

Investigations with respect to the network structure of humanitarian organizations can be expanded in different aspects. The results, especially concerning the network components, can be used as a starting point to examine systematically and on a larger scale, e. g. with quantitative measures, the formalization of the organizational structures of NGOs. A more detailed examination of the relationships between these components may also be necessary. Furthermore, the reasons for the formation of individual components in networks of humanitarian organizations could be investigated. This could be done in analogy to the motives for cooperation in the commercial sector (cost, price, quality, and flexibility). Such an investigation could also remove the restriction to German NGOs. A systematic investigation of the relationships between different networks is also conceivable.

As already mentioned in the previous section, the investigations within the framework of this thesis are largely limited to the group of NGOs. Here, it would be useful to extend the research to other groups, especially UN agencies and the Red Cross and Red Crescent Movement. On the one hand, an analysis based on similar dimensions to those raised in this work could be made. On the other hand, a comparison of the different groups of actors is recommended, since ultimately the organizations of these groups also cooperate in humanitarian aid missions.

In conclusion, it should be noted that it is in the interest of this thesis as well as generally in the research field of humanitarian logistics to carry out practice-oriented research. It is a matter of keeping an eye on the practical work of humanitarian organi-

zations and supporting their efforts. For this reason, cooperation with and orientation of the research line towards these partners in practice is thus meaningful. In this way, it may be possible to improve humanitarian relief and ultimately to support people in need more effectively and, if possible, more efficiently.

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