INFORMATION FLOW IN HUMANITARIAN RELIEF OPERATIONS

INTERVIEWS AND A CASE STUDY INCLUDING PROCESS MAPPING AND THE DEVELOPMENT OF PRACTICAL RECOMMENDATIONS IN A BOOKLET.

Master Thesis

Author:
Andrea Rominger
Im Höfli 8
8307 Effretikon
S10304525

Main Advisor:
Prof. Dr. Alfred Angerer (ZHAW)

External Co-Advisor:
Bublu Sarbani Thakur-Weigold (ETH)

Degree Program:
MSc Business Administration,
Major Nonprofit and Public Management, FS17

Winterthur, 26. June 2017

Paper was composed at the School of Management and Law,
Zürich School of Applied Sciences ZHAW

«A child is far more compelling than a satellite phone, but a well-placed satellite phone can help reduce the suffering of many children.»

Haselkorn, 2005, in: Maiers et al., 2005, p. 86

Management Summary

Emergency relief is an industry focusing on rapid life-saving assistance. The environment is complex, the context fragile and rapidly changing circumstances cause operations to be unpredictable. 80 percent of all funds are spent on logistics, out of which 40 percent are wasted. Increasing efficiency of humanitarian operations makes more resources available to directly address humanitarian needs and strengthens accountability to donors. The hypothesis is that, detecting and addressing impediments in communication processes increases the efficiency of humanitarian operations as information flow (IF) determines material flow. Therefore, this thesis asks which impediments to IF exist, elaborates several ideas for improvement of these processes and seeks to make the findings available in a handy format for practitioners.

The research is done based on the data collected of the exchanges with 13 relief experts working for five International Humanitarian Organisations (IHO) and the humanitarian department of a governmental organisation. Three research methods were applied: interviews, a questionnaire and a process mapping. The context of emergency relief was explored through four interviews. A *clear definition of roles and responsibilities* and *clear lines of communication* were identified as important factors influencing information flow. The impediments experienced in practice were gathered through a questionnaire filled in by ten relief experts. *High staff turnover* turns out to be the most frequently experienced obstacle. The process mapping analysed as a case study the humanitarian response of the IHO Medair to Hurricane Matthew in Haiti in October 2016. 13 impediments could be identified, whereas the majority experienced in practice is congruent with the ones identified by the literature. Discussions with the emergency response team during, and with process experts after the mapping served to formulate concrete recommendations to address these impediments. The recommendations were categorized with the help of Rosenstiel's theoretical model conditions of behaviour and three recommendations were then elaborated in detail: *Standardised forms, clear lines of communication* and *modification with explanatory statement.* Recommendations and interview results are then translated into a booklet with practical tips to improve information flow in emergency relief operations.

The thesis confirms the hypothesis: process improvement advances information flow and increases the efficiency of humanitarian operations. The recommendations to improve IF point at two approaches: technical and behavioural communication skills trainings for staff improve IF and management facilitates IF by inducing change through regulations. The findings are a considerable gain, pointing out specific areas of intervention to improve information flows and thereby efficiency in emergency relief operations. Future research may test the impact of IF on performance, develop the concept of good organisational performance in an IHO and test the influence of the strategic position of logistics within the IHO on performance.

Table of content

List of Figures

List of Tables

Abbreviations

ERT	Emergency Response Team
ER	Emergency Relief
ERO	Emergency Relief Operation
FO	Field Office
GO	Governmental Organisation
HQ	Headquarters
IF	Information Flow
IHO	International Humanitarian Organisation
IM	Information Management
INGO	International Non-Governmental Organisation
IS	Information Sharing
IT	Information Technologies
NGO	Non-governmental Organisation
QIP	Quick Impact Project
SCM	Supply Chain Management
SHA	Swiss Humanitarian Aid Unit
TL	Team leader
UN	United Nations
UNHCR	United Nations High Commissioner for Refugees
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
WASH	Water, Sanitation and Hygiene

1 Introduction

When Hurricane Matthew violently struck Haiti on October 4th (2016), it resulted in the country's worst humanitarian emergency since the earthquake in 2010 (Reliefweb, 2016). Matthew's storm surge caused considerable wave action, coastal inundation, mudslides, water shortages and damage to road infrastructure and buildings (Stewart, 2017; Reliefweb, 2016). The United Nations (UN) and the government estimated 1.4 million people to be in need of humanitarian help. The UN define an emergency as a "sudden and usually unforeseen event that calls for immediate measures to minimize its adverse consequences" (Reliefweb, 2008, p. 24).

1.1 Research Problem

In the case of an emergency, humanitarian actors distribute relief items to cover the urgent needs of those affected by conflict or disaster. Research indicates that logistic teams from International Humanitarian Organisations (IHO) spend 80 percent of all funds to purchase the goods (Thakur-Weigold, Stumpf & Wagner, 2015, p. 25). Furthermore, it is estimated that a shattering 40 percent of this part is ultimately wasted (Day, Melnyk, Larson, Davis and Whybark, 2012, p. 27). These inefficiencies limit the funding available for direct project costs addressing the humanitarian needs. Poor information flow, inadequate coordination efforts and conflicting internal procedures are identified as factors limiting effective operations (Reindorp & Wiles, 2001, p. 8). A decade ago, Van Wassenhove (2006, p. 477) states that there is little incentive to improve performance based on lessons learned in emergencies. Since then however, the humanitarian community realised the importance of efficiency. The Grand Bargain emanated as an important result from the first world humanitarian summit in 2017:

> *"The underlying logic behind the Grand Bargain is that if donors and agencies each make changes (e.g. if donors reduce earmarking and agencies are more transparent with how funds are spent), aid delivery would become more efficient, freeing up human and financial resources for the direct benefit of affected populations."* (International Council of Voluntary Agencies, 2017, p. 2)

Today where humanitarian needs are on the rise, the trend goes clearly into the direction of more efficiency, whereas ten years ago this was not the case. This thesis looks at the factors which condition this inefficiency.

Information sharing is often considered as a generic cure for supply chain ailments and relief chain coordination is considered as key to improve its performance (Balcik, Beamon, Krejci, Muramatsu & Ramirez, 2015, p. 22; Forrester, 1958). Day, Junglas and Leiser (2009, p. 653) reflect on how information sharing might mitigate the effects of information impediments and contribute to an improved flow of resources. Other research found information management and relief activity coordination to be one area where research can contribute to the field of humanitarian logistics and supply chain management (Day et al., 2012, p. 32).

The environment where humanitarian workers operate is marked with complexity, uncertainty and urgency. Most scientific output sounds promising, however it remains theoretically abstract and is not easily applicable, especially for small and middle-size organisations. This Master Thesis attempts practical recommendations for improvement of information flows within an organisation. Recommendations are developed based on an in-depth analysis of the operational context of and impediments to information flow in emergency relief operations.

1.2 Research Question, Methods and Objective of Research

This research sets its goal to analyse the information flow in emergency relief operations in IHOs. IHOs work worldwide when sudden natural disasters strike, wars occur or in connection with long-term conflicts. They ensure the availability of swift, efficient humanitarian assistance (Ministry of Foreign Affairs of Denmark, 2017). This thesis focuses on IHOs operating in response to sudden-onset natural disasters. An important part of the research is based on the humanitarian response to Hurricane Matthew in Haiti, in October 2016. The main research question to be analysed is the following:

« What are the impediments to information flow, how can information flow be improved and how can these improvements be shared to increase applicability? »

First, impediments will be detected and compared with literature findings. Then, four conducted interviews provide the understanding of the context. A questionnaire retrieves the experienced impediments in the field. Subsequently, recommendations for improvement will be crystallized out of a process mapping. These recommendations for action are finally put into a format which is easily applicable for humanitarian practitioners.

This thesis understands under *impediments*, *information flow* and *improvements* the following:

Impediments are seen as obstacles to the process of sharing of information. These obstacles can be caused by the emergency setting, the organisational structure, the incomplete information system, the behaviour of people or the environment.	**Information flow** is seen in the wider perspective of information management, meaning that information undergoes several process steps from acquisition to organisation and to the use of the information (Detlor, 2010, p. 103). By Information, meaning-ful logistics- and project-related knowledge exchanged between Headquarter (HQ) and field team is meant.	**Improvements** are expected in terms of processes which advance productivity and foster efficiency, quality of decision making, performance of tasks (effectiveness) and increased learning.

Table 1.2: Definition of understanding of the terms impediment, information flow and improvement in this thesis.

The research question can be separated in three parts:

1. What are the impediments to information flow?
2. How can information flow be improved?
3. How should these improvements be shared?

The research methods interview, questionnaire and process mapping are chosen to examine these questions and serve for analysis and development of findings. Rosenstiel's (2010, p. 348) model conditions of behaviour is chosen to situate the found recommendations and to determine the associated approach of intervention. Finally, the discussion ends in the structure of a booklet, summarizing improvement tips for practitioners. The **hypothesis** assumes that the improvement of processes advances information flow which in turn contributes to the efficiency of humanitarian operations. The **objective** is to confirm scientific findings on impediments and to find out which processes improve information flow. Also, this project shall bridge the gap between theoretical abstraction and the operational needs in the field. To achieve this, it summarizes some of the key lessons learnt in information flow and translates them to the humanitarian field. These findings shall be put into a booklet which may be a helpful companion for practitioners, even if it is still in an early stage of development.

1.3 Scope of Research

The past few decades have brought immense technological and managerial innovations enabling us to have much more information than a few years ago. In order to set limits to this vast topic, the following section describes the scope and delimitation of the present research.

Within an organisation: The research will take place within an IHO in order to analyse the behaviour of people in the internal structure. Mainly, the humanitarian response to Hurricane Matthew of middle-size, Switzerland-based IHO Medair will be analysed. This enables a more precise case study analysis where improvements could possibly be implemented within the organisation. In contrast to this stands the information sharing (IS) between IHOs discussing mainly coordination, cluster structure and IS platforms which would only yield broad recommendations on coordination on international level.

Between headquarters and the field office: The sharing of information seems complex when done from HQ to a Field Office (FO) as the communication takes place via phone and not face to face. The challenges at the working place are different: the FO possibly suffers from electricity cuts and poor internet bandwidth, while HQ workers have fixed working hours. Also, the roles and tasks differ. Therefore, the exchange of information between HQ and FO can be challenging and when striving for improvement an interesting relation to research.

Time frame: The time frame is set on the first ten weeks of an Emergency Response (ER) in order to cover the period where relief activity was accomplished.

Information type: The information analysed is operational: In the beginning of an ER, decisions on the operating base, the project locations, the setup of a supply chain and discussions on the project design needs to be made with HQ. Logisticians as well as project staff are interviewed on how they share relevant information to HQ or field, depending on their function and location.

SPECIFICS	
Case	Hurricane Matthew, Haiti, October 4 to mid-December 2016
Information flow	Within an IHO, between HQ and FO, departments of emergency response and logistics
Time frame	First ten weeks, starting from the arrival of the team on ground until the almost-completion of the first relief project, the Quick Impact Project (QIP)
Information type	Operational information: logistics needs, program planning, changes in situational circumstances and related process, money and information flows

Table 1.3: Specifics of research.

1.4 Outline

The thesis is structured as follows. First, some contextual understanding is given on the fields of emergency relief, humanitarian logistics and information sharing. Second, the method design and approach is set out in more detail. Third, the results are presented, consisting of the evaluation

of interviews, questionnaire and process mapping. Four major impediments (decision making, time difference, shortage of funds and too many variables) are extracted and each summarizes different impediments to information flow. The established recommendations are then incorporated into an adapted, best-case scenario process map completing the result section. Fourth, the results are discussed against the background of the literature and recommendations for improvement are categorised and three of them are elaborated. At the end of the section, the booklet is presented, summarizing key improvements of information flow for humanitarian workers. Finally, the conclusion provides an answer to the research question and reflects on the limitations, implications, general learnings and other researchers that may concentrate on this area.

2 Literature review

Besides the selective and situational picture of disasters shown by media in the immediate aftermath, the everyday conditions in which emergency relief workers operate, are mostly unknown. This section looks first at the context and explains the differences between logistics in the private sector compared to the humanitarian field. The goal of humanitarian logistics is to save more lives while private logistics aims at profit maximisation. Yet, the connection to the private sector for learning objectives is useful in some areas, even if it stays limited in others due to its different working environment and goal. Due to the high importance of logistics in emergency relief, we then look at the context and the uniqueness of humanitarian logistics. Because of the fact that information systems support logistics and supply chain issues (Maiers, Reynolds and Haselkorn, 2005, p. 82) it is focused on information flow (IF) as third subsection. A definition of IF is attempted and then the focus is turned to impediments to IF and how processes assist for their analysis.

2.1 Characteristics of Emergency Relief

How is a disaster defined and what is the difference operating in the humanitarian versus the commercial sector? Both are compared and some typical characteristics like uncertainty and complexity are reflected upon. Furthermore, it is explicated how the humanitarian principles regulate coordination and enable effective humanitarian action.

2.1.1 Definition of Emergency Relief and Comparison to Commercial Sector

The term emergency and disaster are herein used interchangeably. The United Nations Office for Disaster Risk Reduction (UNISDR) defines **disaster** as:

> "*A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources*" (Reliefweb, 2008, p. 22).

There are different kinds of disasters (compare figure 2.1.1). This thesis focuses on the natural, sudden-onset disaster of Hurricane Matthew in October 2016 that destroyed big landscapes of Haiti and then moved up north along the eastern coast of the United States of America. However, some of the responses of the experts may also refer to slow-onset, man-made, or combined

disasters (such as the crisis in South Sudan, a combination of a famine and a political/refugee crises).

	Natural	Man-made
Sudden-onset	Earthquake Hurricane Tornadoes	Terrorist Attack Coup d'Etat Chemical leak
Slow-onset	Famine Drought Poverty	Political Crisis Refugee Crisis

Figure 2.1.1: Different kinds of disasters (Van Wassenhove, 2006, p. 476).

Disaster response describes the decisions and actions taken during and after a disaster and comprises three different phases: immediate relief, rehabilitation, and reconstruction (Reliefweb, 2008, p. 22). We will be looking at the immediate relief, emergency response or emergency relief, defining it as the

> "*immediate survival assistance to the victims of crisis and violent conflict. Most relief operations are initiated on short notice and have a short implementation period (project objectives are generally completed within a year). The main purpose of emergency relief is to save lives*" (Reliefweb, 2008, p. 22).

Comparing private with humanitarian logistics, we find important differences (see table 2.1.1).

Aspect	Private	Humanitarian
Purpose	Economic Profit	Social impact
Context	Uninterrupted	Interrupted
Perspective on time	Time is money	Time is life (or death)
People served	Paying customers	Beneficiaries
Source of funds	Paying customers	Donors
Workforce	Paid staff	Volunteers, paid staff

Table 2.1.1: Commercial logistics versus humanitarian logistics (Tatham & Christopher, 2014, p. 21).

The context is one of complexity and uncertainty resulting from a diversity of factors (Van Wassenhove 2006; Tatham & Spens, 2011). Humanitarian workers often operate under a high level of uncertainty in terms of demand, supplies and assessment (Day et al., 2009). Achieving a timely and comprehensive picture of what is required is often a big challenge, due to difficulties of reaching beneficiaries (Tatham & Spens, 2011, p. 10). Access to remote areas can be a huge problem, especially after a disaster destroyed inevitable infrastructure or when the infrastructure

is not existent in the first place. Also, one may not be able to anticipate or see local factors such as customs and habits as they are invisible (Van Wassenhove 2006, p. 478). Or the interactivity of factors may cause another disaster (e.g. after long periods of rain, mudslides are likely) (Van Wassenhove 2006, p. 478). Often, factors such as the lack of resources, trained personnel and accurate information also contribute to complexity. The cause-effect relationship when the disaster escalates seems generally unclear and one cannot tell the causing variables (Van Wassenhove 2006, p. 478). Disasters are completely different one to another, therefore using evaluations for a next operation is not always obvious. High staff turnover is a contributing factor to complexity and limits institutional knowledge and learning (Thomas & Mizushima, 2005, p. 60; Van Wassenhove, 2006, p. 477).

Multiple stakeholders are involved, including donors with their legitimate claim for information (Thakur-Weigold, Besiou & Wagner, in press). Non-Governmental Organisations (NGO) have stakeholders that do not pay for their service (e.g. beneficiaries), however still have an important stake in the organisation. Hence, internal and external communication, rising donor accountability and transparency place high demands on the organisation. The likely absence of stable communication infrastructure complicates information flow even more (Tatham & Spens, 2011) and the need for robust equipment is definite (Van Wassenhove, 2006).

Finally, the pressure of time determines between life and death. Urgent responsiveness is one of the most mentioned factors in humanitarian response. It appears to push the performance criterion of efficiency to second place (Day et al., 2009, p. 639). Day et al. (2009, p. 638) find in their analysis of the Hurricane Katrina response that the efforts to provide help were inefficient. This is seen in contrast to the private sector, where the performance of the supply chain is directly rewarded by the market through higher revenues and profits and internal incentives like bonuses advance constant improvement (Van Wassenhove, 2006, p.477). However, if humanitarian operations were more efficient, more lives could be saved.

2.1.2 Humanitarian Principles

Humanitarian action is based on the four principles of humanity, neutrality, impartiality and independence (Van Wassenhove, 2006, p. 478). Humanitarian actors thus do not operate in a certain area because a political party says so, but trust their needs assessment and assist where the greatest needs are. In order to establish and maintain access to people affected by natural disaster or complex emergencies and deliver effective humanitarian aid, the compliance with the principles is essential (United Nations Office for the Coordination of Humanitarian Affairs

UNOCHA, 2012). The principles were derived from the International Committee of the Red Cross and the national Red Cross/Red Crescent Societies and endorsed in General Assembly resolution 46/182 (UN General Assembly, 1991). The fourth key principle independence was added in 2004 by General Assembly resolution 58/114 (UNOCHA, 2012). Humanitarian action takes place in complex political and militarized environments (UNOCHA, 2012). The humanitarian principles distinguish humanitarian action from political, military or other actors (UNOCHA, 2012).

Promoting the adherence to humanitarian principles is essential for effective humanitarian coordination (UNOCHA, 2012). The commitment to these principles is expressed at an institutional level through the Code of Conduct for the International Red Cross and Red Crescent Movement and International Non-Governmental Organisations (INGO) in disaster relief. The humanitarian charter as well as the minimum standards in humanitarian response elaborated by the Sphere Project serve as standards for the sector (UNOCHA, 2012).

2.2 Humanitarian Logistics

Relief goods are purchased in a logistics department in order to distribute them to beneficiaries urgently needing them. Most of the funds go into logistics, thus this is where improvements will have the biggest impact on efficiency and therefore performance of the operation. The ultimate goal of an IHO is to alleviate suffering; if this can be done more efficiently, goods are distributed faster and to more people which results in more lives being saved. The next section compares private with humanitarian logistics, defines humanitarian logistics, views its uniqueness and reflects on the use of information technologies.

2.2.1 Context and Definition of Humanitarian Logistics

Donors are becoming more aware of expenses and thus put IHOs under greater scrutiny to monitor their impact (Van Wassenhove, 2006, p. 475). IHOs therefore strive to become more results-oriented, accountable and more transparent (Van Wassenhove, 2006, p. 475). Humanitarian disaster relief supply chains directly influence 60 to 80 percent (Day et al., 2012, p. 27; Van Wassenhove, 2006, p. 475; Wagner, Thakur-Weigold & Stumpf, 2013, p. 30) of the total spend of IHOs. Van Wassenhove (2006, p. 475) and Kelly (1995) therefore suggest to achieve transparency through efficient and effective logistics operations, thus well planned Supply Chain Management (SCM). It is estimated that more than 40 percent of this spend is ultimately wasted due to duplication of effort and lack of time for effective spend analysis (Day et al., 2012, p. 27;

Thakur-Weigold et al., 2015). Therefore, analysing and improving logistics is key for improving performance. Humanitarian logistics is defined 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 point of origin to point of consumption for the purpose of meeting the end beneficiary's requirements"* (Thomas & Mizushima, 2005, p. 60).

This definition includes the tasks of: preparedness, planning, procurement, transport, warehousing, tracking and tracing as well as customs clearance (Thomas & Mizushima, 2005, p. 60). Logistics plays a crucial role providing valuable perspectives on the effectiveness and efficiency of an operation as well as for post-event learning (Cozzolino, 2012, p. 6; Tatham & Spens, 2011, p. 13).

2.2.2 Comparison with the Private Sector

To the private sector, logistics is a planning framework for the management of information, material, service and financial systems (Van Wassenhove, 2006, p. 476). The business sector understood long ago that logistics is crucial to performance, provides a rich source of data and is the most expensive part of any operation (Van Wassenhove, 2006, p. 476). Subsequently, the industry has realized the importance of using efficient supply chains as well as inclusion into planning and budgeting (Van Wassenhove, 2006, p. 476). Unfortunately, humanitarian logistics of INGOs is around 15 years behind in terms of strategic positioning within planning.

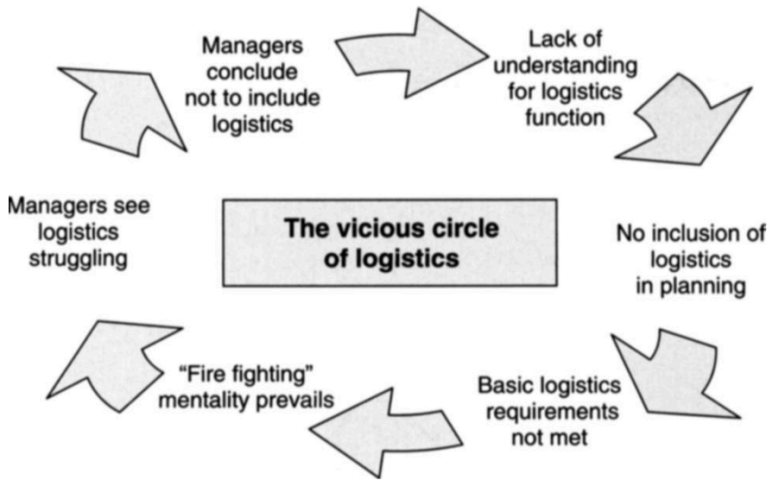


Figure 2.2.2: The vicious circle of logistics (Van Wassenhove, 2006, p. 477).

Even though logistics plays a key role in many INGOs (Tatham & Spens, 2011, p. 14), their department (if logistics is considered as a department at all) is seldom involved in strategic planning, resulting in a vicious circle: the lack of understanding for the function and its importance leads to non-inclusion in planning and budgetary processes (e.g. in proposals), resulting in logistics requirements not being met (e.g. delays in reporting) and therefore a firefighting mentality prevails (Van Wassenhove, 2006, p. 477).

On top of that, most funding is directly for relief and thus, support services obtain little resources for development (Thomas & Mizushima, 2005, p. 60). This is in stark contrast to the private sector were developments are fostered to push efficiency and thereby making more profit. Thomas and Mizushima (2005, p. 61) found in their survey with 92 humanitarian logisticians that there is no systematised and comprehensive training in humanitarian logistics, albeit great need and potential do exist. The same authors (Thomas & Mizushima, 2005, p. 60) thus pledge for a more standardised logisticians training in order to achieve efficient operations, improved communication and cooperation and improvement of job satisfaction and mobility through external skills validation. The next section explains why this training must be different to private sector SCM trainings: because of the uniqueness of humanitarian SCM.

2.2.3 Uniqueness of Humanitarian Supply Chains

Van Wassenhove (2006, p. 480) describes supply chains as a network between suppliers, distributors and customers which is supported by three kind of flows: material, information and financial flows. Humanitarian supply chains are unique in different ways (Day et al., 2012, p. 24) (Table 2.2.3).

Van Wassenhove hits the nail on its head by saying "unlike logisticians in the private sector, humanitarians are always faced with the unknown" (Van Wasenhove, 2006, p. 480). And still, uncertainty is also part of the private sector. Tatham and Christopher (2014, p. 9) see uncertainty as the key connection between commerce and humanitarian logistics and advise to synchronize activities across networks. This enables flexible responses to changes in demand. Synchronization must partly be achieved through technology solutions, which is described in the next subsection.

UNIQUENESS	AUTHORS
Command and control issues: if the local government does not request it, no international action can take place	Day et al., 2012, p. 24
Life and death vs. profit and loss	Day et al., 2012, p. 25
Short supply chain life-cycles: new networks of relationships have to evolve within hours and subside in a matter of months, comparable to transient supply chains	Day et al., 2012, p. 23 + 640
Supply chain formation: always changing stakeholders, security is a fundamental issue and alternatives are limited	Day et al., 2012, p. 25
Centralized vs. decentralized coordination systems: where an understanding of local conditions is important, a central authority far from the action makes suboptimal decisions	Dolinskaya et al., 2011, p. 3; Stephenson, 2005, p. 340; Thakur-Weigold et al., in press
Decision making: much of the decision making favours local autonomy over centralisation	Tatham & Christopher, 2014, p. 22
Donor independence: few resources are given in advance, rather as more specific needs are identified and requests are sent out, donors may decide on what to give. However, the donor decides what they provide and that may not always be what agencies and beneficiaries need (leading to unsolicited goods)	Day et al., 2012, p. 25
Changing operational priorities: local conditions are highly dynamic, requiring different responses and resources	Day et al., 2012, p. 25
Large number of stakeholders: uninvited but self-initiated participants, uncoordinated donors, media, governments, the military, beneficiaries and many INGOs with different political agendas, ideologies and religious beliefs raise concerns regarding information sharing and coordination. It is estimated that the west is home to 3-4,000 INGOs (Tatham and Spens, 2011, p. 9)	Day et al., 2012, p. 26; Tatham & Spens, 2011, p. 9; Van Wassenhove, 2006, p. 477
Press coverage and publicity: the love-hate relationship between press and NGOs is reflected in this paradox: press personal seizes much-needed resources, though publicity arising from coverage generates donations	Day et al., 2012, p. 26

Table 2.2.3: Factors of uniqueness of humanitarian supply chains.

2.2.4 Information Technologies and Integrated Software

Tatham and Christopher (2014, p. 57) see the importance of information technologies (IT) support to logistics and SCM as a driver of improved internal efficiency. The systems of electronic data exchange and other IT enables the transmission of data to centralized storage and processing and provides then real-time data to all relevant members of the supply chain (Sahin & Robinson, 2002, p. 514). It enables quantitative analysis as well as setting of performance targets for different supply chain functions (Tatham & Christopher, 2014, p. 60). Sahin and Robinson (2002, p. 517) argue that real-time sharing mitigates demand uncertainty, however does not completely eliminate it.

Some of the larger organisations developed online platforms to support information sharing (IS) and coordination during an emergency response (Dolinskaya et al., 2011, p. 3). IT systems are developed and rolled out in the preparation phase, so that they come into practice when an emergency happens (Cozzolino, 2012, p. 9). However, most smaller or middle-size INGOs only

have little budget (if at all) for process improvements between operations. Funding is usually project based and few invest in long-term organisation-wide infrastructure (Maiers et al., 2005, p. 86). Donors prefer to give for relief and want to see beneficiaries assisted rather than expensive technologies purchased and introduced. Many donors still see overhead costs (including information communication systems) as detrimental to a proposed project and reduce it to the minimum (Maiers et al., 2005, p. 85). To make matters worse, humanitarian operations require robust equipment that can be set up and dismantled quickly (Van Wassenhove, 2006, p. 477) and is more expensive. Information management systems using dashboards to show the performance of the projects are quite costly when including the introduction and training costs. For this reason, smaller organisations primarily use different combined low-budget tools such as Microsoft Excel and different cloud services. IT surely facilitates information sharing, however the degree of facilitation depends on the resources of the organisation.

The next section elaborates the definition of information flow and its impediments.

2.3 Information Flow

When operating in an emergency, many activities include networking, coordination, providing others with information, decision making and giving orders. In the communication between HQ and the field team, the communication is not taking place face to face, but via phone or video calls as well as through emails and documents exchange. The message transferred is then influenced by many disruptions. This section looks at the general basic model of communication process and then goes on to define information flow in the specific context of emergency relief. Moreover, the relevance of information flow upon material flow is explicated and the impediments to IF found in literature are listed. Finally, process management tools are discussed to provide a perception of potential improvement possibilities.

2.3.1 Basic Model of Communication

When we look at the basic model of communication, we realize that there might be a lot of disruption while sending a message. The intended effect may not be the same as the actual effect. The information transaction process is disrupted by many factors from the environment, but also in regards to the person's behaviour and experiences (Schuppener, 2017). In order to be sure that the receiver has understood the message the speaker intended to send, a feedback loop is required.

Language: The international language for disaster relief is English. However, the internal language for the teams might be German, as the organisation could be based in Switzerland and may be required to write the reports to institutional donors in German. An alignment in reporting is therefore required, however the field language could still be English. The language also impacts the culture of an organisation.

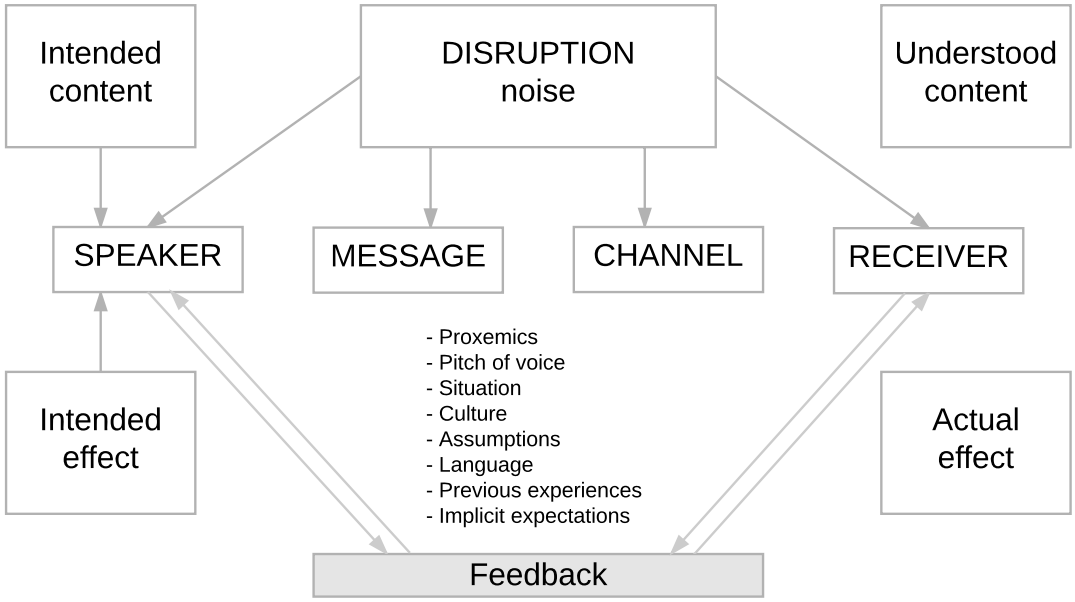


Figure 2.3.4: Basic model of communication (Schuppener, 2017).

Culture and personality: When teams communicate with each other, every person is embossed by his culture, his personality as well as the working preferences. In disaster response, the expatriate teams are from multicultural backgrounds and operate on the field in yet another culture. It is useful to know one's own culture and its orientation in communication: is it an explicit communication with rather indirect or intransparent dialogue (Japan) or an implicit communication with direct communication (Germany) (Kumbier & von Thun, 2014, p. 49). Knowing how the own culture functions will enable this person to understand the difference of other communication structures.

The same is true for the personal orientation and with working preferences. Relationship or task orientation determines the way how people can work together in teams: whether a person sees trust as a condition for success (relationship orientation: "first building trust, then we can work together") or as a result from efficiency (task orientation: "first we work efficiently together, then I can trust you") is a fundamental difference (Kumbier & von Thun, 2014, p. 298). A task-oriented person reproaches a behaviour-oriented person with exaggerated social conduct without view for success and the behaviour-oriented person sees the task-oriented person as reckless profit

seeking and over correctness without inclusion of situations (Kumbier & von Thun, 2014, p. 298). In an IHO, this could be a behaviour-oriented field project officer sharing the increasing needs of the population (as his team found a new region of destroyed villages not known before) to his task-oriented colleague at HQ who strictly wants to finish a project instead of reacting to the circumstances and open a new project. The mutual understanding seems crucial in order to cooperate sensitively towards both orientations. Also, the collaboration between teams can depend on the working preferences. The team management system classifies eight roles for a successful team (Schuppener, 2017). Knowing where one's preferences lie can be critical for the personal professional development, fosters team working and the organisational culture (Team Management System, 2017). Therefore, based on a person's knowledge about the orientation of his culture, his personal relationship or task orientation as well as his working preferences, a person is more aware and can communicate consciously.

2.3.2 Definition of Information Flow

This thesis will look at how information flows from HQ to the field office, involving several process steps. Even though Information Management (IM) covers a wider range of process activities, its definition helps to understand the flow of information. **Information management** can be defined as:

> *"The application of management principles to the* ***acquisition, organisation, control, dissemination and use of information*** *relevant to the effective operation of organisations of all kinds. 'Information' here refers to* ***all types of information of value****, whether having their origin inside or outside the organisation, including: data resources, such as production data; records and files related, for example, to the personnel function; market research data; and competitive intelligence from a wide range of sources. Information management deals with the* ***value, quality, ownership, use and security of information*** *in the context of organisational performance"* (Wilson, 2003, p. 263).

Information flow is understood as all type of data or information of value which are acquired, organised, disseminated and used in the context of relief project management and logistics. Tatham and Spens (2011, p. 12f) differentiate between data (organised facts), information (interpreted data) and knowledge (internalization of information, data and experience). This thesis looks at the information exchange between HQ and the field. Therefore, the IF within the field team or at HQ only is excluded. It is important to see information in the context of

organisational performance, because IF improvements are sought to foster organisational performance. The organisational perspective on IM views information as a strategic resource.

2.3.3 The Impact on Material Flow

Humanitarian logistics definitions generally include the control of resource and information flows (Thomas & Mizushima, 2005; Van Wassenhove, 2006). Material flows represent the physical product flows and information flow represents order transmission and order tracking which coordinate the physical flows (Van Wassenhove, 2006, p. 480).

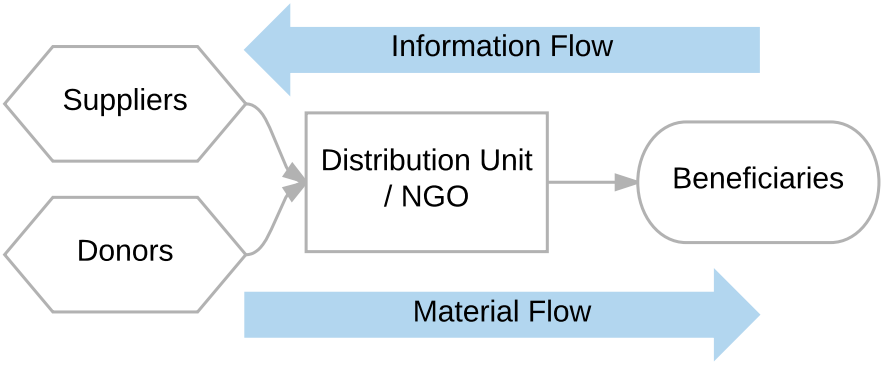


Figure 2.3.3a: Relation between information flow and material flow.

Figure 2.3.3a shows a simplified model of the relation between material and information flows: Information flow determines material flow as without a needs assessment with beneficiaries, the INGO does not know what kind or emergency relief items are requested. The INGO then processes this information. Fundraising kicks in to receive finances for a certain distribution and the INGO procures relief items through suppliers. These items then pass through a distribution unit such as a regional headquarter and is finally distributed to the beneficiaries.

In their mathematical analysis, Lee, So and Tang (2000, p. 626) found that the value of demand information sharing can be of crucial importance, especially in complex cases. If the organisation did not have the needs information in the first place, they would not know what relief items are requested. Knowing the context, the climate and the culture is crucial for planning. Thakur-Weigold et al. (2015, p.29) show in their study on training humanitarian workers how information and resource flows in relief look like. The humanitarian supply chain is an interconnected system involving flows of goods, funds and information (figure 2.3.3b).

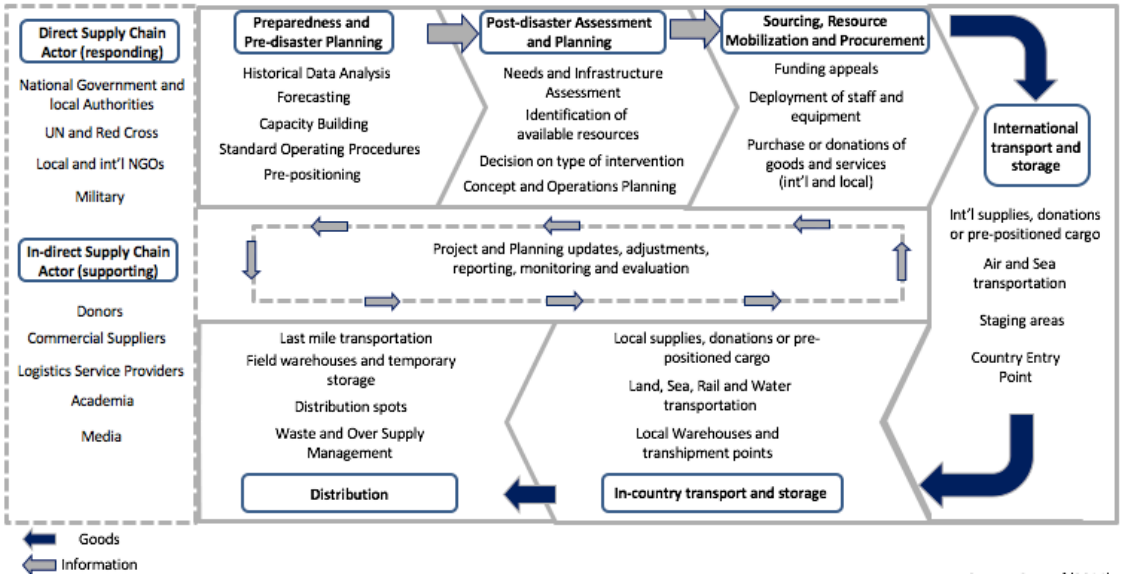


Figure 2.3.3b: The integration of goods and information in a humanitarian supply chain (Thakur-Weigold et al., 2015, p. 29).

Many researchers correlate improved IF with better **performance** (Thakur-Weigold et al., 2015; Tatham & Christopher, 2012; Anand & Mendelson, 1997). Thakur-Weigold et al. (2015, p. 29) states that not even personal knowledge, but missing well-managed information flows can set up humanitarian logistics to fail. Tatham and Christopher (2012, p. 61) found that the introduction of an online SCM application produces better and more timely information which in turn supportes better management practices. Van Wassenhove (2006, p. 475) sees better preparedness as a mitigation of the effects from man-made disasters. On the other hand, Day et al. (2009, p. 640) states that despite introductions of information systems, appropriate system performance remains ambiguous.

Scientific research lays considerable emphasis on the relationship between IF improvement and the **efficiency of supply chains** (Sahin & Robinson, 2002; Day et al., 2009; Day et al., 2012; Akhtar, Marr and Garnevska, 2012). Day et al. (2009, p. 638) and Sahin and Robinson (2002) state that the leveraging of information flows improves supply chain performance in normal industries. Day et al. (2009, p. 654) argues that the established connection between IF and material flow also extends into disaster relief scenarios. Coordination of information flows and resource flows influences the efficiency of the latter (Day et al., 2009, p. 639) and is seen as a generic cure for supply chain ailments (Sahin & Robinson, 2002, p. 510). Day et al. (2009, p. 640) reason that the variability and uncertainty can be better managed, however in the context of disaster relief it has not yet been considered how to foster these IF, as it shall present substantial difficulties. This is the reason why the thesis looks at how IF can be improved.

Coordination is seen as an intermediary between information and resource flows. Good information sharing is a prerequisite and a key factor for good coordination (Reindorp & Wiles, 2001, p. 31; Akhtar et al., 2012, p. 94; Sahin & Robinson, 2002). In turn, closer collaboration yields more effective supply chains (Van Wassenhove, 2006, p. 475). Akthar et al. (2012, p. 96) views a good coordinator as the determining factor for timely deliveries. In this sense, collaboration and coordination consists of a wide range of activities like negotiating, contracting, measuring performance, attending conferences etc. (Akhtar et al., 2012, p. 96). Akhtar et al. (2012, p. 94) found that it was essential to not ignore any kind of information, especially coordinating activities such as meetings, appropriate information sharing and traveling were crucial for the success of the chain's coordination. Besides financial resources which enable coordination activities (Akhtar et al., 2012, p. 94), leadership and relationship management skills are also key sources for success (Akhtar et al., 2012, p. 96f). The success or failure often depends on who resumes the supply chain, how it is managed and if the coordinator is able to develop effective relationships (meaning a commitment to quality from supplier and customer) with chain partners (Wong et al., 2005).

The study of Day et al. (2009, p. 650) showed that supply chain information flows improved resource flows. However, information flow was also influenced by several impediments (Day et al., 2009, p. 650). The sharing and management of information in this complexity is not a simple task (Tatham & Spens, 2011, p. 9). The next section therefore looks at impediments which thwart the flow of information.

2.3.4 Impediments to Information Flow

The first crucial information in an Emergency Relief Operation (ERO) is the complete assessment sheet from the field team, providing field and HQ with an overview of the needs of the affected population. If the sheet is not completely filled in because the assessor does not understand what is required or the data is simply not available (e.g. due to problems of humanitarian access), essential information could be missing. Often merely the reading of the demand sheet can be one of the biggest sources of friction in this turbulent nature (Day et al., 2012, p.32). Another effect generated by the combination of interacting causes is the bullwhip effect; the supply chain's natural tendency to augment and delay demand orders (Forrester, 1958; Sahin & Robinson., 2002, p. 514).

Such problems can cause an interruption, or an impediment to information flow. The literature mentions numerous causes of such obstacles. Table 2.3.4 gives an overview.

	IMPEDIMENT	EXPLANATION	AUTHOR(S)
1. Emergency Setting	Urgent responsiveness	Urgent responsiveness of disaster environment strain IF	Day et al., 2009; Dolinskaya et al., 2011; Kelly, 1995; Seybolt, 2009; Van Wassenhove, 2006
	Extreme uncertainty	Crucial Information about relief item such as time, place, type of product, quantity, and potential supply sources may not be known	Balcik et al., 2009; Day et al., 2009; Seybolt, 2009; Van Wassenhove, 2006
	Short supply chain life-cycle	Processes are rapidly created and modified with little time to formalize associated information flows	Day et al., 2009; Denning, 2006
	Complex environment	Complexity and chaotic nature	Van Wassenhove, 2006
	Many stakeholders & demands	Donors are influential and request greater donor accountability and transparency	Balcik et al., 2009; Dolinskaya et al., 2011; Van Wassenhove, 2006
	Inaccessibility	Physical non-availability: information systems were unprepared or broke down	Day et al., 2009
	Unreliability	The organisation's low level of confidence in data or information it possesses	Day et al., 2009
2. Organisational Structure	No standards	Individual solutions to share information	Thakur-Weigold et al., in press
	Lack of sense of ownership for decisions	Ambiguity; people do not take responsibility for decisions	Thakur-Weigold et al., in press
	Roles and Responsibilities are not clear	Ambiguity; people do not take responsibility for tasks as their role is unclear	Thakur-Weigold et al., in press
	Lack of process knowledge	Uncertainty about who to involve in IS	Thakur-Weigold et al., in press
	Low information priority	Not placing appropriate precedence on IS	Day et al., 2009
	Source identification difficulty	Not knowing where to obtain information/no access	Day et al., 2009
3. Information Systems	Inadequate stream of information	Shortage or overload of information	Day et al., 2009
	Storage media misalignment	Storage constrains efficient IS	Day et al., 2009
	Inconsistent data and information formats	Different dimensional or field definitions. "Playing safe" -> take the highest number to be sure	Day et al., 2009
	Online system not being used much	Data in online system not up to date, fragmented & stored in too many places	Thakur-Weigold et al., in press
4. Behaviour	Overworked staff & no time for information sharing	Lack of importance on reporting leads to too many projects and IS suffers	Thakur-Weigold et al., in press
	Info access depends on interpersonal relationships	Uncertainty leads to unofficial channels of communication	Thakur-Weigold et al., in press
	HQ does not understand the field	Too far from field reality, information is not transferred due to lack of understanding	Thakur-Weigold et al., in press

Table 2.3.4: Impediments to information flow in literature (page 1/2).

5. Environment	**High Staff turnover**	Not all information is transmitted when staff leave and are replaced	Thakur-Weigold et al., in press; Van Wassenhove, 2006
	Lack of skilled logistics worker	Unskilled staff do not realize the importance of their IS	Akhtar et al., 2012
	Coordination costs	Smaller INGOs cannot afford the additional costs like traveling to meetings -> less IS quality	Akhtar et al., 2012; Balcik et al., 2009
	Cultural conflicts	Different ways of working, living and thinking create conflicts and impede transfer of exact message	Akhtar et al., 2012; Thakur-Weigold et al., in press
	Not everyone is in the information loop	Exclusions lead to not having the specific information	Thakur-Weigold et al., in press

Table 2.3.4: Impediments to information flow in literature (page 2/2).

Many of these impediments are due to failing or incomplete processes. If complete, installed and observed by everyone, many obstacle could be dispelled. The next subsection examines the effect of improved processes on these impediments.

2.3.5 Process Management

Improvement of information flow can be done through process management. A variety of tools and techniques support process management and improvement, most of them come from the commercial sector (Tatham & Christopher, 2014, p. 22) and include approaches like lean management and Total Quality Management (TQM[1]). Lean is a methodology for the reduction of waste and produces better performance with existing resources. For example, World Vision applied a lean six sigma approach for process improvement in Eastern Africa and showed that TQM approaches also apply to INGOs (Parris, 2013). World Vision's goal was to get better outcomes for existing funds, staff and other resources (Tatham & Christopher, 2014, p. 22). The understanding and application of TQM concepts and tools reduced the average time for procurement and recruitment by 40-80 percent and the annual expenses by one million dollars (Parris, 2013, p. 458).

Bartell, Haselkorn, Kemp and Lappenbusch (2006, p. 157ff) realized that effective information sharing is becoming increasingly fundamental to the humanitarian relief sector and propose the production of new knowledge in a more complete process map of emergency response

[1] Total Quality Management is a management approach aiming at increasing business and reducing losses due to wasteful practices. Management and employees are involved in the continuous improvement of processes, products, services and the culture in which they work (Hashmi, 2017).

information flow. A process map or a value stream map is another lean management method for analysis and design of sequences of a product or a service (Bartell et al., 2006, p. 160; Tatham & Christopher, 2014, p.31). Value stream mapping resumes all actions required to bring a product or a service through the essential flows (Rother & Shook, 1999, p. 3). It principally is a pencil and paper tool providing understanding about the flow of material and information as a product or service makes its way through the value stream (Rother & Shook, 1999, p. 4). The information flow thereby is as important as the material flow as it tells each process what to do next (Rother & Shook, 1999, p. 5). It can be used as a communication, business planning or change management tool (Rother & Shook, 1999, p. 9).

3 Method Design

Methods explain the “what is meant” and the “how it is known”. The subsequent section gives answers to the following questions:

- What was the approach to the research?
- Which theoretical model was used?
- Which techniques where employed?

The section also explains why it was chosen to use these methods, model and techniques.

3.1 Approach to Research

For this research, a qualitative approach is chosen. Humanitarian operations and disaster research have not received significant theoretical and practical research attention (Day et al., 2009; Thakur-Weigold et al., in press). The phenomenon of rapid-onset natural disasters finds itself in a complex and extreme environment, where its impact upon environment and people is considered to be dramatic while somewhat unpredictable (Day et al., 2009, p. 640). Qualitative methods provide the advantage of flexibility for investigating the uniqueness of a specific case, the emergence of new themes (Eisenhardt, 1989, p. 539) and a continuous view of change which is inherent to humanitarian crisis. Also, some aspects of a phenomenon may not be fully exploited at the beginning of the inquiry (Day et al. 2009, p. 640). The qualitative approach is therefore very suitable to explore the subject of information flow in a rapidly changing environment.

This thesis was developed in an approach in five steps. First, the literature on humanitarian operations and information flow was screened. Second, the identified impediments to information flow were gathered and analysed. Next, the interview, questionnaire as well as the process mapping was designed by taking into account the impediments. The data collection (conduction of interviews and process mapping and sending out the questionnaire) was completed in step four. This paper uses a combination of process and value stream mapping to map the information flow and find the impediments and the corresponding improvements. In last step, the evaluation and the concrete recommendations for action were developed and then translated into a booklet.

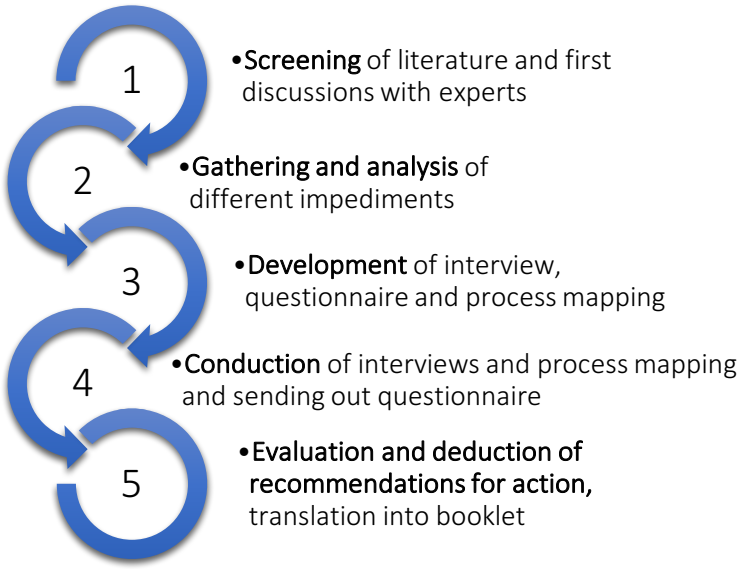


Figure 3.1: Approach in five steps.

Step 1 – Screening of literature and first discussions with experts

Through a broad analysis of literature, more than 60 relevant sources could be identified. The literature was reviewed and impediments to information flow in the humanitarian context were identified. At the same time, discussions with experts were conducted in phone calls to scope the subject. This enabled proximity to reality on the ground and flexibility with associated themes. The objective is to build on a solid theoretical foundation as well as to ensure the outcome suitability for daily use.

Step 2 – Gathering and analysis of different impediments

The vast literature needed to be systematized into different topics (characteristics of emergency relief, humanitarian logistics and information flow). Then, all similar impediments to IF identified in the literature were gathered under the same generic term. Authors were listed. Then, these obstacles to information flow were analysed and a description was formulated for each (used in table 2.3.4 and in the questionnaire).

Step 3 – Development of interview, questionnaire and process mapping

In step three, interview questions were formulated and the questionnaire is derived from the impediments detected in literature. The interviews were conducted to understand encountered problems on the ground. The questionnaire listed the identified impediments to IF and asked the experts how frequently they experienced this obstacle. The process mapping was designed with the help of the questionnaire results and the advice from Medair's process excellence expert. The

internal evaluation, the lessons learnt and new strategic decisions in reaction to Hurricane Matthew were discussed in direct communication with Medair's Emergency Response Team (ERT) in order to understand the circumstances at Medair before the process mapping was conducted.

Step 4 – Conduction of interviews, process mapping and sending out questionnaire

Following the first discussions in step one, four semi-structured interviews with humanitarian experts working in three different INGOs were conducted to elaborate the subject and seek confirmation of academic topics. The interviews also provided practical tips which could then be incorporated in the booklet. After the interviews were conducted, the focus of the thesis was narrowed down and the questionnaire was adapted. Subsequently, the questionnaire was sent out to discover the frequency in which the participants experienced the impediments. It also provides an indication of the relevance of the individual problems on ground. Finally, the information flow process mapping with Medair was conducted. The combination of process and value stream mapping allowed a concrete look of the material, financial, process and information flows between the different players in the first few weeks of the Hurricane Matthew response.

Step 5 – Evaluation and deduction of recommendations for action, translation into booklet

The results from the data collection were then documented and evaluated. The described material and information flows in the process mapping were arranged with Post-it notes on a poster. During the process discussion, many problems were diagnosed and some improvement ideas were already collected. Then, results were documented (section 4.3) and four obstacles encountered in the case of Haiti are discussed (section 4.4). Subsequently, recommendations were formulated with process specialists, based on the process mapping and on the background of the interview and questionnaire findings. A best-case scenario of Haiti was designed. After the documentation of the results, the impediments were discussed and merged with the literature regarding emergency relief, humanitarian logistics and information flow. The recommendations for action then were systematized on the basis of the conditions of behaviour-model. By means of a prioritisation matrix, three recommendations were elaborated in detail and a generalisation of which approach to improvement could work for which recommendation is ventured. Finally, the booklet is developed as a handy summary of recommendations and relevant topics for humanitarian practitioners.

3.2 Theoretical Model

The theoretical model helped categorize the recommendations for improvement of problems faced in information sharing.

In most cases, information is shared consciously from one human being to another. Information flows from the sender through a channel to the receiver (basic model of communication, figure 2.3.1). The modality of how information is transmitted depends on the behaviour of two persons and the channel used. Information sharing is therefore disassembled through Rosenstiel's theoretical model conditions of behaviour, a model which analyses the prerequisites or conditions contributing to human behaviour (that is sharing, incomplete sharing or no sharing of information). The recommendations are categorised in this model in order to understand the conditions for the realisation for each recommendation[2]. Based on the categorisation into the four conditions, the recommendations can be drawn from that.

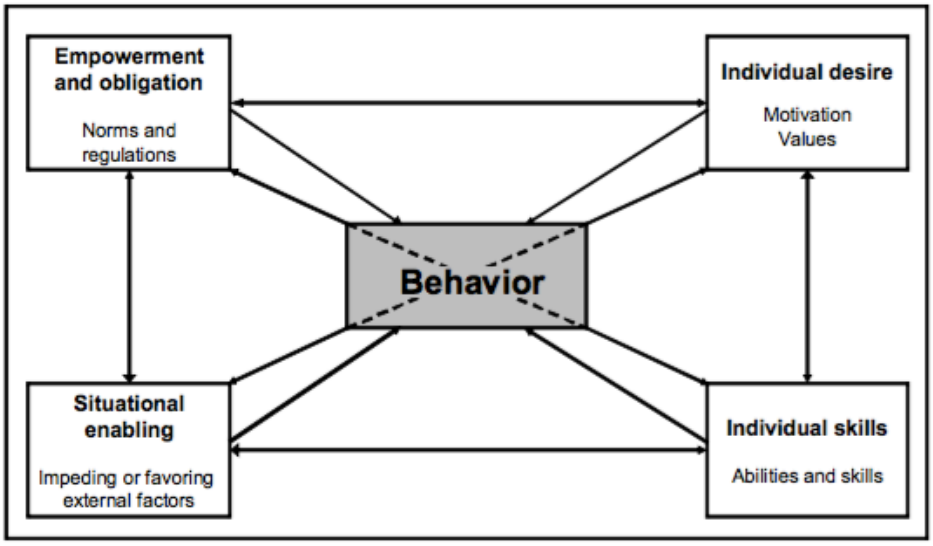


Figure 3.2: Model conditions of behaviour (Rosenstiel, 2010, p. 348).

When it comes to the causes of human behaviour, Rosenstiel and Nerdinger (2011) differentiate between *volition* and *ability* of the person involved, meaning their willingness and capacity to share information and *empowerment and obligation* of the situation, meaning the given organisational norms and regulations on information sharing. *Situational enabling* is added as

[2] The impediments to IF could have been categorised into the model also. This would have enabled the comprehension of the roots of these impediments. However, since the establishment of the recommendations to these impediments was done based on the research and not based on the model, the categorisation of impediments into the four conditions is not an additional benefit.

fourth condition, describing the circumstantial impeding or enabling factors to information sharing (Rosenstiel, 2010, p. 347). Rosenstiel (2010, p. 347) suggests asking four questions whenever an employee's behaviour does not meet the expectations:

- "Was he not able to do it?
- Did he not want to do it?
- Was he not allowed to do it?
- Did he not have the necessary resources or were there impeding barriers?" (Rosenstiel, 2010, p. 347).

These four conditions influence each other and most importantly have an effect on the behaviour of a person. When recommendations for the improvement of information flow can be located in one of the four conditions, the underlying factors can be identified and levers for action may be drawn. Depending on the condition, the lever to handle the improvement is of a different nature and extent.

CONDITION OF BEHAVIOUR	QUESTION	EXPLANATION in regards to IF	DEPENDING ON	LEVER TO SOLVE THIS
Individual skills	Would the personal abilities and skills enable the person to act?	Being able to do something, by a specific nature, circumstances or entitlement	Skills and methods of communication and project management	Training
Individual desire	How do motivation and values influence individual action?	Intent and will to transfer information to another entity	Intrinsic and extrinsic motivation	Difficult to influence. Maybe partly with HR-incentives
Empowerment and obligation	Do norms and regulations allow a specific action?	Have the permission, legitimately entitled and authorized to share information	Management, incentive systems	Influenced by managers who take decisions on change
Situational enabling	Which impeding or favouring external factors exist?	Technical issues or situational enablers or disablers to share information in a specific setting	Emergency setting, technical infrastructure, security, circumstances	Difficult to influence

Table 3.2: Conditions of behaviour (Rosenstiel, 2010) adapted to information flow.

3.3 Data Collection Techniques

Information flow in emergency response is analysed through interviews, a questionnaire and a process mapping.

SECTION	TECHNIQUES
Literature review	Table listing impediments according to theme and with listing of different authors writing about this obstacle
Research	1) Semi-structured interviews looking at the context of the organisation (4 p.) 2) Questionnaire asking the frequency of the experienced impediments (10 p.) 3) Process mapping (1 emergency response team)
Discussion	- Categorizing impediments into Rosenstiel's conditions of behaviour model - Prioritisation matrix to choose three improvements for elaboration - Booklet summarizing the improvement recommendations and ideas from the interviews

Table 3.3a: Overview of data collection techniques.

Booklet: Subsequently, the solutions to these impediments shall be made accessible to practitioners in the field to provide models for improvement. The goal is to give practical ideas on how to better communicate in difficult situations. The learning method was inquired in the interviews in order to propose an appropriate format. This thesis proposes to share improvement recommendations in a booklet.

ORG.	NO. OF EMPLOYEES	MAIN TYPE OF WORK	NO. OF RESPONDENTS	FORM OF PARTICIPATION	FUNCTIONS OF RESPONDENTS
Medair INGO1	1.200	Shelter, WASH	7	I, Q, PM	ERM, ERO, IMO, LM, LO
MAF INGO2	1.000	Logistics, Telecommunications	2	I, Q	ERM
ICRC INGO3	> 5.000	Security, Health, Shelter, Humanitarian Law	1	I, Q	LO
INGO4	n.s.	n.s.	1	Q	ERM
Caritas CH INGO5	> 1.000	Shelter	1	Q	ERM
SHA GO	> 1.000	WASH, Shelter, Cash	1	I, Q	ERM

Notes: WASH-Water, Sanitation & Hygiene. **Form of participation**: I-Interview; Q-Questionnaire; PM-Process Mapping. **Functions of respondents**: ERM-Emergency Response Manager; ERO-Emergency Response Officer; IMO-Information Management Officer; INGO-International NGO; LM-Logistics Manager; LO-Logistics Officer

Table 3.3b: Overview of details regarding organisations and respondents.

The sample consisted of five small- and middle-sized INGOs and one governmental organisation (GO), with a total of 13 respondents. The participants originated from different departments

within their organisation and were positioned either at HQ or in the FO. A total of four semi-structured interviews were conducted with a logistics manager, a logistics officer and two emergency response managers. Ten questionnaires were filled out by six emergency response managers, one emergency response officer, two emergency logistics officer and one information management officer. One semi-structured process mapping took place with a team of four with INGO1 at their HQ in Switzerland.

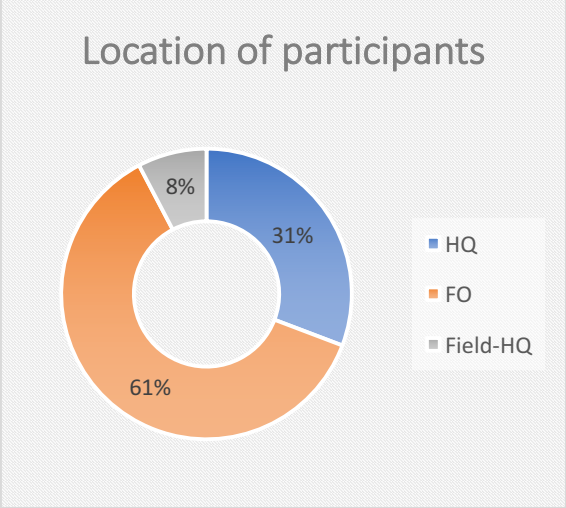


Figure 3.3a: Location of participants. Field-HQ is a regional headquarter in a field country.

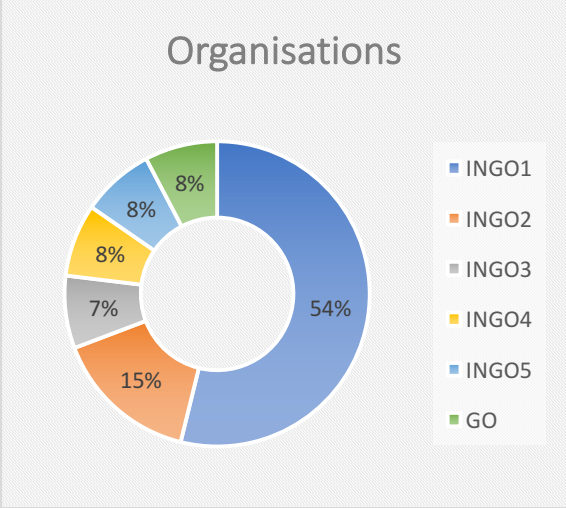


Figure 3.3b: Participants according to their organisation.

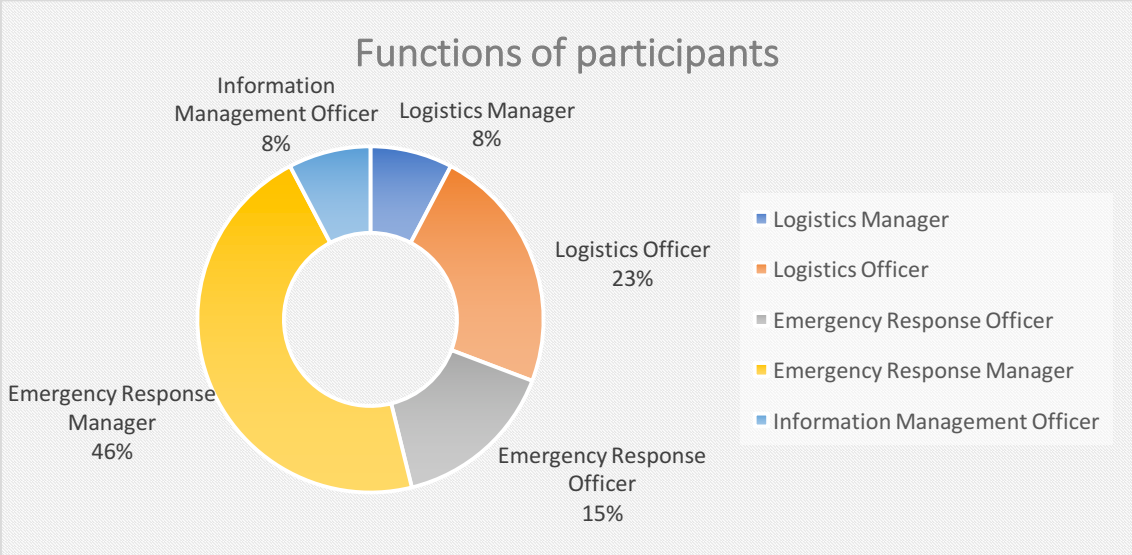


Figure 3.3c: Functions of participants.

Experts: The nature of the study required to select interviewees having first-hand experience of the humanitarian response to Hurricane Matthew in terms of information flow between HQ and FO. The experts experienced the impediments to information flow and can hypothetically think of what could improve information sharing during an interview. Participants who interfaced

between operational and strategic level to capture the reasons behind certain decisions were chosen. In addition, participants who had merely operational experience were also interviewed in order to receive practically applicable ideas on the format how to share information.

3.3.1 Interviews

Four semi-structured interviews were conducted in order to fathom the subject. Each interview lasted from 40 to 60 minutes and was done face to face, via skype or by phone. As an opening question in each interview, the participants were asked to reflect the structure of their organisation's communication culture. Open-ended questions were asked to obtain their perspectives on IF in their organisation in five areas: organisational structure, communication, people and complexity of emergency response. These questions varied from one organisation to the other in order to seek the problem areas of information flow. Follow-up questions were asked to avoid incomprehension on the researcher's side. In closing, the interviewees were asked about learning methods in order to grasp the format in which recommendations shall be transferred. The interviews were recorded and the transcription transferred to an interview results table (Appendix). The realization of the vastness of this subject through the interviews led to a more concrete approach. The time limit and the restriction onto the relationship HQ to FO in a specific emergency relief operation was fixed after the interviews (for the process mapping).

3.3.2 Questionnaire

The questionnaire was then filled out by ten different experts in emergency relief who operate in both sudden-onset, slow-onset and man-made and natural disasters. The goal was to see which impediments found in the literature are experienced in the field. In the first part, the respondents were asked to imagine their last emergency relief operation where they played a major part in and state their function and experience. The second part consisted of five groups, including each five to seven impediments to information flow. These impediments were found in literature and similar obstacles were classified into the same group. The respondents were asked to indicate the frequency (rarely, sometimes, often) to which this impediment was experienced in the before mentioned emergency relief operation.

1. EMERGENCY SETTING	2. ORGANISATIO-NAL STRUCTURE	3. INFORMATION SYSTEMS	4. BEHAVIOR	5. ENVIRONMENT
Urgent responsiveness	Structure	Inadequate stream of information	Overworked staff and no time for IS	Staff turnover (emergency phase)
Extreme uncertainty	Need to standardise	Storage media misalignment	Info access depends on interpersonal relationship	High staff turnover (generally)
Short supply chain life-cycle	Lack of sense of ownership for decisions	Need of robust equipment	Language barriers	Lack of skilled workers
Complex environment	Roles and responsibilities are not clear	Inconsistent data and information formats	HQ does not understand the field	Coordination costs
Many stakeholders and demands of donor accountability and transparency	Lack of process knowledge	Online system not being used much	Unwillingness	Cultural conflicts
Inaccessibility	Low information priority			Not everyone is in the information loop
Unreliability	Source Identification difficulty			

Table 3.3.2: The five groups listing the impediments from the questionnaire.

3.3.3 Process Mapping

Finally, the ERT of the middle-sized IHO Medair took part in the process mapping. The combination of a process and a value stream mapping consisted in a semi-structured conversation and lasted 120 minutes. In the first part, the participants were asked to give details about the reasons and improvement possibilities for the impediments which they classified as "often" in the questionnaire before. In the second and main part, the participants were requested to map the process of the first weeks of the humanitarian response to Hurricane Matthew. The group session with INGO1 was conducted with the emergency response manager, two emergency response officers and the logistics officer. The actions of different functions were registered on separate horizontal lines. Money flows, information flows, material flows and process flows were recorded whilst operational project steps, documents and decisions as well as logistic tasks counted as process steps.

Problems became apparent and were marked as such and improvement ideas were discussed and noted. The initial process map was complemented by a timeline and a matching of the diagnostics with corresponding recommendations. Finally, these recommendations were incorporated into the process mapping, which resulted in an adapted, ideal best-case scenario process map.

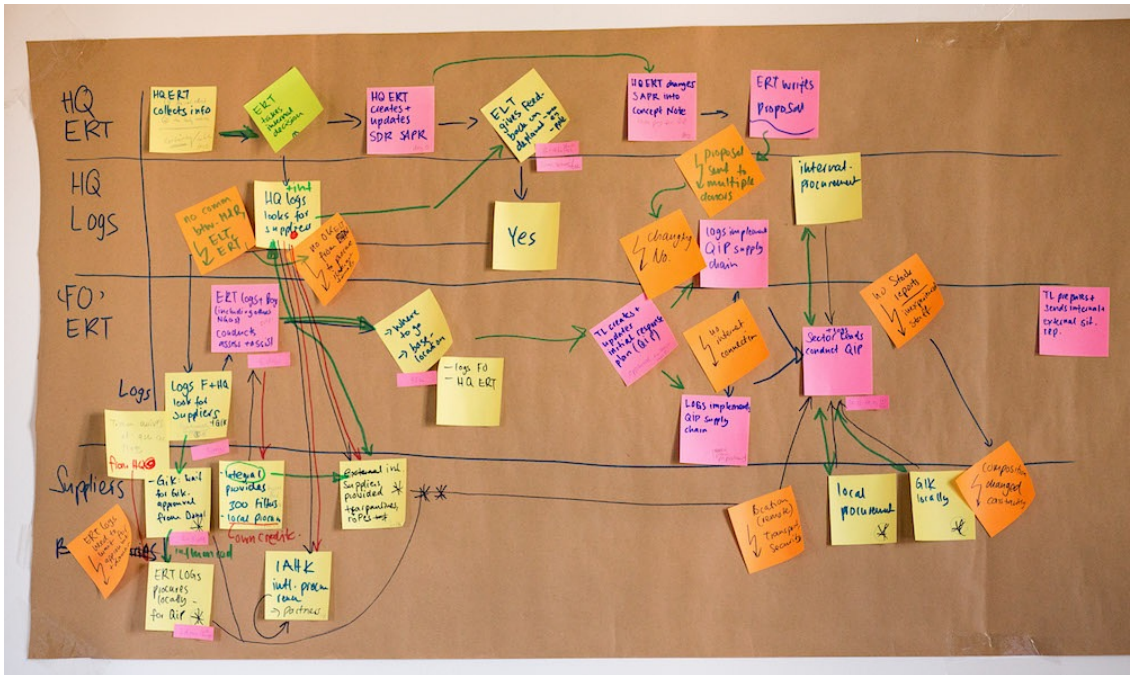


Figure 3.3.3: Process map of ERT Medair response to Hurricane Matthew in Haiti.

3.4 Data Interpretation Techniques

The interpretation and discussion of the results adheres to the approach of Brinkmann (2013), who requires a careful analytical procedure. In the results section, the collected data is described as they have been comprehended. Four impediments are extracted from the results of the interviews, questionnaire and the process mapping. The mapping including the discussion with the ERT yielded many inputs concerning impediments and recommendations. As the ERT had been conducting an extensive evaluation and had already been thinking about improvements in a prior workshop together, these rich and reflected inputs were suggested during the mapping. For interpretation, a timeline was created after the mapping, in an overview depicting the difference between planned and actual response. Another figure confronted diagnostics (problems) to recommendations and corresponding pairs were connected. These recommendations result from mapping, interviews, literature and the discussion with process experts. The specific data analysis formed a spiral around the four conditions of behaviour, consolidating with each bend. For the discussion and appreciation, the results were classified in the three topics of the literature review. Then, the improvements were categorized into Rosenstiel's conditions of behaviour model and three of them were elaborated. It should be mentioned that the scheme of Rosenstiel was used as a general guideline to make sense of the data while remaining alert for emerging themes. The categorization was deemed helpful for identifying the context and the improvements for IF.

4 Results

This section presents the results of the study. First, the interviews provide the understanding of the context and the questionnaire indicates the frequency to which impediments to information flow are experienced in the field. Then, the outcomes of the process mapping with Medair are presented with the initial process map and a timeline. Consequently, the impediments are summarized under four topics: decision making, time difference, shortage of funds and too many variables. Then, the impediments from the mapping are compared to the impediments found in literature. Subsequently, these diagnostics are matched with corresponding recommendations. The process map is then adapted with the proposed improvements to a best-case scenario. Finally, the research question on how improvements shall be shared is answered.

4.1 Interviews

In each of the four semi-structured interviews different questions were asked. The statements will be used to give background to the questionnaire and the process mapping. The most common topics were *roles and responsibilities* (who is responsible for bringing into the meeting which information and who decides) and *clear lines of communication* (indicating who shares information with whom). Some of the significant statements shall be depicted below.

Organisational structure	- In a matrix organisation, logistics is 'only' a support function. Ideally, logistics should be involved in strategy. - Hiring people without much experience and assigning them responsible roles is a problematic state at our organisation. - The organisation is ready for change; however, money is the limiting factor. - Procurement in Haiti was difficult as no supplier could be found. In the end, suppliers from Dominican Republic were used.
Communication	- We do not have an information management system including information from all departments. We only use different small tools, but no all-encompassing, which would offer steering tools for managers, among other useful things. - Checklists are good, however, need a lot of training which is costly. - Clear lines of communication: Only the head of crisis at HQ and team leader field exchange information, which offers a clear structure. - The collaboration with partners in the field is essential for successful operations and long-lasting good relationships.
People	- We do not take enough time for training, resulting in the lack of skilled workers. - The local and expat teams complement each other: Sometimes the locals have no technical knowhow, but the vital cultural understanding for collaboration. - The decision authority is at HQ, but they closely work with the head of field and use their information for decisions. - Clarification of mandate of different divisions is important. - We deliver the desperately needed relief items first, then everything else.

Table 4.1: Significant statements from the interviews (page 1/2).

Improvement ideas	- Too many people are in a meeting -> Clear roles and responsibilities would simplify discussions and decisions. - Inexperienced staff -> clear career development, introduction of exams, Staff training & capacity building could improve the technical skills of staff. - No overview of operations -> more measurement and management skills needed to gain overview of operational performance. - Difficult collaboration within a matrix organisation -> find out how to work together across functions - Losing time through non-use of satellite communication due to high costs -> use expensive communication tools and allocate these costs in funding application proposals.

Table 4.1: Significant statements from the interviews (page 2/2).

For INGO2, an air transport providing organisation, the complex environment is less complicated: Normally, a large number of stakeholders and their demands can be an impediment to IF (Van Wassenhove, 2006; Day et al., 2012; Tatham & Spens, 2011). However, MAF works as a service provider in telecommunications and transport and sees their task to serve in networking this large number of stakeholders. Through networking, information is received and the organisation is able to react and provide air transport. Due to their profession as pilots, the staff are used to work according to checklists and follow them accurately. As their service consists in networking and providing transport for often the same NGOs, some structures appear to be clearer than they are for IHOs providing humanitarian relief in completely unknown territory to unknown beneficiary groups. Also, many pilots have been working for the same organisation and often in the same place for a long time which simplified information flow based on these established structures.

Due to the fact that “disasters are very different, and one to the other is not comparable” (F. Jörimann, personal communication, April 25, 2017), the aforementioned statements and improvement ideas are specific to the according organisation and are not easily generalizable.

4.2 Questionnaire

The participants were asked in the questionnaire to which extent (rarely, sometimes or often) the listed impediments were experienced to be an obstacle to information flow in their chosen emergency operation. Ten relief experts from both HQ and field offices provided their experiences. Where added comments were unclear, further inquiry via phone or email gave understanding concerning the causes for problems and their ideas for improvement. These further explanations were added under “Why and where was this a problem?” and “What was good? / Improvements?”. Most frequently mentioned answers (six or more) are circled (table 4.2).

Questionnaire categories	Impediments to information flow	Explanation of impediment	Was this an obstacle to information flow? Rarely	Sometimes	Often	Why and where was this a problem?	What was good? / Improvements?
1. Emergency Setting	Urgent responsiveness	*The urgent responsiveness of the disaster environment influenced information sharing. E.g. Too much organization on site, no time to communicate this to HQ.*	3	3	4		
	Extreme uncertainty	*Receiving information of uncertain quality (regarding demand, supply and assessment).*	1	5	4		
	Short supply chain life-cycle	*Processes are rapidly created and modified with little time to formalize associated information flows.*	5	3	2		
	Complex environment	*The complexity and chaotic nature of managing information flows.*	2	3	5	_no infrastructure _too many distribution locations and suppliers _security issues	_smaller project
	Many stakeholders & demands of donor accountability and transparency	*Donors have become influential in prompting humanitarian organizations to think in terms of greater donor accountability and transparency.*	5	1	4	_Service provider stands amongst many stakeholder _Partners not familiar with rapid response concept including clear lines of communication	**_clear structures** _importance on networking _cooperation btw. specialized technical team and contextual expertise
	Inaccessibility	*Physical non-availability of information (Information system break downs, unprepared data).*	2	4	4	_Transfer of information physically not possible	_Cloud server, mobile data collection, GIS mapping, visual dashboards _consistant and informative communication (mngt) _Reliability
	Unreliability	*An organization's low level of confidence in the quality of data or information it possesses.*	2	6	2	_Uncertainty about initial information	
2. Organisational Structure	Structure	*Centralized (decisions made at HQ) or decentralized (decisions made in the field location).*	6	2	1	_Lacking of coordination function by logistics _Overall structure of RR unit difficult to understand by other units	**_Set logistics as advisors,** not only support function _Enable evidence based activities _INGO2: flexible structures, aim at decisions at lowest level possible
	Need to standardize	*Processes are not standardized.*	4	5	1		
	Lack of sense of ownership for decisions	*Ambiguity leads to people not taking responsibility for certain decisions.*	4	3	3	_Final authority unclear	_Define final authority _Clear lines of communication
	Roles and responsibilities are not clear	*Ambiguity leads to people not taking responsibility for certain tasks.*	4	6		_before sending out a team	
	Lack of process knowledge	*Uncertainty about the role makes it unclear who should be involved in which communications.*	5	2	3		
	Low information priority	*Failure to place appropriate priority on information sharing.*	3	5	1		
	Source Identification difficulty	*Not knowing where to obtain data or information.*	6	3	1		
3. Information Systems	Inadequate stream of information	*Shortage or overload of information.*	3	4	3	_Collecting of relevant information _Time difference complicated IF	_Not changing numbers, but instead set **one project block** _Reduce variables **_Prepositioning**
	Storage media misalignment	*Information storage inherently constrains efficient information flow activities.*	2	5	3		
	Need of robust equipment	*Condition of technology and the definition of manual processes.*	2	5	3		
	Inconsistent data and information formats	*The sources are not consistent, or definitions vary. People "play safe" by taking the highest number and go with that.*	2	4	4	_Constantly adapting numbers _Different recording sheets	**_Standard templates/forms**
	Online system not being used much	*Leading to data in online system not being up to date, fragmented & stored in too many places.*	2	3	4		
4. Behavior	Overworked staff & no time for IS	*Feedback/Reporting is less of a priority.*	3	4	3		
	Info access depends on interpersonal relationship	*Due to uncertainty, staff improvise and establish unofficial channels of communication.*	2	5	3		
	Language barriers	*Not understanding a language can make people not attending a meeting*	3	4	3		
	HQ does not understand the field	*HQ is too far from field reality.*	4	4	2	_Wrong estimation on HQ side	_Communication schemes
	Unwillingness	*When one person decides not to transfer data or information to another person (due to regulatory law constraints or personal preference).*	5	4	1		

Table 4.2: Questionnaire results and comments from further inquiry (page 1/2).

5. Environment	Staff turnover (emergency phase)	*When staff leave, not all relevant information is shared with the replacement.*		5	5	_Inconsistent data (distribution sheets) _Handover	
	High staff turnover (generally)	*Skilled staff are always in short supply.*	1	1	8		
	Lack of skilled workers	*Insufficient availability, internationally or locally.*	2	3	5	_Lacking working knowledge (Signatures, instructions missing)	_Establish & communicate minimum SOPs
	Coordination costs	*Resources for meeting, travelling and hiring special staff for coordination are limited.*	5	4	1	**_Lack of connection to and understanding of other departments** _Distinguishing big/small costs	_Vice versa understanding and adaption
	Cultural conflicts	*Different ways of working, living and thinking which can create conflicts in certain situations.*	4	5	1		_Sensitivity with Embassy
	Not everyone is in the information loop	*People are excluded which leads to not having specific information.*	3	5	2		

Table 4.2: Questionnaire results and comments from further inquiry (page 2/2).

In the following, each of the five group is discussed in regards to the roots of the problem and the improvement ideas.

Emergency setting: Where security issues and bad or inexistent infrastructure hinder the organisation to perform distributions easily, and too many suppliers and locations complicate the operation, the organisation would reduce the size of the project next time. Sometimes the transfer of information is physically not possible. There, a well-managed cloud server and the conscious management of consistent and informative communication could reduce gaps. Where stakeholders are too many and demands from donor accountability are high, clear structures can help. The strong vote for unreliability (*sometimes* in six out of ten) of information is observed. The problem there lied in uncertainty about the initially shared information, which made the planning insecure.

Organisational structure: When logistics is set as an advisor function (instead of a support function), they are able to assist with their expertise along the whole supply chain which enables evidence-based activities, instead of only partial intervention without planning. The definition of roles and responsibility as well as the ownership for decisions came up as one of the major time-wasters. Instead, definition of final authority and clear lines of communication could improve decision making and the understanding of roles and responsibilities. The majority considered roles and responsibility not being clear (*sometimes* in six out of ten). If a person is unsure about his or her responsibilities, logically the IS will not be congruent with the role.

Information systems: Major problems were the constant adaptation of numbers by the field team and the use of different recording sheets by various distribution leaders. This lead to confusion at HQ as the adaptation of numbers could not be comprehended and the different sheets did not assure the assessment of the same data, which was difficult for other departments. Therefore, with standardised forms, the organisation could ensure the transfer of all relevant information. In order to prevent the field team from adapting their assessment numbers, setting one project

block is suggested, so that the field team would finish that project and if the numbers needed to be corrected, they could start a second project block.

Behaviour: Wrong assessment of security issues from HQ side led to unfounded concern for the field team. The difference of information from HQ and from the field appeared to be important. Calling a security advisor for his opinion in this situation could be a first option. Also, direct conversations within a structured communication reasoning scheme could be a starting point for other incidences. Such a scheme would define a structure where the security worries have to be well argued.

Environment: The high staff turnover impacts projects negatively, as due to incomplete or inexistent handovers, much information is lost. Also, the lack of experience and working knowledge can be compensated through the establishment and communication of standard operation procedures. Lack of connection between the departments can be restored through mutual understanding and adaption of interface processes. Many of these interpersonal issues are connected with sensitivity and empathy on both sides.

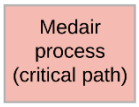
The questionnaires filled out by the ERT were discussed during the subsequent process mapping in order to understand the background of the judgements. The following section shows the results from the process mapping.

4.3 Process Mapping

The process mapping was done with the emergency response team of Medair, a Switzerland based international relief and recovery organisation. In order to learn from an example, the most recent disaster was chosen: their emergency relief response to Haiti in October 2016 after Hurricane Matthew. The hurricane destroyed whole landscapes and the strong winds caused extensive flooding and mudslides and left 1.4 million people in need of humanitarian aid (Reliefweb, 2016). Medair reacted quickly and sent a logistician to Port-au-Prince within 24 hours after the hurricane made landfall. Two days later, the first wave (ERT) arrived to conduct an assess and assist operation in the first week. After information was gathered, the team distributed the first 300 relief items. At the same time, procurement and project planning kicked in. This took longer than expected and on the 25th day after the hurricane passed, the quick impact project was conducted by the second wave (the first ERT was replaced by a second ERT). Handover to programs and reporting followed. The initial process mapping was done together with the HQ-based ERT officers, the field-based emergency response manager and the first logistics officer.

4.3.1 Initial Process Map

Already before the Haiti response, Medair already worked on a flowchart indicating the different steps in a disaster response. This chart is an overview of all tasks and activities taken by several departments during an emergency. The initial process mapping for the research of this thesis took especially the first and second ERT (wave one and two) into focus, whereby the Medair processes defined on the flowchart (critical paths) were integrated. The process mapping looked at the flows in between these tasks and activities and asked what kind of information flowed and from whom to whom. The focus was placed on information flow and the encountered problems (impediments). In the process mapping, different colours are used to distinguish information, process, material and money flows. 13 impediments were identified during the team discussion. The subsequent pages show the process of the first ten weeks of the Medair response.



Timeline: After the mapping, a timeline is added to demonstrate the difference between the planned emergency response procedure of the organisation and the actual mission in Haiti in 2016. The planned procedure times are drawn from internal Medair documentation (emergency deployment cycle). A drastic time delay can be observed in the Quick Impact Project (QIP) and in the in-depth assessment and relief program.

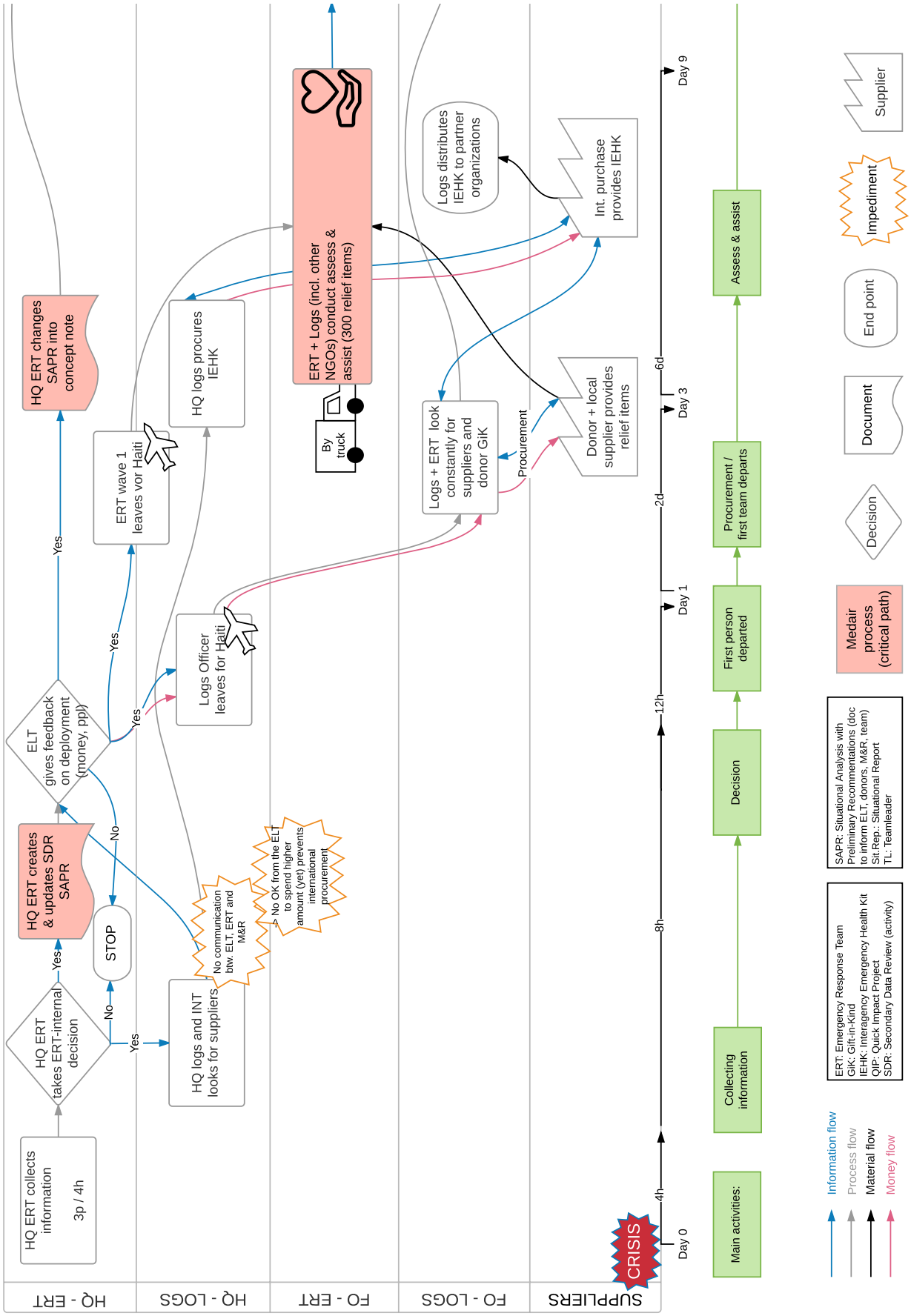


Figure 4.3.1: Initial process mapping with Medair ERT on the emergency response to Hurricane Matthew in Haiti, October 2016 (page 1/2).

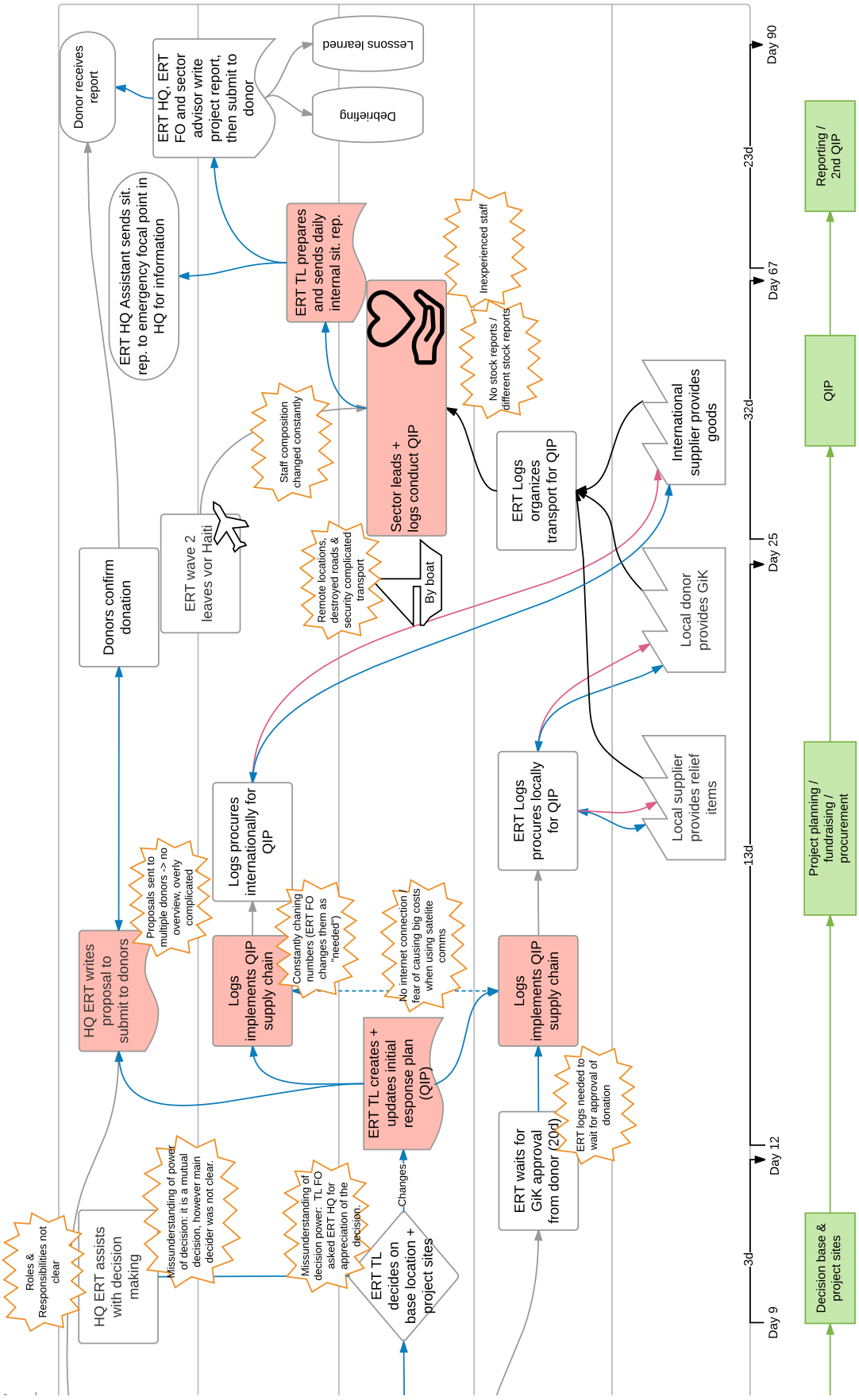


Figure 4.3.1: Initial process mapping with Medair ERT on the emergency response to Hurricane Matthew in Haiti, October 2016 (page 2/2).

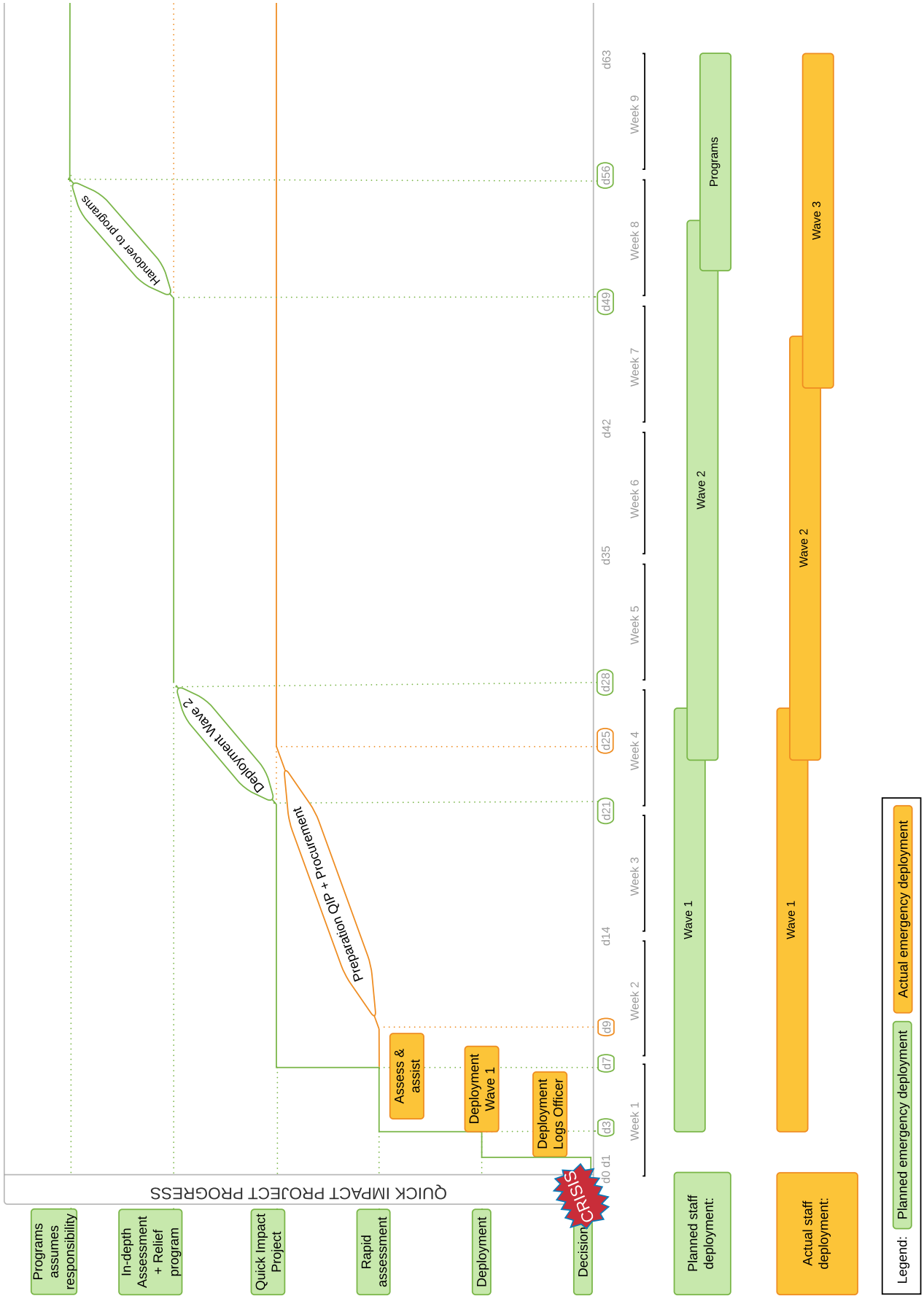


Figure 4.3.2: Timeline of the emergency response; planned (green) and actual (orange) (page 1/2).

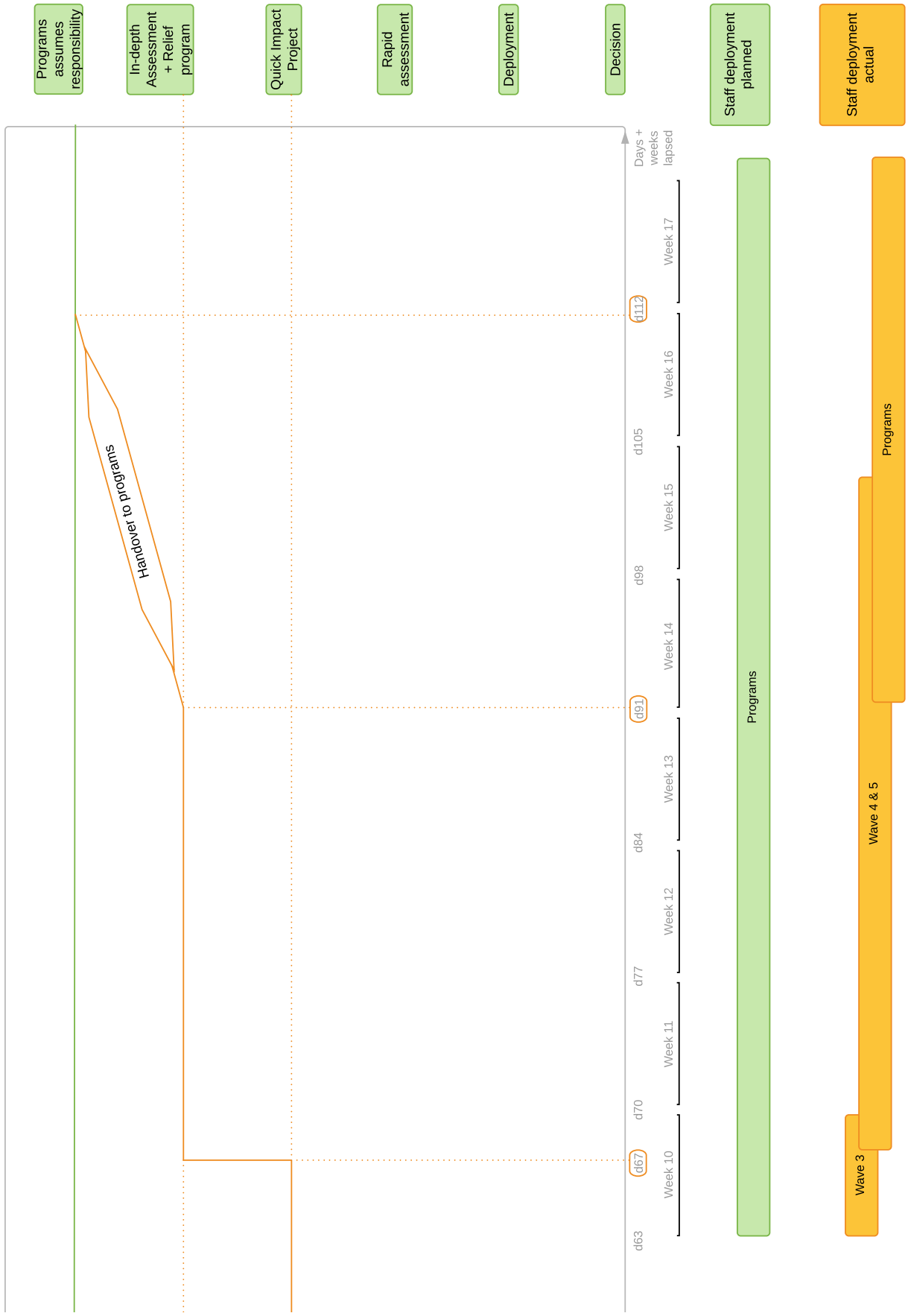


Figure 4.3.2: Timeline of the emergency response; planned (green) and actual (orange) (page 2/2).

4.3.2 Timeline

The development of ideas for the *timeline* as well as the *diagnostics and recommendations* (section 4.6) resulted from a discussion with two process experts after the process mapping. The timeline illustrates the difference between the planned and the actual emergency relief operation in relation to time lapsed. The horizontal axis shows the time lapsed in weeks. The vertical axis lists the various project steps in an emergency relief operation taken by the ERT until the project was handed over to the programs department (according to the Medair emergency deployment cycle). Below in the green and orange boxes, the different waves of staff deployed can be seen. The green line shows the planned intervention steps in the emergency deployment cycle[3]. The orange line shows the actual steps in the Haiti operation.

It is observed that the first relief distribution (*assess and assist*) happened timely in the first week. After that however, the procurement took much more time than planned. The *Quick Impact Project (QIP)* was planned to happen from day 7 to day 21. Instead, the team used the time from day 9 to day 25 for procurement and organisation of transport. Due to security reasons and the non-existence of roads, ships had to be organised, which took more time as planned. Then, the *QIP* started on day 25 and ended on day 91 after the hurricane struck Haiti. The timeline shows a time discrepancy in the starting date (18 days) and in the duration of the *QIP* (14 days planned versus 66 days actual). Consequently, the *in-depth assessment and relief program* (distribution of additional parts as well as new items) started 39 days later, and the duration was 24 days (compared to 21 days planned). The time lag could not be caught up, but the difference in the duration of the *in-depth assessment and relief program* is not essential.

However, the discrepancy of the starting date of *QIP* as well as its duration in time is major. This looks like being the effects of a bullwhip effect, the supply chain's natural tendency to delay orders. When looking at the reasons for this discrepancy, the team listed many causal factors. The next section looks at these factors.

[3] It should be mentioned that the ER concept expects three activities to be conducted in the first three to four weeks: Assessment, the QIP as well as keeping donor relations on track. It is not specified when assessment should end and QIP begin as it is a fluent transition. Therefore, a timely implementation in the first three weeks is less important. Nonetheless, the QIP is an ideal levelling board to see the problems in relation to time.

4.4 What were the Impediments to Information Flow in the Case of Haiti?

The subsequent section discusses four major obstacles encountered in the interview, the questionnaire and the process mapping. It resumes the answers from different organisations, whereas the focus is on Medair.

4.4.1 Decision Making

In the process mapping it is observed that not knowing who has the decision power slowed the process down; consulting the whole field team and HQ for their opinion prolonged the process and in the end, it took the team leader three days to decide on the base location and operation locations. The organisation underlines participatory decision making and still, the main decision maker often remains unclear. This slows the process down and the confusion about who takes which decision is predestined.

4.4.2 Time Difference

The time difference appeared to be a central problem for Medair and for the Swiss Humanitarian Aid Unit (SHA, the humanitarian arm of the Swiss Agency for Development and Cooperation). Haiti being seven hours behind Swiss time meant that HQ decided at the end of their working day about next plans and strategies. Subsequently, the teams in Haiti would start their work. This implied a fast communication from HQ to the field. Medair struggled to communicate efficiently. The field office did not see the changes in plan and thus worked on out-dated information while HQ decided already to change plans. The SHA realized the problem in early stages and installed a reporting system which enabled the field team to receive the responses to their requests just on time to start the next working day.

4.4.3 Shortage of Funds

In this specific case, logistics and ERT found that the feeling of not having enough funds limited many project initiatives. Not having the clearance to spend higher amounts prevented international procurement in the first few days. It also meant people were aware of the limits, afraid to spend too much money and thus did not use satellite communication very often. As a consequence, crucial information was sometimes withheld and shared later on. When discussing the mapping, Medair's process excellence expert said that there has always been enough funding for sudden-onset disasters in the end (A. Parris, personal communication, April 24, 2017). For

protracted crisis and long-lasting emergencies, it is true that resources are very limited. Somehow, this fear of not having enough finances overlapped from longer emergencies to emergency relief. The knowledge that for rapid-onset emergency relief there is always enough funding could change the perception and the way head of departments and teams plan and procure relief items. This thought could go even further: the emergency team leader could receive from the fundraising team leader the average amount of finances his department would fundraise in this type of emergency after a certain period of time (B. Thakur-Weigold, personal communication, April 24, 2017). Thus, the emergency team leader would be bolder in planning and procuring. Consequently, the FO would not have a mindset of inappropriate frugality (fear of causing big costs) when using satellite communication in remote areas, instead they would communicate their assessed information as soon as possible.

The finances for governmental units are not as tight as for some INGOs. Still, the reporting is also done thoroughly due to the taxpayer who wants to know how his taxes are used. But the availability of enough funding enables the organisation to plan many of trainings and choose well qualified staff. Having enough experienced staff can represent quite a challenge for smaller and middle-sized INGOs.

4.4.4 Too many Variables

The operation in Haiti was overly complex. Medair chose three suppliers of hygiene kits to be distributed in fifteen locations based in regions hardly accessible. The staff changed every two to three weeks and they had different levels of experience. The team leaders used different (or no) reporting forms at distributions, which complicated the reporting of evidence. Some staff constantly adapted the numbers of beneficiaries of relief items required, which was not passed on to all concerned departments at HQ. One of the major learning from that operation was obvious for the team: set one project block and stick with it, conduct proper handovers and do not deploy new relief workers for emergency relief. The logistics manager added in the interview the thought of introducing exams for staff in order to increase project quality (K. Hoeve, personal communication, March 2, 2017). However, this raises the question if the IHO can find enough experienced staff.

4.5 Literature Impediments Compared to Process Mapping Impediments

When comparing the impediments from the literature review to those yielded by the process mapping, it is observed that eight out of thirteen can be considered as somewhat similar to the literature findings (check section 3.3.2 or 4.2). The following list attributes the research findings to the literature findings:

- *No communication between ELT, ERT and M&R* deals in some ways with the *organisational structure*, even if it is not about being centralized/decentralized, but rather the *structure of how decisions are made* and the *lines of communication.*
- *Security worries from HQ* were unfounded, so it could be attributed to *HQ does not understand the field.*
- *Roles and responsibility* issues are found in both literature and process mapping.
- *Fear of causing big costs when using satellite communication* could come under the umbrella of *coordination costs,* meaning additional communication costs*.*
- *Adapting numbers* results in *information unreliability* as the organisation cannot trust its numbers.
- *Many different variables* could be attributed to *extreme uncertainty* and *complex environment,* as some of the variables also meant the complexity and insecurity of the environment in Haiti.
- *Staff composition changed constantly* in the literature is *staff turnover (emergency phase).*
- *Inexperienced staff* is the same as *lack of skilled workers* in the literature.

It is interesting to see that more than half of the obstacles are confirmed by literature. This confirms the literature's relevance and actuality. The remaining five impediments seem to be specific to the case of Medair (*time difference, no internet, mindset of inappropriate frugality, many different locations and suppliers, none or different stock reports*).

4.6 Diagnostics and Recommendations

These 13 impediments were diagnosed through the process mapping and discussions with the Medair ERT. The discussions with the ERT, as well as with process experts, yielded recommendations on how to avoid these problems in future. The following figure 4.6 presents on one side the problems observed and diagnoses in the process mapping and the other with discussed recommendations.

Figure 4.6: Diagnostics extracted from process mapping and matched to improvement recommendations.

The next process mapping is adapted, the diagnosed impediments were improved with the above-mentioned recommendations.

4.7 Best-case scenario Haiti

The recommendations from ERT and experts will now be put into practice. Ideally, the Haiti response should have been conducted as shown in the adapted best-case scenario process mapping (figure 4.7). Timewise it is an improvement as the projects are executed more efficiently. The time lag cannot be caught up entirely, but it takes place earlier: the best-case *QIP* starts now on day 12 (planned was day 7), instead of on day 25 (actual process map, figure 4.3.1). The *in-depth assessment and relief program* now starts on time on day 25. Mainly, this difference is caused by a *restructuring of responsibilities* and *clear lines of communication* as well as the installation of *pre-positioning*.

Restructuring the responsibilities in case of an emergency accelerates the decision making process. Instead of two decision meetings, only one meeting is conducted in the adapted process map. The present staff have the respective information from their areas of responsibility at hand. The head of ER can now decide on a basis of facts and figures. Comparing Medair with SKH on this issue, it is discovered that in the GO, the authority lines are clearly defined. It seems this enables faster decisions. Also, the clear roles in the decision meeting help make an informed decision. Medair shows a similar trend: in their evaluation, the team decided to introduce shorter meetings where roles are clearly appointed.

Clear lines of communication come with the installation of clear responsibilities. If the team leader from the ERT knows that he has the last decision on the base location, he will decide quicker and communicate it to his boss at HQ and his team in the field. Or else, if HQ has the last decision, the team leader in the field would directly communicate with HQ and then implement this decision. Whatever way an organisation may decide to go, clear roles and responsibilities implicate clear lines of communication which are assumed to lead to faster decision making and thus implementation of activities.

Pre-positioning "aims to position supplies or other resources at or near places where they are likely to be required" (Oloruntoba & Gray, 2006, p. 117). Pre-positioning is considered to make emergency relief more efficient as the assistance can be delivered at maximum speed and minimum cost (Roopanarine, 2013). Also, this method of procurement brings economic benefit to the communities and builds resilience through a local production (Roopanarine, 2013). It makes the organisation in the field as well as the reporting a lot easier since there is only one supply source. Only the transport vehicles need to be organised in the field. However, putting

pre-positioning in place is challenging because it takes a lot of resources: it needs time for a project team to establish a new concept and large funds to be able to pay for transport and prepositioned relief items. The items will be stored in strategically placed warehouses all year to be ready for the emergency. This requires funds for maintenance, rent and fast transportation. Trainings and manuals need to be adapted to prepare staff for this new approach. Shipping relief items is usually quite slow as it takes a few days to weeks, therefore the first distribution (assess and assist) has to be organised with items procured locally or taken by plane, which is costly too. Even though the mindset of having enough money for emergency response allows for more spending, it is challenging to find a donor who pays for improvements indirectly related to the relief operation, thus an 'advance' for internal process reforms and pre-positioning. This project remains unattractive to donors as no direct reward in terms of children being fed or families sheltered is received, unless the donor takes a longer-term view.

The next figure (4.7) shows the adapted process mapping, where the impediments are taken out and the recommendations are implemented. Thus, figure 4.7 represent an ideal best-case scenario of the emergency response Haiti.

This page is intentionally left blank.

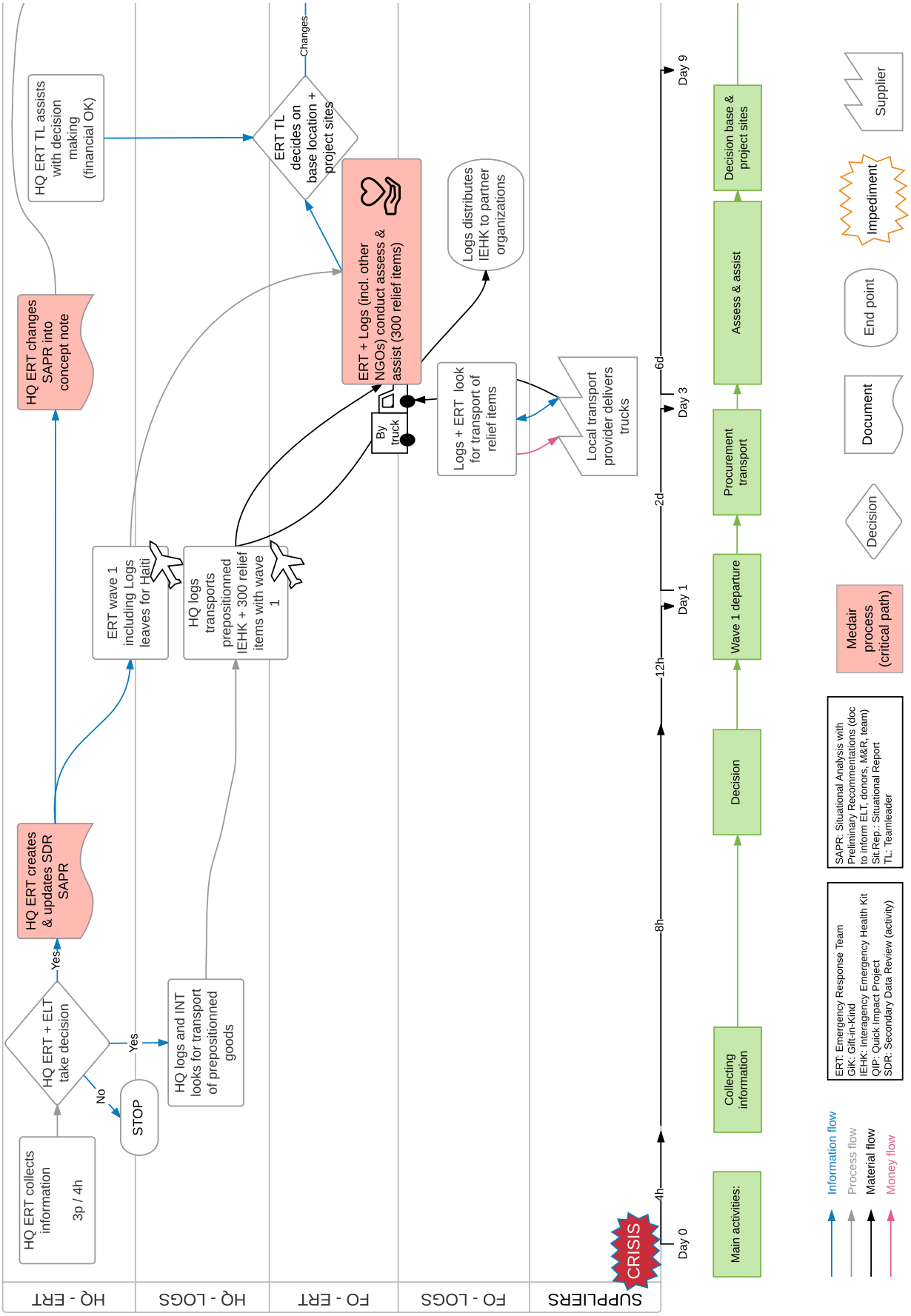


Figure 4.7: Adapted process mapping of emergency response (recommendations implemented) (page 1/2).

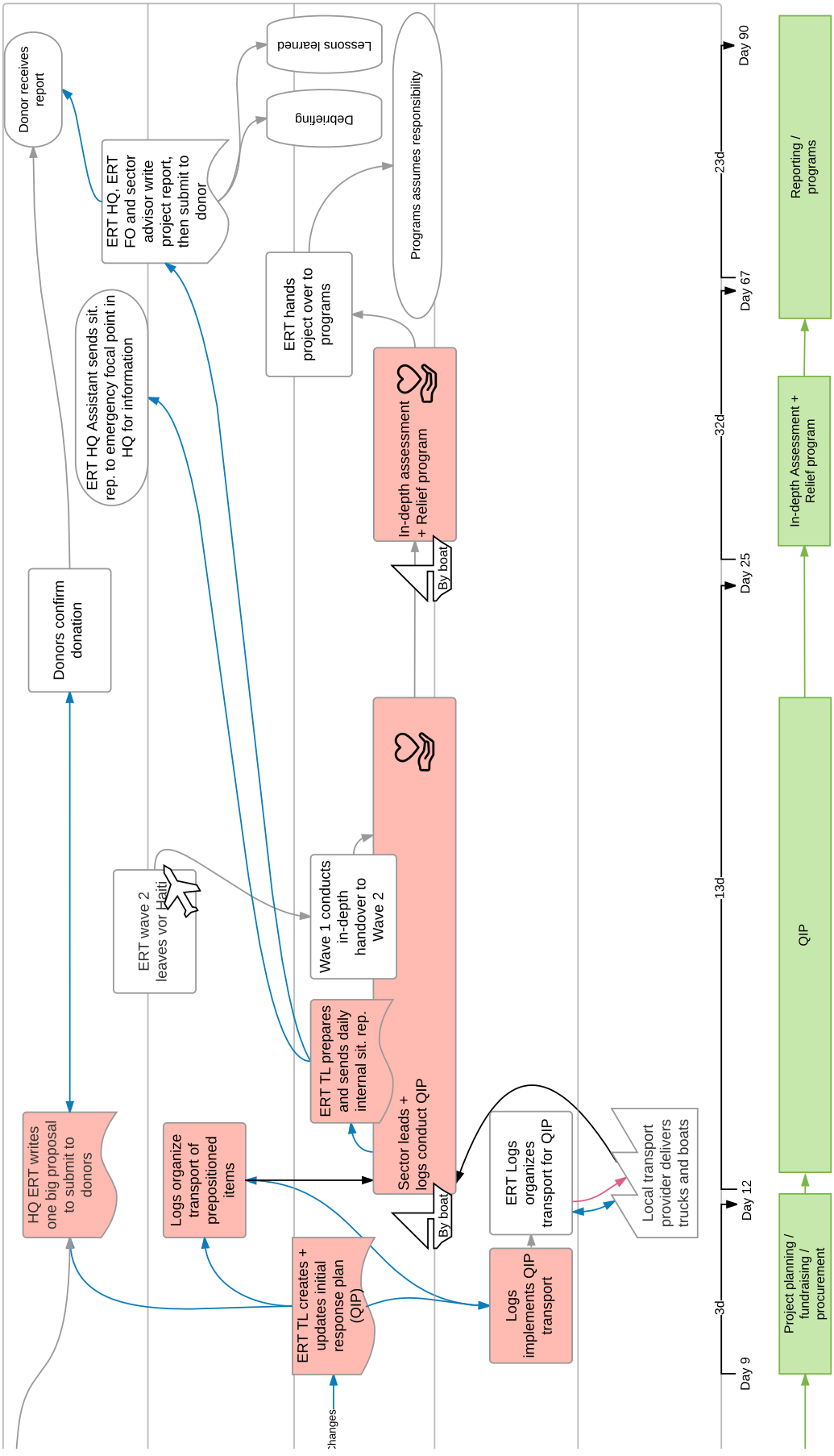


Figure 4.7: Adapted process mapping of emergency response (recommendations implemented) (page 2/2).

4.8 How Should Improvements be Shared?

The interviews and the process mapping provided a broad variety of answers to the question of how improvement ideas shall be shared. Ideas range from factsheets, index cards, a booklet, a smartphone application to trainings and simulations. For definite humanitarian practitioners do not have the time and resources to read nor the space to take with them a thick handbook. An application seems practical, however, if the access to information is bound to internet access or reception, it is not worth much in most ER. A practical suggestion was the combination of a training simulation and a booklet for the field. This organisation has prior positive experience with using simulations as the experience imprints itself in people's memory. A small, clearly structured and visual booklet can help complement this experience. Thus, the thesis will resume the finding in a booklet (section 5.3).

5 Discussion

The results from the interviews, the questionnaire and the process mapping are now systematised and appreciated against the backdrop of the literature. All three parts of the research question are discussed: First, the impediments found in literature are compared to the research findings. Second, the impediments are systematized with the help of a prioritisation matrix in order to crystallise feasible recommendations. Three recommendations are chosen and deductively developed by means of Rosenstiel's (2010) conditions of behaviour. Then, through inductive reasoning, all 13 recommendations are matched to different approaches to improvement. Third, the concept structure of a format is proposed for practitioners to consult when needed.

5.1 What are the Impediments to Information Flow in General?

All impediments to information flow found in the research are now summarized and appreciated on the background of the literature findings. This section is structured using the chapters of the literature review in order to put the impediments into context (emergency relief, humanitarian logistics and information flow).

5.1.1 Impediments to Information Flow in Emergency Relief

The business of emergency relief is marked with **complexity** and uncertainty (Van Wassenhove, 2006; Tatham & Spens, 2011). Day et al. (2009) finds **uncertainty** in terms of demand, supplies and assessment. In the process mapping a clear uncertainty of supplies became apparent. Three different suppliers had to be found as one alone was not able to provide all relief operations. In the questionnaire, five of ten respondents considered complexity as an impediment because there is no infrastructure, too many locations and suppliers and bad security conditions. The communications infrastructure further complicated the flow of information (Tatham & Spens, 2011), as the field team did not have reception and only accessed little data transfer through satellite communications. Van Wassenhove (2006, p. 477) considers the high staff turnover to be a problem as it results in a short supply of skilled workers. This was confirmed in the results gathered through all three research methods. The process mapping showed that the staff turnover especially harmed the operations as many relief operations were conducted by different team leaders, meaning that every new leader first had to gain an understanding of the context before he was able to bring relief. Day et al. (2009), Thakur-Weigold et al. (in press) and Van

Wassenhove (2006) pledge for more efficient relief operations. However, the efficiency mindset is not easily realisable: The Haiti response team had to organise ships in order to reach remote areas, which was probably not the fastest transport. Also, the satellite communication should have been used more to reach beneficiaries faster with help, even though the costs were high. However, because the team was restricted in their ability to spend more money for relief, being efficient in saving lives becomes even more challenging. Also, the **diversity of factors** hinders a clear view of the problem and the combination renders the crisis complex (Van Wassenhove, 2006, p. 478). In the process mapping clearly too many variables was a problem in the Haiti response.

5.1.2 Impediments to Information Flow in Humanitarian Logistics

Other research (e.g. Tatham & Christopher, 2014) has shown that **logistics is not always included in strategic planning** and budgeting, which is confirmed to be a problem in the interviews: If logistics is only a support function, it will never have the possibility to be integrated in all steps and receive appropriate backing from donors along the way. The interview with Medair demonstrated that strategic integration is necessary for project planning because logistics knows best the conditions for procurement and delivery.

The literature states a **decentralized coordination system** enables better decision making when the understanding of local conditions is crucial for the operation (Thakur-Weigold et al., in press; Dolinskaya et al., 2011; Stephenson, 2005; Tatham & Christopher, 2014, p. 22). In the case of Haiti, the understanding of the local conditions was crucial; political disorganisation, security issues as well as searching for suppliers all made the operational context quite complex.

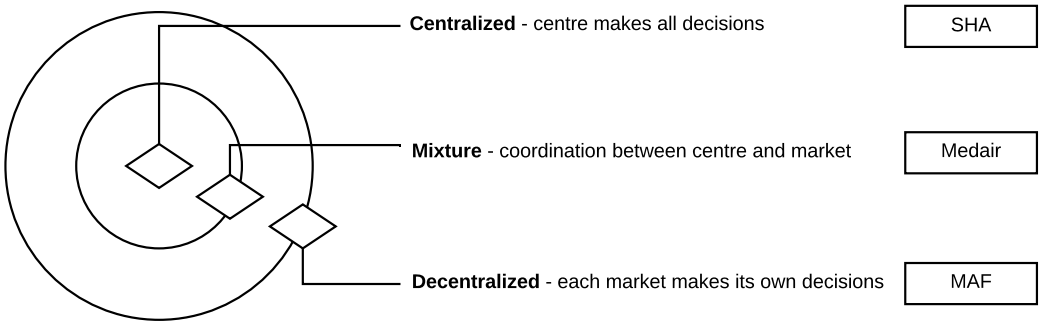


Figure 5.1.2: Decentralized and centralized coordination system.

Decision making in INGO1, INGO2 and the GO can be situated on a continuum where the field teams and HQ have different power (figure 5.1.2). Within INGO1 (Medair), decisions are taken in coordination between HQ and the field team leader. According to Sahin and Robinson. (2002, p.

518f), this model of decision making can be qualified as a mixture between centralized (centre makes all decisions) and decentralized (each market makes its own decision) coordination structure. INGO2 (MAF) delegates as many decisions as possible down the hierarchy, a local approach. The GO (SHA) provides information on the local context to HQ, but the head of ER at HQ is the main decision maker. The question is, would local decision making have accelerated the Medair operation? The HQ back up for the decision on the base and operation locations has generated (also due to the time difference) a time lag. Therefore, a delegation of decision to the field authority might have accelerated the relief distribution by two days. However, HQ is closer to donors and knows the financial information about the size of the project better. It depends on the organisation whether centralized or decentralized coordination is to choose.

Another important impediment is the changing of operational priorities (Day et al., 2012, p. 25), observed in the process mapping. The field team of INGO1 adapted the numbers constantly as the needs continued to increase. Therefore, this impediment was confirmed through experience.

Also, funding is directed towards relief activities and rarely supports internal development (Thomas & Mizushima, 2005, p. 60). The interviewees confirmed this clearly: there is little resource for process development and personal development. However, IHOs should draw the institutional donor's attention to the cost of not including expenses like internal development. NGOs should advocate for resources for internal development from institutional donors and disclose the impact of process development on the efficiency of aid, thereby improving their impact in emergency response.

Technology is developing fast and information management systems are crucial because these can help automatize and share information faster than before. Information sharing systems "alleviate the impact of information impediments of future disasters and lead to an improved flow of resources" (Day et al., 2009, p. 653). The answers from the interviews and from the questionnaire showed a mixed picture: many organisations use some kind of tools or systems, however, inadequate streams, storage misalignment, need for robust equipment, inconsistent format and internet connection are still challenges in the daily humanitarian sector. Larger organisations own an overall IM system for internal as well as external coordination. However, interviewees from middle-sized IHOs voiced aspirations for an organisation-wide information sharing system. Smaller organisations do not have the funds to install information management (IM) systems featuring dashboards for the management as well as co-working functions for coordination between HQ and FO in projects.

5.1.3 Impediments to Information Sharing

Reindorp and Wiles (2001), Akhtar et al. (2012) and Sahin and Robinson (2002) claim that good information sharing is a prerequisite for good coordination. The process mapping shows that the timely exchange of information was crucial for project development. The **time difference** between Haiti and Switzerland was experienced as being a challenge and disabled the communication of crucial change in time. The bullwhip effect, observed by Forrester (1958) also contributes to that: the natural tendency to amplify numbers was observed in the process mapping; the project team adapted the numbers constantly due to new information. This caused confusion at HQ in finance and fundraising as the changes were not traceable and they still had to communicate the budget increase to donors. The project team on the field did not understand the consequences their actions triggered in the finance and fundraising team at HQ. Additionally, waiting for the funding approval and no internet connection contributed to the bullwhip effect leading to the large time lag.

The quality of the **organisational structure** within large organisations rarely seemed to be a problem. In the questionnaire, the logistics officer from the ICRC selected all of the organisational structure-related impediments as appearing "rarely". Also, the emergency response manager from the GO marked none of these as impeding "often". Both statements speak for a good structure at large organisations. However, the subject of internal structure may be delicate when communicating it to external researchers. Therefore, stating 'the larger the organisation, the better the organisational structure' could be biased and needs further analysis.

Impediments related to staff need some explanation at this point. It is important to notice that three out of four impediments classified as happening 'often' by half or more of the respondents are concerned with *staff turnover (generally* and *in the emergency phase)* or *lack of skills*. Turnover is extremely high in this field (eight out of ten state this was "often" an impediment). Literature confirms this (Thakur-Weigold et al., in press; Van Wassenhove, 2006). Akhtar et al. (2012, p. 98) observes a lack skilled workers such as trained operational staff and logistics managers, amongst others. The results from the research show that for rapid-onset disasters such as Haiti, skilled staff were not available in every organisation, even though it is crucial to have them. One idea for improvement is taking no more newcomers for rapid-onset disasters. However, skilled staff also need to receive the possibility to develop their skills in order to become experienced. Therefore, the recommendation is to assure a good mix of experienced and new relief workers. Due to the inexperience and the rapid handovers, many team leaders in INGO1 used different distribution forms (therefore different data was collected), which complicated

reporting. In the past years, many useful checklists have been established to contribute to successful operations (e.g. The Sphere Project (2011) standards and checklists, internal procurement and distribution checklists etc.). However, the introduction of checklists requires intensive training. Every IHO works with checklists, even if the degree of standardisation of theses varies. In order to improve skills, the recommendation from one of the interviewees of Medair was to improve training and set exams for reassurance of good quality. This is done by SHA already, operating on a much larger budget than Medair. Other ideas consider targeted recruitment or a need to investment and "grow your own staff".

The next section takes the recommendations for improvement of the above mentioned impediments and discusses the improvements.

5.2 How can Information Flow be Improved?

The recommendations for Medair, identified during the process mapping and the reflection afterwards, have the potential to avoid or reduce the impact of some impediments and thereby improve information flow. Section 4.6 mentions all 13 recommendations. This chapter systematises the recommendations and prioritises in order to elaborate three in more detail. These three recommendations are tailored to be applied in Medair.

5.2.1 Prioritise Recommendations

By means of a prioritisation matrix, the recommendations from the process mapping are prioritised and selected for individual elaboration. In order to prepare all 13 recommendations for prioritisation, the following scoring shows how the input and output weight was calculated by the researcher (table 5.2.1a). The two axes define the categorisation:

INPUT: How much effort has to be inserted to put this recommendation in practice? Three criteria are used to qualify the input: How many resources are needed, to which degree is a strategic decision needed and how urgent is the implementation of this recommendation?

OUTPUT: To what degree does this recommendation improve information flow if put in practice in an organisation?

Criteria	*Quantifier*	1. Define clear lines of communication	2. Define power of decisions in emergencies	3. Clear roles and responsibilities	4. Modification with explanatory statement	5. Set and stick to one block of project	6. Knowing & communicating that emergencies always well financed	7. Smaller response	8. Reduce variables	9. Pre-positioning	10. Send one big proposal to donors	11. Prolong handover time	12. Standardise forms	13. Training and exams
Resources needed (material + staff)	2	3	1	4	3	1	1	3	5	5	4	1	3	5
Strategic decisions needed	3	1	5	5	1	1	5	3	5	5	1	1	1	3
Urgency	1	2	2	3	3	5	4	2	5	3	2	1	4	4
INPUT	**max. 30**	**11**	**19**	**26**	**12**	**10**	**21**	**17**	**30**	**28**	**13**	**6**	**13**	**23**
Improvement of information flow	3	5	5	5	5	5	5	3	1	4	5	5	4	4
OUTPUT	**max. 15**	**15**	**15**	**15**	**15**	**15**	**15**	**9**	**3**	**12**	**15**	**15**	**12**	**12**
Size of project	1-5	3	2	3	4	2	2	2	5	5	3	2	2	3
Notes: 1-Weak importance; 2-Moderate importance; 3-Strong importance; 4-Very strong importance; 5-Extreme importance														

Table 5.2.1a: Calculation of input and output for each recommendation.

The criteria were created by the researcher. By means of this scoring, the recommendations are allocated into the subsequent prioritisation matrix.

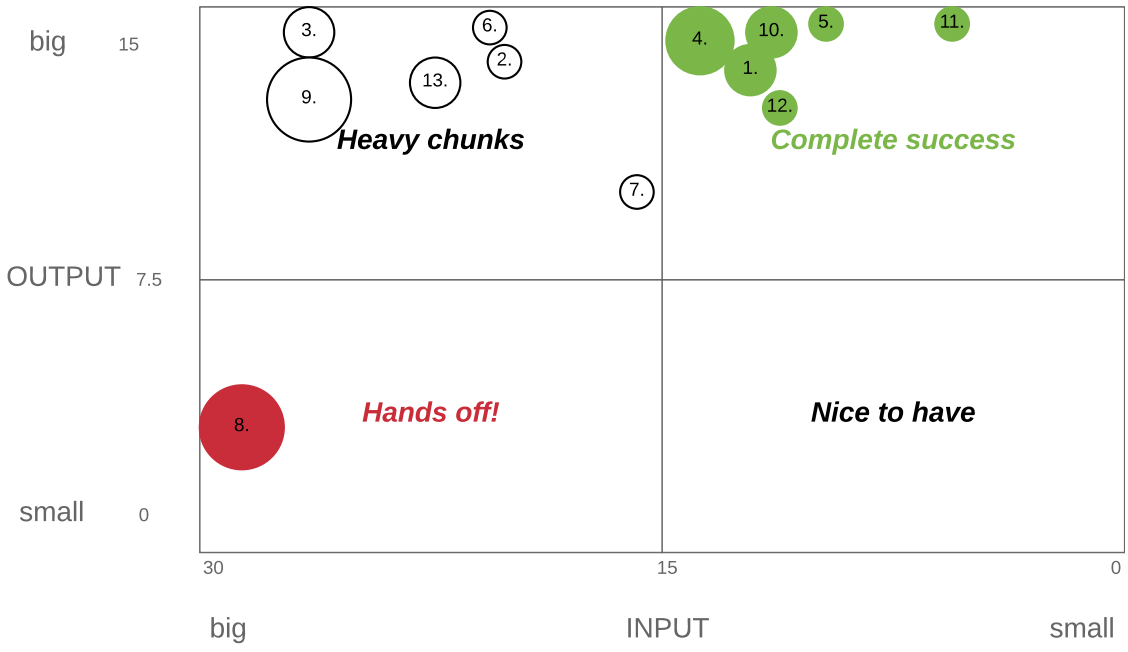


Figure 5.2.1: The prioritisation matrix classifies recommendations according to input and output.

This prioritisation matrix, a management tool for systematising decisions, is used and adapted by the researcher for situating the recommendations. The goal of prioritisation is to know which recommendation is most suitable to be implemented (where is the biggest output and a relatively small input).

On observation, the majority of the recommendations are either *heavy chunks*, needing a lot of input to realise this recommendation but the output is equally big, or *complete successes* with small input and a big output. From all recommendations, three topics are chosen for elaboration, on the basis of feasibility regarding the limits of this thesis. The three following improvement suggestions are situated in the *complete success* square: **standardise forms** (12), **define clear lines of communication** (1) and **modification with explanatory statement** (4). In order to know the approach of intervention for each recommendation, the condition for its realisation needs to be understood; Who has the decisive lever and what kind of activities are requested for its implementation? Rosenstiel (2010) asks four questions (whenever a staff's behaviour does not meet the expectations), which are adapted to the recommendations and complemented with the condition of the behaviour and the approach of intervention (based on A. Angerer, personal communication, March 15, 2017) (table 5.2.1b).

ROSENSTIEL (2010, p. 347)	ADAPTED TO RECOMMENDATIONS	CONDITION OF BEHAVIOUR	APPROACH OF INTERVENTION
Was he not able to do it?	Is the staff able to implement this alone?	Individual skills (ability)	➡ Training
Did he not want to do it?	Does the implementation depend on the will of the staff?	Individual desire (volition)	➡ Difficult to influence. Maybe partly HR-incentives
Was he not allowed to do it?	Does the implementation require a strategic decision from higher level?	Empowerment and obligation	➡ Management induces change
Did he not have the necessary resources or were there impeding barriers?	Does the implementation depend on the situation?	Situational enabling	➡ Difficult to influence

Table 5.2.1b: Questions to ask for categorization (development based on Rosenstiel, 2010).

The questions from table 5.2.1b were asked for each aforementioned recommendation in order to be able to categorize them in the following table. The arrows show the possible approach for intervention in this condition. Some recommendations are allocated to two or three conditions because both or all three approaches of intervention are needed for the implementation of this recommendation.

Empowerment and obligation (➡*Management*) 1. Define clear lines of communication 2. Define power of decisions in emergencies 3. Clear roles and responsibilities 6. Knowing & communicating that emergencies always well financed 9. Pre-positioning 11. Prolong handover time 13. Training and Exams	**Individual desire** (➡*Difficult to handle*) 1. Define clear lines of communication 4. Modification with explanatory statement 11. Prolong handover time
Situational enabling (➡*Difficult to change*) 8. Reduce variables 11. Prolong handover time	**Individual skills** (➡*Training*) 4. Modification with explanatory statement 5. Set and stick to one block of project 7. Smaller response 10. Send one big proposal to donors 12. Standardise forms 13. Training and Exams
Notes: Colours according to the prioritisation matrix: Red-*Hands off!*; Green-*Complete Success.* Underlined green-Chosen recommendations for elaboration.	

Table 5.2.1c: Recommendations arranged in the four conditions of behaviour (Rosenstiel, 2010, p. 348).

Most recommendations can be found in the conditions *empowerment and obligation* and *individual skills*. In order to boost *individual skills*, staff need training. In order to implement recommendations in terms of *empowerment and obligation*, the management decides on strategies, regulations and concepts and thereby defines new ways of (inter)action. Training or change induced by management are two feasible options, compared to the options for *situational enabling* or *individual desire* where the room for manoeuvre is rather small and difficult to handle.

Three recommendations are now drawn out and elaborated in detail for Medair'. This includes how the recommendation solves the problem matched, how it can be implemented (with the help of Rosenstiel's model) and in which way it improves information flow. When implementing change, it is essential to take into account the eight critical success factors of Kotter (1995) for a fundamental change.

5.2.2 Standardise Forms

How does standardising forms solve the problem of different stock reports? One problem of INGO1's operation in Haiti was the constantly different stock reports which every new response team leader used. Team leaders did not know which hygiene kits they were distributing as they had three suppliers in fifteen remote locations. The stock reports often did not contain any signature or even only a fingerprint from the beneficiary such that tracking down became very complicated. This turned reporting into disorder; HQ logistics officers could not specify which supplier delivered which hygiene kit to which beneficiary group. However, institutional donors

require exact data about distribution of relief items (where, what, to whom, why). The team recommended the use of standardised forms. A standardisation would resolve in uniform reports and facilitate team work as these contain all necessary information. Standardisation in this case would facilitate reporting from field to HQ as well as reporting to donors. The development of standard forms would mean incorporating all required information from the departments involved – logistics, finance and human resources. The standardised form with user guide could have the positive side effect of creating that understanding between departments, a central element mentioned in several interviews and in the mapping.

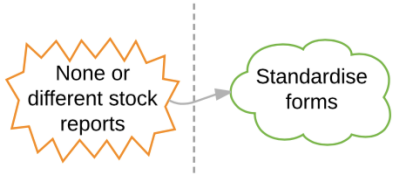


Figure 5.2.2: Diagnostic associated to the recommendation to standardise forms.

How can standardising forms be implemented? Developing a distribution report or a stock report for warehouses for the emergency response team could be a start. This will not need a strategic decision from top management, however, a sector advisor and the head or manager of the concerned department will need to agree and support the initiative. First, a template should be developed which includes the information from all departments needed. A distribution reporting sheet contains all necessary information and operates as piece of acknowledgment for different departments (examples can be found at UNHCR, 1997, p. 63). Second, the introduction to relevant staff across the whole organisation should be planned; a guideline explaining the different lines of content for a common understanding would be beneficial. Additionally, the forms would be introduced to the basic staff training of the organisation. In order to transfer the knowledge, the trainer can adhere to Rosenstiel's principles conducive to transfer (Rosenstiel, Molt & Rütiger, 2005, S. 412) such as simulating a distribution where the form is used.

In which way does standardised forms improve information flow?

- Standardised forms contain all necessary information, no double inquiry needed
- Facilitates reporting to HQ and to donors
- Better team work and a common understanding between departments facilitates information flow

5.2.3 Define Clear Lines of Communication

How do clear lines of communication solve the problems of security issues and time difference? The definition of clear lines of communication could be attributed to Rosenstiel's condition of

empowerment and obligation. The management has the decision power to define and enforce lines of reporting and communication. When the lines are clear, it is also the task of the staff to communicate according to these lines. In Medair, the communication lines seemed not always to be clear. Problems came up when security worries from HQ and the time difference complicated communication. First, the security worries from HQ proved unfounded as they had no local knowledge. If the communication line was clear and only from one person to the team leader (TL) in the field, these concerns could have been cleared up in the first communication. Second, the

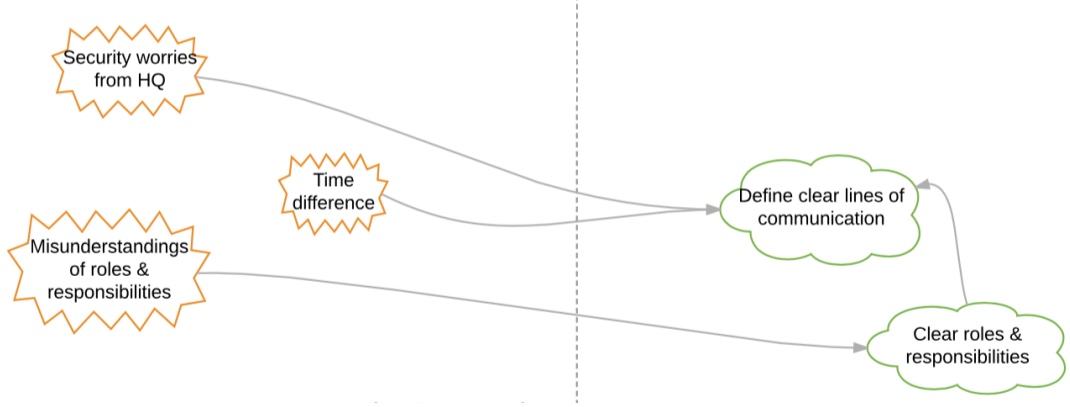


Figure 5.2.3: Diagnostics associated to the recommendation clear lines of communication.

time difference impeded timely information flow from HQ to the field and vice versa. If clear lines of communication had been installed, a clear idea of when the new decisions needed to be communicated to the field TL in order to reach him on time before the start of the working day, could have prevented many delays. Also, the need of HQ staff adapting temporarily their working hours to minimise time difference shall be considered. Clear roles and responsibilities need to support clear lines of communication as they presuppose each other. In the occasion of misunderstandings, HQ anticipated the field team leader's decision, while he only required an appreciation of the situation from HQ. The team leader needed an HQ estimation to take the decision in the field. Due to the back and forth in the communication, the decision making on the base spot and distribution locations took too long (three days). Interviews confirmed that the final decision maker should be clearly defined. Is the final decision maker in the field or at HQ and for which decisions is this the case? Clear roles and responsibilities in turn induce clear lines of communication because the competencies are clarified. The interview with the governmental organisation showed that their communication concept specified clear communication lines and a clear hierarchy. This appeared to be an evident advantage for their efficient operation.

How can clear lines of communication be implemented? This recommendation can only be implemented with a convinced and strong management. The assignment for a concept of clear lines of communication will be decided by the leadership to have a direct effect on the

organisational structure and responsible heads of departments. The assignment may be combined with the clarification of roles and responsibilities. However, a redefinition of roles and responsibilities could enlarge the project to a large-scale restructuring. Every head of department will have to be involved if the restructuring is done organisation-wide. An appointed project leader and his team for the project of redefinition of roles and responsibilities and lines of communication be from the department where the project is implemented (for example ERT). Once the new concept of the restructuring is established, the project team needs to decide in which ways the new lines of communication will be communicated to other departments as well as temporary staff and staff working in the field. Incorporation in the emergency team training and guidelines is a must. Otherwise, information sessions throughout the next few months can be planned and internal information channels shall be used.

In which way do clear lines of communication improve information flow?

- The responsible person knows the direct way the information goes.
- It optimizes procedures and minimises confusions.
- It accelerates information ways and the team increases its agility to react.

5.2.4 Modification with Explanatory Statement

How does modification with explanatory statement solve the problem of constantly changing numbers? The process mapping with Medair yielded the fact that the field staff constantly adapted numbers of project needs in Haiti. This caused confusion in the HQ emergency team, dropping down to logistics as well (and possibly further down to other departments). Decisions had to be redone at HQ, which caused disorder and inefficient operations. This redoing and inefficiency consumes resources that could be used for direct project cost. If at the root, field staff had to submit an explanatory statement whenever they change a number, this would be an additional hurdle to take. The explanatory statement could include a structured reasoning to the people down the line who would have to deal with this information furthermore. Thus, field staff

Figure 5.2.4a: Diagnostic associated to the recommendation modification with explanatory statement.

would change the numbers less, and if they changed it, an explanation will go with it, providing the people down the line with additional information providing context about the change.

How can modification with explanatory statement be implemented? A structured reasoning could figure as an additional hurdle. One explanatory communication method is ISBAR. In the medical sector, estimations attribute the major factor in 60-70% of serious incidents to failures in communication (Finnigan, Marshall and Flanagan, 2010, p. 2). ISBAR was developed as a feasible and effective approach and is "likely to result in improved communication in the clinical environment" (Finnigan et al., 2010, p.2). ISBAR (view figure 5.2.4b) could be adapted and applied to the humanitarian sector. The communication scheme helps to communicate changes in a clear, structured and explanatory way. If we talk about information that needs to go from the field back to HQ, this scheme helps clearly formulate changes and their corresponding background. Imagine a situation where a field assessment officer wants to change stock orders because the last assessment yielded detailed results about a region with more needs which was not anticipated before. This person will then need to communicate his identity, situation, background, assessment and request in written or oral form to his counterpart at HQ in order to give solid reasoning for changing numbers.

ISBAR For Clear Communication	
I	IDENTIFY: Yourself (name, position, location) & beneficiary group
S	SITUATION: Why are you calling (if urgent -say so), what is the
B	BACKGROUND: Tell the story
A	ASSESSMENT: What you think is going on
R	REQUEST: What you want from them

Figure 5.2.4b: ISBAR model (Marshall, Harrison and Flanagan, 2012, p. 2) adapted to the humanitarian context ("patient" replaced by "beneficiary group").

The HQ then is aware of the change and its context, and therefore able to act upon this change. In order to implement such a communication system, the concerned department, in our case the ERT, would start as a first pilot unit. The model could be inserted in the field handbook and included in training. Rosenstiel's principle conducive to transfer (Rosenstiel et al., 2005, S. 412) of repeating of the learned content (here the ISBAR model) will further the learning process. In Rosenstiel's dimensions, it needs individual skills and desire to implement and utilise such a new system. It could be described like a checklist. If ISBAR is successful, the organisational management can think of other departments where this could be of use.

In which way can the modification with explanatory statement improve information flow? When field and HQ communicate the modification of stock and assessment numbers in a structured way, instead of simply change and not document the reason for the modification, the explanatory information is transferred instead of getting lost. The ERT at HQ can react upon and comprehend the change, instead of being faced with a fait accompli. One side effect is a potential decline in the number of changes due to the related effort that has to be made. Information therefore flows directly from the field to HQ and can be processed in the different departments (e.g. modification of proposals and communication to donors).

This deductive reasoning started with Rosenstiel's proposed condition of behaviour for each recommendation and described how the recommendation can be implemented in Medair and how it improves information flow.

5.2.5 Generalising approaches to improvement

After these three recommendations were elaborated for the specific case of this middle-sized IHO, a generalisation shall be ventured. Table 5.2.5 broadens the view and looks inductively at all other recommendations not yet discussed in depth and questions if the approaches of interventions can be applied to other recommendations. This derivation of general principles from the three specific observations remains a probable suggestion. Table 5.2.5 seeks to provide

RECOMMENDATION	APPROACH OF INTERVENTION				
	Management	Training	Standardisation	ISBAR	Introduce technology
1. Define clear lines of communication	■		▒		
2. Define power of decisions in emergencies	▒		▒		
3. Clear roles and responsibilities	▒		▒		▒
4. Modification with explanatory statement		■		■	
5. Set and stick to one block of project		▒	▒		
6. Knowing & communicating that sudden-onset emergencies always well financed	▒		▒		
7. Smaller response		▒	▒		
8. Reduce variables		▒	▒	▒	
9. Pre-positioning	▒		▒		
10. Send one big proposal to donors	▒	▒	▒		
11. Prolong handover time	▒	▒	▒		
12. Standardise forms		■	■		▒
13. Training and exams	▒	▒	▒		

Notes: **black**-used approach in three elaborated examples; grey-this approach could be tested.

Table 5.2.5: Recommendations and further approaches to improvement.

ideas for implementations of recommendations which were not elaborated. A combination of approaches of intervention could be beneficial. The testing of these approaches will be the task of future research.

5.3 Booklet

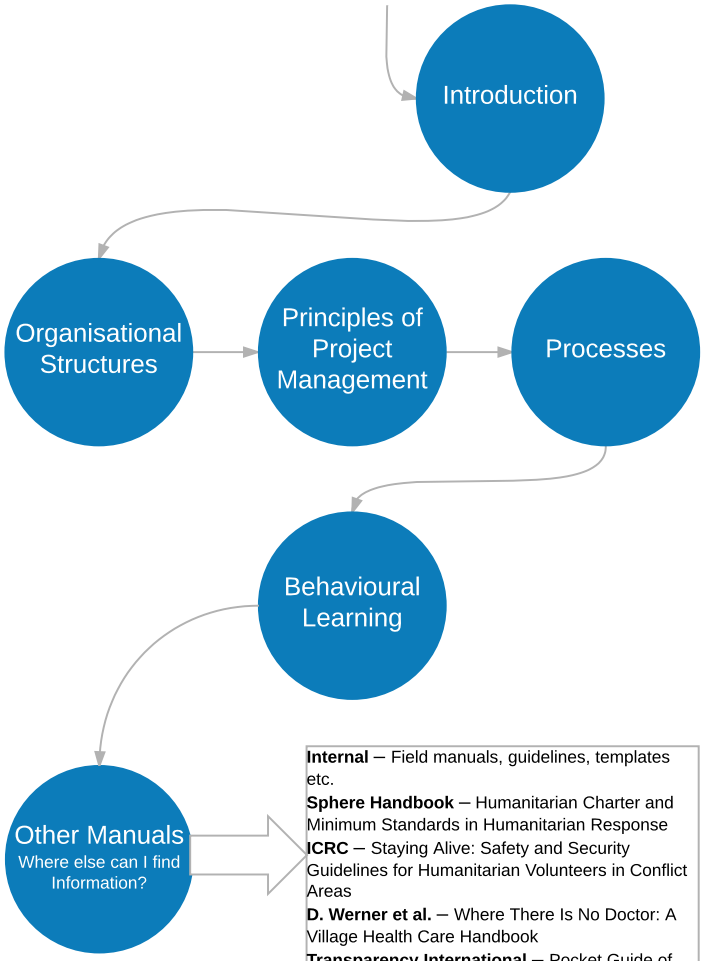
In order to make information flow tangible and the recommendations applicable, a format containing the aforementioned recommendations is proposed. It summarises literature learnings and findings from the research. The purpose is to make applicable models and principles available in a concise way, such that practitioners are able to quickly consult it and adapt the principles for their work environment to improve information flow locally. The content shall be adapted to the particular organisation, so that best practise cases and internal structures (not being found in handbooks, checklists or guidelines) can be integrated. Interviews yielded very different results when asking about the type of format. Some prefer a booklet, others training, others a smartphone application. However, if there is no reception or battery, the content should be manually available. A booklet seems to be the most practical as it can be taken on person and the content can be read in a short amount of time.

Introduction to the booklet shall be done in trainings to lead to the desired outcome, the practical use of the booklet in the field. Training in IHOs has effectively led to learning (Thakur-Weigold, in press). The topic of information flow should be established in one of the introduction sessions to the organisation. The participants need to experience the significant impact of their information sharing on their directly related support functions, on material flows as well as on the overall efficiency of the organisation. For example, the training session could be composed of a field-like situation where the participants encounter several impediments and they are asked to solve the problems. After the simulation, discussions on the impact, the communication lines as well as the teamwork could be added for a deeper understanding.

The booklet is simply structured and clearly visualized to enable a quick overview. The following three pages are a proposition of the most important subjects concerning information flow. Yet, the bullet points remain only an indication of an important subject and have to be established by the INGO for their specific end use.

Booklet for Improving Information Flow in Humanitarian Operations

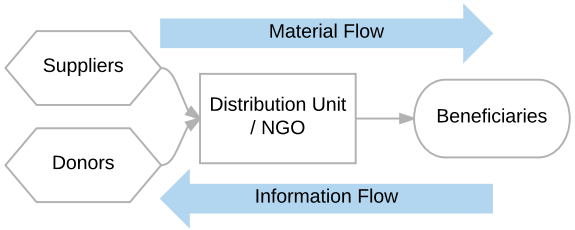
Between Field Offices and Headquarters



What is information flow and why is it important?

Introduction

Information flow represents order transmission and order tracking, which coordinate the physical flows.



Definition of disaster

A serious disruption of the functioning of a community or a society causing widespread human, material, economic or environmental losses which exceed the ability of the affected community or society to cope using its own resources" (Reliefweb, 2008, p. 22).

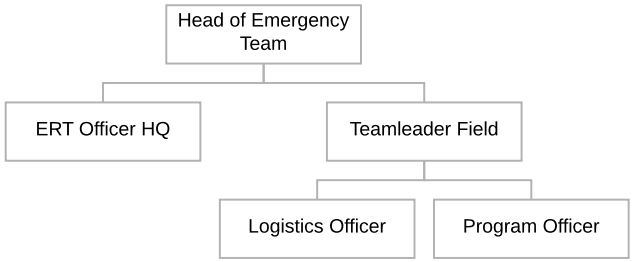
	Natural	Man-made
Sudden-onset	Earthquake Hurricane Tornadoes	Terrorist Attack Coup d'Etat Chemical leak
Slow-onset	Famine Drought Poverty	Political Crisis Refugee Crisis

Different kinds of disasters (Van Wassenhove, 2006, p. 476).

Organisational Structures

Who decides and who communicates with whom?

- Organisational chart and clear lines of communication (Emergency Response Team)



- Power of decision
- Clear roles and responsibilities
- Job descriptions
- Training and exams plan

Principles of Project Management

Which principles facilitate my project management?

- Know the fundraising successes of rapid-onset disasters vs. slow onset disasters
- Reflect carefully on the size of the response, and adapt to your capacities

- Pre-positioning can facilitate procurement
- Send one big proposal to donors
- Standardize templates
- Team organisation through regular teammeetings, teambord, standing huddle meetings etc.

Processes

Which processes help improve project organisation and information flow?

- Define and stick to one block of project (no random adaptation of numbers)
- Information management and documentation / Folder Structure / Daily report structures etc. - Daily report could look like list on the left
- Adaptation by explanatory statement - use ISBAR

Situation
Security
Results
Requests
Next steps
Security
Contacts to Media / other NGOs
Miscellaneous

ISBAR For Clear Communication	
I	IDENTIFY: Yourself (name, position, location) & beneficiary group
S	SITUATION: Why are you calling (if urgent -say so), what is the
B	BACKGROUND: Tell the story
A	ASSESSMENT: What you think is going on
R	REQUEST: What you want from them

Source: Marshall et al., 2012, p.2 (adapted)

What can I learn in terms of behavioural systems?

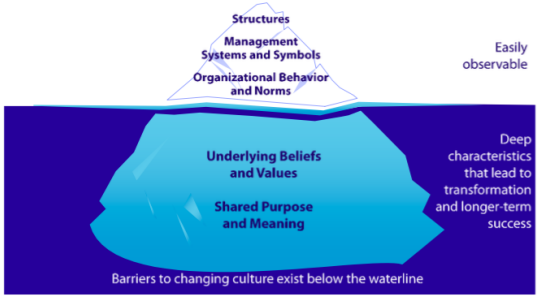
Behavioural Learning

- Reduce variables in an emergency (e.g. install pre-positioning, reduce size of operation, take more experienced staff with you etc.)
- Be situationally aware and use improvisation
- Prolong handover time
- Logstics and warehouse management

  - Install opening hours
  - Introduce stock cards and labelling of shelfs
  - Use four eyes principle
  - Start central document filing (cloud or intranet)
  - Store correctly fast moving goods and slow seller
  - Install an assembly and packing job for bigger projects

  An RFID / Scanning technology system has several advantages (non-exhaustive)
  - Stock report
  - Inventory
  - Expiry date of medicines etc. and related information when new items need to be purchased

- The challenge of culture change

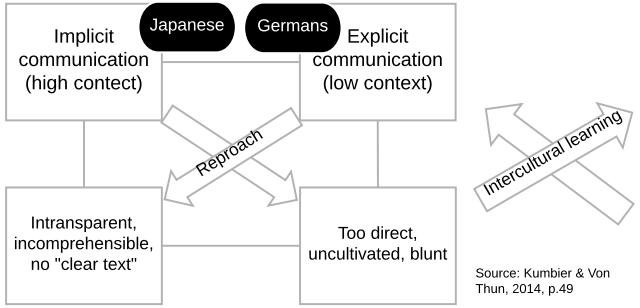


Source: www.haygroup.com

- Teamwork: the Team Management System shows your work preferences and thereby simplifies collaboration.

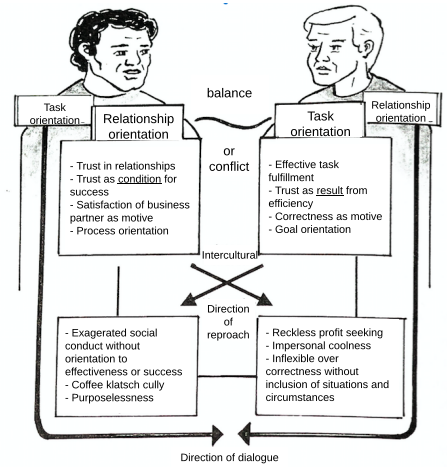
Source: www.tmsworldwide.com

- Intercultural communications guidelines
- Culture square on implicit and explicit communication



Source: Kumbier & Von Thun, 2014, p.49

- Relationship and task orientation in the value square



Source: Kumbier & Von Thun, 2014, p. 298

6 Conclusion and Implications

This thesis attempted to introduce readers to the opportunities and importance of information flow in disaster response. It sought to identify what makes information flow different. It has explored why research into information flow is timely, necessary and needed. When information flow in disaster response is studied, not only understanding, but also development, of a broader and richer understanding of supply chains is reached. Studying humanitarian disaster relief supply chains and information flows provides opportunities to improve processes.

This section resumes the answer to the research question, points out limitations, clarifies implications for practitioners and theory, names general learnings and gives an outlook on further research topics.

6.1 Answer to the Research Question

Through interviews, questionnaire and process mapping, this thesis aimed to answer the question of what kind of impediments to information flow exist, how it can be improved and how this knowledge shall be shared.

First, **impediments to information flow** are numerous and can be categorized in three different areas: In emergency relief, complexity, uncertainty and the diversity of factors are found to be situational impedient circumstances. Regarding humanitarian logistics, the non-strategic position of logistics, centralized coordination systems, changing of operational priorities, limited funding for internal development and the inaccessibility to all-encompassing IM systems for smaller organisations impede information flow. Regarding information sharing, the time difference, the high staff turnover and limited technical skills are considered to be obstacles.

Secondly, the **recommendations to improve information flow** from the process mapping point out the potential of technical and behavioural skills trainings as well as the power of change induced from the management. To start, the assumption is that skills trainings result in more experienced staff and therefore improve information flow. The trainings include teaching technical as well as behavioural communication skills to transfer the right information at the right time to the right people. Next, change induced by the management has the power to regulate areas such as decision power, clear roles and responsibility and strategic decisions influencing the

general framework of fundamental conditions in the relief operation (e.g. pre-positioning; goods no longer have to be procured in the field, but are shipped from the prepositioned location).

Finall, these improvement recommendations shall be shared through a booklet, due to limitations in phone reception and electricity. The booklet shall be adapted to the relevant organisation and introduced in trainings. The integration into a cloud collaboration service, intranet or a smartphone application are other options, however, the content must be available also offline.

The hypothesis can be confirmed: The improved process mapping showed a more efficient quick impact project through the restructuring of responsibilities and communication as well as the installation of pre-positioning. It can therefore be said that process improvement fosters information flow and contributes to more efficiency in humanitarian operations.

6.2 Limitations of Research

This research aspired to combine humanitarian logistics and process management tools in order to find out how the process of information flow can be improved. General research included five INGOs and one GO. The deeper case study with Medair investigated the flow of information in the first ten weeks of the Matthew response, in emergency and logistic teams between HQ and the field office. Other INGOs and the GO were not analysed as intensively as Medair due to timely limitations. The behaviour of people was analysed only in terms of the condition for the implementation of recommendations in order to know how the intervention shall be approached (Rosenstiel 2010 model). However, the question of how people share information and why could not be analysed. The thesis only slightly touched information management, thus not being in the focus. The difficulty consisted in the application of the vague definition of information flow. It was seen as an aspect of information management and the delimitation was done in regards to time (ten first weeks) and exchange between specific functions (HQ and FO, logistics and project information).

6.3 Implications for Practitioners and Theory

Generally valid, it can be said that good management is a condition to regulate information flow in emergency relief. Additionally, technical and behavioural skills trainings are a prerequisite for experienced workers in operations and therefore improve information flow. A discovery is that many impediments to information flow can be mitigated or alleviated by managerial decisions

and project management tools such as trainings. Only a small portion of impediments caused by situational circumstances cannot be influenced simply. However, the improvement recommendations within the conditions of *empowerment and obligation, individual skills* and *individual desire* can be influenced to enable a better flow of information. It is therefore encouraging that organisations have the power to change conditions themselves, enabling their staff to work with better communication tools in a complex environment. Some of the ideas on how to improve information flow can be found in the booklet intended for practitioners (section 5.3).

Regarding theory, this paper contributes to the body of knowledge specifically on information flow. It exclusively focused on information flow within INGOs. The thesis validates certain impediments to information flow and provides some scientific improvement suggestions through its practical approach.

6.4 General Learnings

In literature, we find a considerable emphasis on the relationship between information flow improvement and the efficiency and performance of supply chains. However, a concept on information flow and by what it is influenced seems to be vaguely defined. It could be said that the method how IF can be improved appears to be left to practitioners, namely the concerned teams in those organisations.

The organisation involved in the process mapping was motivated to learn from the interaction. During the meeting, several evaluations and learnings from the Haiti response were mentioned. Later on, the results from the mapping were of interest for quality improvement. Hence, the process mapping meeting contributed to the reflection process on how to improve emergency relief in general.

6.5 Further Research

The findings are a considerable gain, pointing out specific areas of intervention to improve information flows and thereby foster efficiency in emergency relief operations. The topic needs further development: Research demand exists in terms of concept definition of information flow and testing of the proposed approaches. It is known that improved information flow advances material flow and this paper established suggestions of approaches to the improvement of IF.

However, the findings remain to be validated: Does improved IF really result in better organisational performance? At the same time, concept development in terms of what is good organisational performance in humanitarian relief, is of extended value. Possibly a case study examining performance of an organisation in which logistics is a strategic function can be compared to a case where logistics is only a support function. Through this study, the influence of the position of logistics upon performance could be tested. Other extended topics like information management systems in emergency relief would be valuable to investigate. Potentially, this can be done through a case study with the analysis of two similar organisations.

«Process improvement is not a destination. It is a journey without end. With this feature, it is similar to the work of brave humanitarians, trying to make a difference. They work in a chaotic, dangerous, volatile world; a world without end. Amen.»

Tatham and Christopher, 2014, p. 34

7 Bibliography

Ahmed, A. (2016). Hurricane Matthew Pummels Haiti and Moves Toward U.S. *The New York Times*. Oct. 4, 2016. [online available on: https://www.nytimes.com/2016/10/05/world/americas/hurricane-matthew-caribbean.html?_r=0]

Akhtar, P., Marr, N.E., Garnevska, E.V. (2012). Coordination in humanitarian relief chains: Chain coordinators. *Journal of humanitarian logistics and supply chain management*, 2(1), p. 85-103.

A. Angerer (2017, March, 15). Personal communication.

Anand, K., Mendelson, H. (1997). Information and Organisation for Horizontal Multimarket Coordination. *Management Science*, 43(12), p. 1609-1627.

Balcik, B., Beamon, B.M., Krejci, C.C., Muramatsu, K.M., Ramirez, M. (2010). Coordination in humanitarian relief chains: Practices, challenges and opportunities. *International Journal of Production Economies*, 126(1), p. 22-34.

Bartell, A.L., Lappenbusch, S., Kemp, R.B., Haselkorn, M. (2006, October). *Improving Humanitarian Relief Information and Communication Systems through Research.* Paper on the panel discussion on the occasion of the IEEE International Professional Communication Conference, Oct. 2006, p. 156-162.

Brinkmann, S. (2013). *Qualitative Interviewing*. New York: Oxford University Press.

Day, J. M., Junglas, I., Leiser, S. (2009). Information flow impediments in Disaster Relief Supply Shains. *Journal of the Association for Information Systems*, 10(8), p. 637-660.

Day, J.M., Melnyk, S.A., Larson, P.D., Davis, E.W., Whybark, D.C. (2012). Humanitarian and disaster relief supply chains: A matter of life and death. *Journal of Supply Chain Management*, 48.2, 2012(4), p. 21-35.

Detlor, B. (2010). Information Management. International Journal of Information Management, 30.2, 2010 (4), p. 103-108. DOI: 10.1016/j.ijinfomgt.2009.12.001

Finnigan, M.A., Marshall, S.D., Flanagan, B.T. (2010). Case Study ISBAR for clear communication: one hospital's experience spreading the message. *Australian Health Review*, 34(4), Nov 2010, p. 1-8. DOI: 10.1071/AH09823

Forrester, J.W. (1958). Industrial Dynamics: a major breakthrough for decision makers. *Harvard business Review*, July-August 1958, p. 37-66.

Hashmi, K. (2017). Introduction and Implementation of Total Quality Management (TQM). [Online available on: https://www.isixsigma.com/methodology/total-quality-management-tqm/introduction-and-implementation-total-quality-management-tqm/]

Hoeve, K. (2017, March, 2). Personal Interview.

International Council of Voluntary Agencies (2017). The Grand Bargain: Everything you need to know (February 2017). [Online available on:

http://www.agendaforhumanity.org/sites/default/files/The%20Grand%20Bargain_Everything%20You%20Need%20to%20Know%20%28ICVA%29_0.pdf]

Jörimann, F. (2017, April, 25). Personal Interview.

Kelly, C. (1995). A framework for improving operational effectiveness and cost-efficiency in emergency planning and response. *Disaster Prevention and Management*, 4(3), p. 25-31.

Kotter, J.P. (1995). Leading Change. Why transformation efforts fail. *Harvard Business Review*, 73 (2), p. 59–67 (March/April 1995).

Kumbier, D., Schulz von Thun, F. (Hg.) (2014). *Interkulturelle Kommunikation: Methoden, Modelle, Beispiele*. 7. Auflage. Reinbek bei Hamburg: Rowolt Taschenbuch Verlag.

Lee, H.L., So, K.C., Tang, C.S. (2000). The Value of Information Sharing in a Two-Level Supply Chain. *Management Science*, 46(5) (May, 2000), p. 626-643.

Maiers, C., Reynolds, M. and Haselkorn, M. (2005). *Challenges to effective information and communication systems in humanitarian relief organisations*. Conference publication, proceedings of the IEEE International Professional Communications Conference, PCC 2005, p. 82-91.

Marshall, S.D., Harrison, J.C., Flanagan, B.T. (2012). Telephone referral education, and evidence of retention and transfer after six-months. *BMC Medical Education* 2012 12:38.

Ministry of Foreign Affairs of Denmark (2017). *Humanitarian Organisations*. [Online available on: http://um.dk/en/danida-en/partners/humanitarian-organisations]

Oloruntoba, R., Gray, R. (2006). Humanitarian aid: an agile supply chain?. *Supply Chain Management: An International Journal*, 11(2), p.115-120. DOI: 10.1108/13598540610652492

Parris, A. (2013). Improving processes for good in East Africa. *The TQM Journal*, 25(5), p. 458-472. [online available on: http://dx.doi.org/10.1108/TQM-11-2012-0101]

Parris, A. (2017, April, 24). Personal communication.

Reindorp, N., Wiles, P. (2001). Humanitarian Coordination: Lessons from Recent Field Experience. A Study commissioned by the office for the Coordination of Humanitarian Affairs (OCHA). Overseas Development Institute, London.

Reliefweb (2008). *Glossary of Humanitarian Terms*. [Online available on: http://reliefweb.int/sites/reliefweb.int/files/resources/4F99A3C28EC37D0EC12574A4002E89B4-reliefweb_aug2008.pdf]

Reliefweb (2016). *Haiti: Hurricane Matthew Situation Report No. 12*. October 2016. [online available on: http://reliefweb.int/sites/reliefweb.int/files/resources/Sitrep_Template_EN_0.pdf]

Roopanarine, L. (2013). How pre-positioning can make emergency relief more effective. *The Guardian*. 17.01.2013. [online available on: https://www.theguardian.com/global-

development-professionals-network/2013/jan/17/prepositioning-emergency-relief-work]

Rosenstiel, L.v. (2010). Employee Behavior in Organizations: On the Current State of Research. *Management Revue*, 22(4), p. 344-366.

Rosenstiel, L.v., Molt, W., Rütiger, B. (2005). *Organisationspsychologie*. [Online available on: https://content-select.com/media/lgcy_viewer/517a532c-420c-4580-bf71-1b855dbbeaba]

Rosenstiel, L. v., Nerdinger, F.W. (2011). Grundlagen und Bezugsdisziplinen der Arbeits- und Organisationspsychologie. In: H. Schuler & K. Sonntag (eds.), Handbuch der Arbeits- und Organisationspsychologie (p. 15-26). Göttingen: Hogrefe.

Rother, M., Shook, J. (1999). *Learning to See: Value Stream Mapping to Add Value and Eliminate Muda*. Brookline: Lean Enterprise Institute. ISBN 0-9667843-0-8.

Sahin, F., Robinson, E.P. (2002). Flow Coordination and Information Sharing in Supply Chains: Review, Implications and Directions for Future Research. *Decision Sciences*, 33(4), p. 505-536.

Schuppener, J. (2017, February). *Internationales Team*. Seminar im Rahmen der Coachingausbildung Interkultureller Coach. Schuppener Global Transitions, Korntal: AWM.

Stephenson, M.Jr. (2005). Making Humanitarian Relief Network More Effective: Operational Coordination, Trust and Sense Making. *Disaster*, 29(4), p. 337-350.

Tatham, P., Christopher, M. (2014). Humanitarian logistics: meeting the challenge of preparing for and responding to disasters. London: Kogan Page.

Tatham, P., Spens, K. (2011). Towards a humanitarian logistics knowledge management system. *Disaster Prevention and Management: An International Journal*, 20(1), p. 6-26.

Team Management System (2017). *The Team Management Profile - At a glance.* [online available on: http://www.tmsdi.com/team-management-profile]

Thakur-Weigold, M., Stumpf, J., Wagner, S.M. (2015). Helping the Helpers, Adaptive training combats silo behaviour and communication breakdowns that bedevil humanitarian supply chains. *Industrial Engineer*, Dec 2015. [Online available on: http://www.iise.org/IndustrialEngineer/Issue.aspx?IssueMonth=12&IssueYear=2015]

Thakur-Weigold, B. (2017, April, 24). Personal communication.

Thakur-Weigold, B., Besiou, M., Wagner, S.M. (in press). Change Management in humanitarian Operations. *Journal of Operations Management*, in press.

The Sphere Project (2011). *Humanitarian Charter and Minimum Standards in Humanitarian Response*. Third edition 2011. Hampshire: Hobbs the Printers. ISBN 978-1-908176-00-4.

Thomas, A., Mizushima, M. (2005). Logistics training: necessity or luxury? *Forced Migration Review*, 01 January 2005(22), p.60.

United Nations General Assembly (1991). *Strengthening of the coordination of humanitarian emergency assistance of the United Nations*. A/RES/46/182. 78th plenary meeting, Distr. GENERAL, 19 December 1991. [Online available on: http://www.un.org/documents/ga/res/46/a46r182.htm]

UNHCR United Nations High Commissioner for Refugees (1997). Commodity Distribution: A Practical Guide for Field Staff. *UNHCR Division of Operational Support*, June 1997. [Online available on: http://www.unhcr.org/3c4d44554.pdf]

UNOCHA United Nations Office for the Coordination of Humanitarian Affairs (2012). OCHA on Message: Humanitarian Principles. June 2012. [Online available on: https://docs.unocha.org/sites/dms/Documents/OOM-humanitarianprinciples_eng_June12.pdf]

Van Wassenhove, L. N. (2006). Humanitarian aid logistics. Supply chain management in high gear. *Journal of the Operational Research Society*, 57(5), p. 475–489.

Wagner, S. M., Thakur-Weigold, B., Stumpf, J. (2013). A New Approach to Applying Commercial Knowledge to Humanitarian Challenges: Teaching Supply Chain Efficiency in the Field. *Logistics Innovation*, 2013(2), p. 30-33.

Wilson, T. D. (2003). Information management. *International encyclopedia of information and library science*. London, UK: Routledge., p. 263–278.

8 Appendix

8.1 Hurricane Matthew Route Map

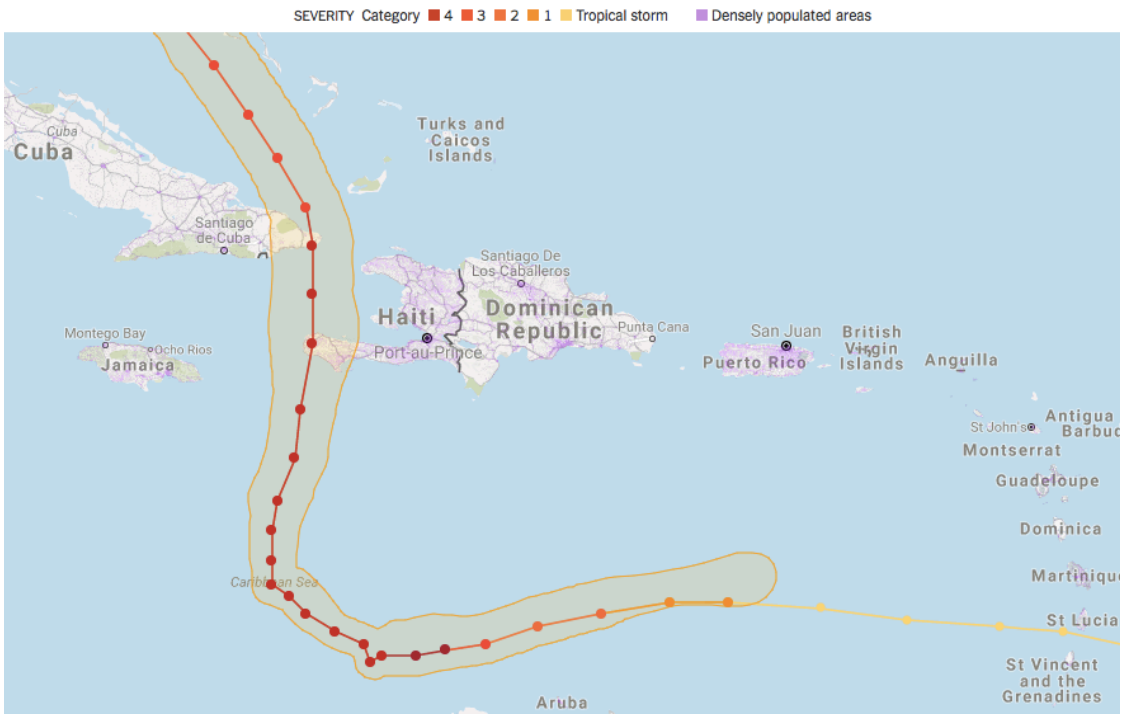


Figure 8.1: Hurricane Matthew Route Map (Ahmed, 2016)

8.2 Impediments Categorised into Conditions of Behaviour

Empowerment and obligation	Individual desire
○ Inaccessibility ○ Cultural conflicts ○ Source identification difficulty ○ Unreliability ○ HQ does not understand the field ○ Online system not being used much & data in online system is not up to date ○ Low information priority ○ Storage media misalignment ○ Not everyone is in the information loop ○ Overworked staff & not time for IS ○ Coordination costs ○ Inconsistent data and information formats ○ Roles and responsibilities are not clear ○ Need to standardise ○ Lack of sense of ownership for decisions	○ High staff turnover ○ Cultural conflicts ○ Info access depends on interpersonal relationships ○ HQ does not understand the field ○ Online system not being used much & Data in online system is not up to date ○ Not everyone is in the information loop
Situational enabling	**Individual skills**
○ Urgent responsiveness ○ Extreme uncertainty ○ Short supply chain life-cycle ○ Inadequate stream of information ○ Complex environment ○ Many stakeholders & demands of donor accountability and transparency ○ Low information priority ○ Storage media misalignment	○ Lack of skilled logistics worker ○ Cultural conflicts ○ Source identification difficulty ○ Inadequate stream of information ○ HQ does not understand the field ○ Online system not being used much & Data in online system is not up to date ○ Lack of process knowledge ○ Not everyone is in the information loop ○ Overworked staff & not time for IS ○ Coordination costs

8.3 Experts Overview Table

Organisation (during ERO)	Medair (Interview)	Medair (Interview)	Medair	Medair	Medair	Medair
Job title	International Logistics Manager HQ	Warehouse Manager Regional hub Juba	Head of Global Emergency Response	Emergency Response Team Assistant	Logistics Officer	Communications & Information Management Officer
Work experience	9 years	2 years	15 years	2 years	5 years	1.5y hum., 4y Int. Dev.
Formal level of education	Master (Eqivalent)		Master	Master	Bachelor in humanitarian logistics	Bachelor
Disaster-Mng related education		No	FEMA Emergency Management Institute diploma	No	Logistics response Tean training from the Logistics Cluster	Humanitarian Core Competancies Certificate from Humanitarian U, including disaster management modules
Specific IM system at your Org?	No	No	No	No	Portfolio (programs), Box (sharing documents), Qlik View (report and visualize data)	Developing new tools of info collection (mobile data collection, GIS mapping, visual dashboards and consistent communication from country mngt. Different IM systems in differing stages of dev..
Relief Operation	Haiti Oct 2016	SDS 2015	Haiti Oct 2016	Haiti Oct 2016	Haiti Oct 2016	Central Highlands, Afghanistan - Massive wheat crop losses
Function	Logistics Manager		Emergency Response Team Leader	Emergency Response Team Assistant, in charge of information management and internal communication	Logistics Officer, in charge of supplying the goods to the disaster area (temporary base)	Information Management Officer/Interim Project Manager
HQ or FO	HQ	FO	Field	HQ	Field	Field
Counterpart	Logistics Manager Field	Not often contact to HQ	Head of Global Emergency Response	No direct counterpart, mainly supporting the Head of Emergency Responses. An Information Management Officer was my counterpart in FO for a few months.	International Logistics Manager HQ	Head of Country Programme, Logs + Fin Officer, and IM Manager for digital data collection (IM pilot)

Organisation (during ERO)	ICRC	MAF	MAF	SDC (SHA)	(n/a)	SRK / Caritas
Job title	Deputy Log Coordinator	Disaster Response Manager	Global Disaster Response Deputy Manager	Programme Officer Rapid Resonse	Project Manager	Program Coordinator (NPL Earthquake and Ukraine, SRK)
Work experience	3 years	22 years	16 years	12 years	4 years	7 years
Formal level of education	Master	Master	Master	Master	Master	Master
Disaster-Mng related education	No	Crisis Management	On the job training	-	-	PM diplomas and certificates, Leadership trainings, specific mngt fields trainings (fin, security, HR, controlling etc.)
Specific IM system at your Org?	Lotus Note - IBM	no	no	DMS Datamanagement System for archiving	corporate driver, SAGA (project management tool, incl. finances)	Navision/Betriebsdat enerfassung for finance-related info, sharepoint /oneDrive for documents
Relief Operation	Unity State, South Sudan / Nov 2016 / Emergency Food Distribution	Nepal Earthquake 2015	Haiti Oct 2016	Haiti Oct 2016	Mardin, Turkey, Sept2015	Haiyan PHL Nov 2013
Function	Log Delegate - Warehouse and Planning	Initial Response Project Manager	Disaster Response Manager	Chief of staff at the crisis cell	Programme Manager	Disaster Response Delegate
HQ or FO	Delegation (Field HQ)	Field	Field	HQ	Field	Field (first 5 months), then HQ
Counterpart	Head of Sub Delegation	Response Manager and Admin Support Officer	Global Disaster Response Manager and Lead Disater Response Administrator	No direct oral communication to FO (but btw. Head of crisis cel and Team Leader of relief team)	Chief of Operations	Program Coordinator

8.4 Interview Results Table

Questions in the interview		Medair Logistics Manager HQ (HQ, ongoing and rapid response) Skype Interview	Medair Warehouse Manager South Sudan (ongoing emergency) Questions sent via email, Skype interview for clarification
Organizational structure	Structure	Emergency and recovery Budget: 60 Mio **Matrix organizations with support functions** (Fin, HR, Logs, IT) Logistics comprises seven areas (Procurement, stock mngt, transport, travel, equipment tracking, fleet tracking and facilities) and is a linkage to programs and all support functions, fits into the overall PM. **We hire people without much experience and puts them in a responsible role.** Training takes therefore much time (matrix organisation, donor requirements, project mngt etc.)	Training before field: 1w orientation course (behaviour) + 4d log, procurement etc. introduction As Warehouse mngr, I was not involved in much communication to HQ. However, managing 1200 different itemas and 5 reporting staff complicated the task. Standard processes had do be re-implemented in the first 3-4 months (Stock Report, Receipt of Goods, Journal). Hierarchy: Country Director -> Deputy country Director -> Logistics Manager -> Supply Chain Manager -> Warehouse Manager (me) -> Warehouse Assistances only CD talks to HQ Head of country program, others talk to their support function at HQ if needed
	Assessment	HQ: receiving information with different platforms such as Virtual OSOCC, logs Cluster, internal information Manager FO: assessment combined with assisting, through one team 1w	
	Procurement		Often not many suppliers to choose from. All the time we had delays.
	Readyness for change	IT is always behind. But in ERT, people find their way around it. Secure data lines are costly and too slow. **Limiting factor is mainly money,** then technical capacity.	smoothly, step by step after the involvement of several stakeholder. Explain improvements and encourage staff and capacity building
Communication	Communication	Skype, Emails, Whatsapp, Meetings, phone calls (usually with the field->report by HQ log). Field decides when and if. EMR: skilled log will discuss about operational logistics, if cross-covering other roles also these roles (Staffing, schedules, organizing, GiK etc.) Ongoing: follow-up and recommendations Humanitarian individuals: "humanitarians are like water. They will always try to make things work, but they will try to take the shortcut. Even if you have a process in place or you agreed to do something in a certain way, they will decide to do things whichever way is the quickest and the easiest. good for reacting quickly, but loosing on the structural side. e.g. agreement on pull-system, but then everyone changes to a push-system (In the heat of the moment people go in and push things out, a soap instead of a blanket). / forget reporting back"	Through email, intranet, personal, meetings. In SDS, training is not self-evident/self-responsibly
	IM systems and tools	Excel for actual transactions (procurement) / **Excel & Portfolio** for reporting and tracking However, this is just an empty box, Excel can meet the needs of logs, but not of the entire organization. A overall tool with dashboards for managers would be helpful. => *We would need* ***a tool which links all that*** *(e.g. when entering an information, the system realizes this impacts someone else as well)*	No IM system. Only Excel. Essential information from HQ is shared. *=> More trust about individual skills would be helpful and timesaving.*
	Checklists, handbooks, guidelines	**Checklists are good, but they require a lot of training.** Because we work with temporaries, this is not possible.	Quick reference cards, internal process docs, books and self-produced checklists were very helpful.
People	Trainings	one week Briefing at HQ, within that two days to train people on logistics. Important that they understand Logs is a function that needs to be involved everywhere along the project cycle (even before starting to think of a project), from project design to donor reports. **not enough time for training -> lack of skilled workers**	
	Meetings	1/d in first two to three weeks, then every other day, twice a week, once per week dropping down to once a month, also depends on the logs mngr in the field. It's possible that this person covers two or more functions (finances, communications etc.)	Emails, intranet, docs on servers, personal meetings, regular group (every second week) and mngt meetings
	Team work	Temporary staff: little accountability, sometimes less experienced. - Simplification might not always work (stressed, insecure, tired people) => *Repetition and score* would be helpful	if local staff are initiative and have good networks, speak the language, they can be key for work Structured thinking is very different CH to SDS, however CH structure also helped the locals. Not sure what still remains though. **Sometimes log knowhow was not there, but the cultural understanding.** However, everyone needs to show flexibility.
	Stakeholder		Sharing information with Management, staff, subcontractor, suppliers, field locations, program managers, other international colleagues

Complexity of emergency relief	Information sharing impediments	Encountered problems: when communication tools don't work, too much is going on, time difference, experience & Knowledge of people, not knowing what is relevant for the field/HQ to know, who to contact in a certain situation, excitement involves everyone **(too many people on the table),** information overload. *=> information management role was added to distribute information* *=> standing meeting will be introduced with only necessary functions* Security: Concern is usually about beneficiary data, but not on information exchange between HQ and FO	No structure nor processes (e.g.Stock cards got lost). Visits from mng and logs advisors helped to install processes step by step *=> install opening hours (+communicate it to procurement), trainings* *=> install stock cards, push for keeping up the processes* *=> 4 eyes principle* *=> Layout warehouse and document structure* Complexity: "PHL: corruption, nepotism, thefts, insecurity (traffic), unfavourable contracts, landlord rights, SDS: insecurity, thefts, governmental bureaucracy, military movements, looting of Organisation's property, MedEvac, staff absence caused by illness, insecure roads, cancelled flight due to many reasons (weather, insecurity, governmental regulations), labour mafia, political volatility sometimes made work impossible" *=> need to be flexible and improvise*
	Improvement ideas	**=> Clear roles and responsibilities, clear processes, clear PM procedures, regular trainings, tests, clear career development, easy to use tools, more measurements of what we are doing, management skills** **=> a cloud system is only a tool,** it needs to be thought through (who needs what info, how to put it in so that it makes sense for everyone) => find out how to work best **across-functions** as we are a matrix organisation.	=>install **opening hours** (+communicate it to procurement), trainings => install **stock cards,** push for keeping up the processes => **4 eyes principle** => **Layout warehouse and document structure** **=> on- and offline Cloud system** **=>** best would be a system where **every article has its code and number linked to a easy-to-handle system** **=> More time in HQ with logs and IT staff** **=> staff training, capacity building** (also in computer systems, tracking system) **=> control implementation, sanctions** if procedures get lost
In which format should these improvement ideas be packed into?			
	Learning methods	_(MLogs) Well structured **Factsheets in a booklet** _(MERT) In a **training,** I found out that there is a **huge diversity on how people learn.** I was surprised that everyone learns very differently; some want to read, others needed to do it, others solely listened to the powerpoint. ERT: in the process of doing. Triplex simulation. Not real life, but **simulations** were best.	**Ask staff or line-manager, cellphone call, email, download from internet, discussions in meetings**
	Format	**Combination of cloud and app** (online and offline) would be useful. where you can store a lot of information, guidelines, Quick reference cards, processes etc.. A printed handbook does not work anymore, Quick reference cards are useful and checklists also good to have. _(MLogs) **Quick Reference Cards** (internal) very useful - but some procedures are skipped in emergencies. ERT is working on an **emergency handbook** - an integration of these findings could be useful. Booklet would be the most useful: II (our logs used MSF guidelines for distribution) **Apps: depends really on technology, too many apps on a phone, needs internet.** _(MERT) **Simulations** (Beer game was good) and secondly a small booklet (very concise, eventually with case studies)	**Mixture of different e-documents** (pdf, word, video-clips, podcasts, audio) **on a cloud** / intranet which is easy to use (drag and drop) Content: Best practices, quick links or checklists could help Book would be too thick

Questions in the interview		MAF Disaster Response Manager (rapid onset) Phone and email conversations (two respondents)	DEZA - SKH Fachstelle Rapid Response (rapid onset) Personal interview
Organizational structure	Structure		Rapid Response Fachstelle deckt alle Nothilfe ab, auch Afrika. KMZ: Krisenmanagement Zentrum: kümmert sich um alle Schweizer im Katastrophengebiet. Soforthilfe-Budget: 500 Mio pro Jahr, 2% des DEZA Gesamtbudgets. 1/3 an IKRIK, 1/3 UNHCR, 1/3 eigene Response SKH Mitglieder (RRT): 650 P., jede Funktion mind. 5 mal vertreten, um immer verfügbare Experten bereit zu haben. Chef HH Manuel Bessler ist wärend einer RR für zwei Monate direkt dem Bundesrat unterstellt (keine DEZA-Zwischenstufe dazwischen), also direkte Entscheidungskraft (ob RR oder nicht) Involvement of local embassy is always crucial, it is a cooperation between RRT and embassy, HQ CH decides. -> Struktur hilft sehr
	Assessment		Feld: werden grob und community-based durchgeführt. Verteilungen ans ganze Dorf (wenn auch an Reiche), da keine Zeit für Details, und das Verteilen an alle ist wichtig für die Sicherheit.
	Procurement		Haiti: Einkauf war sehr **schwierig, da keine Zulieferer,** darum über Dom.Rep. Früher hatte man 3 Flieger mit Material gefüllt (heute immer noch möglich, einfach teuer und kommt später an). Prepositioning ist grosses Thema
	Readyness for change		
Communication	Communication	MAF DR Mngr: Verantwortung vom Project Manager der DR. Bei DFID sind wir schon preaprouved, müssen also nicht mehr grundsätzliche Prozesse erklären. Man fragt DFID an wenn sie vor Ort sind, reicht ein schlankes Projektproposal ein und in der Regel funktioniert dies sehr gut. Das Reporting funktioniert relativ einfach: Die Leistung wird in geflogenen Stunden berechnet (X Flugstunden für X Geld), plus Kostenaufstellung. Falls wir effizienter arbeiten, fliegen wir mehr für dieses Geld.	From HQ to FO, **only Head of crisis cell and Teamleader of relief team exchange information** (Sit.rep. And debriefing sheets). **Wichtig: TL Feld zusammenarbeit mit Botschafter Feld!** Entscheidungsablauf: **RR Concept defines clear lines of communication:** 1. Vor RR (Decision to go): Piketdienst -> Entscheidung ob Einsatzleitung formiert wird zw. Piket, Chef HH, geografischer Chef -> SMS an 22 Pers. (Haiti) -> Einsatzleitung formiert 2. Während RR: Einsatzleiter CH entscheidet, weil Geld aus der CH gesprochen wird. nur TL Feld kommuniziert mit HQ. Meistens nickt Einsatzleiter CH Entscheidungen ab. Konsens muss bereits am Anfang mit der Botschaft getroffen werden, da diese nach 2 Monaten Programm übernehmen. Bei den Trainings ist die Sensibilisierung auf die Kommunikation mit den Botschaften wichtig. Feld Manual erklärt Hierarchien und Job Descriptions. Lessons Learnt nach Evaluation werden integriert (working document)
	IM systems and tools	Working via email across multiple time zones slows the communication process / Moving large picture or video files via email difficult due to server limitations on file sizes / file share utilities such as drop-box, take time & speed is limited by bandwidth and local internet connectivity. Pre-paid phones for local comms, have limitations on international connectivity & data transfer. Costs of BGAN, sat phones and international phone calls, though not a large impediment (needs to be managed). GATR or VSAT units require specialist technicians to set-up + cost and delay, but allow greater freedom of IF. Biggest need is to get info to fundraisers ASAP, often with detail and human interest stories, often it's the Response Manager (takes a lot of time & energy away from managing the response actions)	Datanmanagemens System for archiving (DMS): Informationsablage für jegliche Kommunikation. HQ legt ab, Feld schreibt Sit.Reps und speichert auf lokalem Server.
	Checklists, handbooks, guidelines	MAF DR Mngr: Wir sind Aviatiker, wir operieren mit Checklisten und sind schnell bereit, uns daran zu halten. Dies ist in unseren Genen, wir würden keine Abkürzungen nehmen (wie vielleicht humanitäres Personal). Die Prozesse zu formalisieren hilft uns.	Field manual beschreibt Hierarchie, Job describtions etc. Evaluationen werden nach dem Einsatz integiert (Working document)
People	Trainings		26 Trainings pro Jahr (Keine Briefing-Zeit vor Einsätzen)
	Meetings		Kommunikation (hängt auch von den Personen ab): Telefon 1-2/d, sit.rep: 1/d
	Team work		Decision making: **RR Concept defines clear lines of communication. Head of response HQ decides with information from TL field** Depending on emergency, getting information from Erdbebendienst ZH, different int. Services, embassies etc.. Circumstances and Construction of houses determines if USAR is set to go or not required to be there 48h after emergency).
	Stakeholder	MAF DR Mngr: Es gelten verschiedene Prinzipien: First come, first served, strategische Partner werden auch beachtet, und die **dringendsten Hilfsgüter zuerst.** Reporting: MAF DR Mngr: Verantwortung vom Project Manager der DR. Bei DFID sind wir schon preaprouved, müssen also nicht mehr grundsätzliche Prozesse erklären. Man fragt DFID an wenn sie vor Ort sind, reicht ein schlankes Projektproposal ein und in der Regel funktioniert dies sehr gut. Das Reporting funktioniert relativ einfach: Die Leistung wird in geflogenen Stunden berechnet (X Flugstunden für X Geld), plus Kostenaufstellung. Falls wir effizienter arbeiten, fliegen wir mehr für dieses Geld.	DEZA hat **grosses Aussennetz** (Botschaften, Schweizer NGOs, Fernseh, etc.), worauf das RRT zurückgreifen kann. Zugang zum Land ist eine politische Einladungsfrage (erschwert zum Teil). Drei Rollen: die offizielle Schweiz, Responders, Donors) **Mandatsklärung ist wichtig:** Botschaft hat anderes Mandat und Interessen wie das RRT (bzgl. Regionen, politischer Einfluss etc. RRT hilft wo die Not am grössten ist). Als Verantwortlicher Einsatzleitung mache ich oft zusammen mit KMZ Trainings und wir informieren die Botschaften zusammen über unsere Aktivitäten und arbeiten Scenarios aus. Zuständigkeiten erklären

Complexity of emergency relief	Information sharing impediments		Inaccessibility of information: Schwierig, da RRT nur durch BGAN Daten transferieren konnte (keine Antennen) -> nur kleine Datenmengen konnten transportiert werden. **"Catastrophies are very different, one to the other is not comparable.** The Philippines (supplier next door) cannot be compared to Haiti (no suppliers) Je nachdem wie das **Zwischenmenschliche** funktioniert, hängt vieles davon ab."
	Improvement ideas	=> Aim at mobilising GATR or VSAT units early with appropriate technical staff - **not loosing time is priority to wasting a plane ticket** (DR concept) => Sending pics and videos on storage sticks with travelling staff => **Use BGAN units and allocate communication costs in a funding application** => **Employ media specialists to gather stories, relieving the response manager.**	
In which format should these improvement ideas be packed into?			
	Learning methods		
	Format		Content should be shared in form of a **training. Fachübergreifende** Trainings sind zentral. We integrate learnings from evaluations directly in the **field manual** already. 2016, we developped two new trainings on assessments, 2017 an NFI (assessment to procurement) training

8.5 Questionnaire Grid

School of Management and Law

Questionnaire

Information flow in humanitarian operations

General information

ZHAW MSc Business Administration – Major Nonprofit and Public Management.
Master thesis of Andrea Rominger (rudinan2@students.zhaw.ch)

Background of study

This study analyses information flow between Headquarters and field office in emergency relief operations. It aims to find out what the impediments to information flow are and how these can be improved. This questionnaire helps to verify impediments found in other studies and recent literature.

Confidentiality

All personal information given will be kept confidential. Only your function and organization will be mentioned, your Name will not appear. Your statements will not be linked to your organization or function. If you wish that your function shall not be mentioned as well, please let me know.

Practical things

All Participants receive a final copy of the paper in July (2017). The completion of the questionnaire will take around 15 minutes. Practical descriptions and concrete examples of situations are helpful.

Part 1: Personal Information

(1) What is your job title?
(2) How many years of work experience do you have in humanitarian operations?
(3) What is your formal level of education (e.g. Bachelor degree, Master degree)?
(4) Do you have any disaster-management related education? If yes, please specify:
(5) Does your organization use a specific information management system? If yes, please specify:

In order to fill in the following table, it is essential to have one specific emergency relief operation in mind. Try to answer the questions looking only at the first two weeks of the disaster. Please choose a relief operation:

- *Which you can recall well*
- *Where you were actively involved the first two weeks of the disaster*
- *Where you were either at Headquarters communicating with the field, or part of the emergency relief team communicating back to Headquarters.*

(1) Which emergency relief operation are you thinking of? Location and date
(2) What was your function?
(3) Where you positioned at Headquarters or in a field office?
(4) Who was your counterpart in the field office (if you were at Headquarters) or at Headquarters (if you were in a field office)?

Part 2: Table

The following table shows impediments to information flow, including a short explanation. Thinking of the relief operation you noted, please choose whether you have experienced this being an obstacle to information flow and how frequently (rarely, sometimes, often).

1. Emergency Setting

		(1) = Rarely	(3) = Sometimes	(5) = Often
Urgency	*The urgent responsiveness of the disaster environment influenced information sharing. E.g. Too much organization on site, no time to communicate this to HQ.*	☐	☐	☐
Extreme uncertainty	*Receiving information of uncertain quality (regarding demand, supply and assessment).*	☐	☐	☐
Short supply chain life-cycle	*Processes are rapidly created and modified with little time to formalize associated information flows.*	☐	☐	☐
Complex environment	*The complexity and chaotic nature of managing information flows.*	☐	☐	☐
Many stakeholders & demands	*Donors have become influential in prompting humanitarian organizations to think in terms of greater donor accountability and transparency.*	☐	☐	☐
Inaccessibility	*Physical non-availability of information (Information system break downs, unprepared data).*	☐	☐	☐
Unreliability	*An organization's low level of confidence in the quality of data or information it possesses.*	☐	☐	☐

2. Organisational Structure

		(1) = Rarely	(3) = Sometimes	(5) = Often
Structure	*Centralized (decisions made at HQ) or decentralized (decisions made in the field location).*	☐	☐	☐
Need to standardize	*Processes are not standardized.*	☐	☐	☐
Lack of sense of ownership for decisions	*Ambiguity leads to people not taking responsibility for certain decisions.*	☐	☐	☐
Roles and responsibilities are not clear	*Ambiguity leads to people not taking responsibility for certain tasks.*	☐	☐	☐
Lack of process knowledge	*Uncertainty about the role makes it unclear who should be involved in which communications.*	☐	☐	☐
Low information priority	*Failure to place appropriate priority on information sharing.*	☐	☐	☐
Source Identification difficulty	*Not knowing where to obtain data or information.*	☐	☐	☐

3. Information Systems

		(1) = Rarely	(3) = Sometimes	(5) = Often
Inadequate stream of information	*Shortage or overload of information.*	☐	☐	☐
Storage media misalignment	*Information storage inherently constrains efficient information flow activities.*	☐	☐	☐
Need of robust equipment	*Condition of technology and the definition of manual processes.*	☐	☐	☐
Inconsistent data and information formats	*The sources are not consistent, or definitions vary. People "play safe" by taking the highest number and go with that.*	☐	☐	☐
Online system not being used much	*Leading to data in online system not being up to date, fragmented & stored in too many places.*	☐	☐	☐

4. Behavior

		(1) = Rarely	(3) = Sometimes	(5) = Often
Overworked staff & no time for information sharing	*Feedback/Reporting is less of a priority.*	☐	☐	☐
Information access depends on interpersonal relationship	*Due to uncertainty, staff improvise and establish unofficial channels of communication.*	☐	☐	☐
Language barriers	*Not understanding a language can make people not attending a meeting*	☐	☐	☐
HQ does not understand the field	*HQ is too far from field reality.*	☐	☐	☐
Unwillingness	*When one person decides not to transfer data or information to another person (due to regulatory law constraints or personal preference).*	☐	☐	☐

5. Environment

		(1) = Rarely	(3) = Sometimes	(5) = Often
Staff turnover (emergency phase)	*When staff leave, not all relevant information is shared with the replacement.*	☐	☐	☐
High staff turnover (generally)	*Skilled staff are always in short supply.*	☐	☐	☐
Lack of skilled workers	*Insufficient availability, internationally or locally.*	☐	☐	☐
Coordination costs	*Resources for meeting, travelling and hiring special staff for coordination are limited.*	☐	☐	☐
Cultural conflicts	*Different ways of working, living and thinking which can create conflicts in certain situations.*	☐	☐	☐
Not everyone is in the information loop	*People are excluded which leads to not having specific information.*	☐	☐	☐

Comments:

Questionnaire categories	Impediments to information flow	Situational Enabling: Impeding/favouring	Empowerment & Obligation: Norms & regulations	Individual Skills: Abilities & Skills	Individual desire, values	Was this an obstacle to information flow? Rarely	Sometimes	Often	Why and where was this a problem? (Reasons and examples)	Why and where was this a problem? (Short)	What was good? / How could this impediment be avoided? (Suggestions)	What was good? / Improvements? (short)
06 1. Emergency Setting	Urgent responsiveness	1				3	3	4				
	Extreme uncertainty	1				1	5	4				
	Short supply chain life-cycle	1				5	3	2				
	Complex environment	1				2	3	5	_MLogs: No infrastructure, no communication, no mobile network especially in the first weeks in remote regions. Also, due to too many different distribution locations, the project was extremely complex. Security issues complicated the distributions, as trucks could not be used due to no infrastructure (no roads) or security reasons. Distributions by boat were very complicated. _MAF DR Mngr: Since MAF is a service provider, we are eager to provide access to as many remote beneficiaries and NGOs as possible.	_no infrastructure _too many distribution locations and suppliers _security issues		_smaller project
	Many stakeholders & demands of donor accountability and transparency	1				5	1	4	_MAF DR Mngr: As a service provider, there are many stakeholders and expectations. Airstrip authorities, security (political and criminal, border control, reproach of being a spy), flight authorisations, political neutrality, part of the logistics cluster (air service on the last mile only), media, donor agencies, all NGOs (from as big as MSF to the smallest and local organization). _SKH: The fact that several elements of the Swiss Representation were actively involved also complicated communication since they were not familiar with the linear rapid response concept, defining clear lines of communication.	_Service provider stands amongst many stakeholder _Partners not familiar with rapid response concept including clear lines of communication	_MAF DR Mngr: Install good structures. We get information through contact to NGOs, Cluster meetings are for networking mainly. Normaly, we are networking with around 100 organizations. => through networking I receive information and can also give them to other NGOs. _SKH: Cooperation between specialized technical intervention and contextual expertise and logistics from local Swiss Embassy.	_clear structures _importance on networking _cooperation btw. specialized technical team and contextual expertise
	Inaccessibility		1			2	4	4	_SKH: The technical limitations of transferring information from the field to the other three locations (and vice versa) and the physical spread of rapid resonse team turned internal communication into a challenge.	_Transfer of information physically not possible	_Medair Comms IM: now moved on to using a **cloud server (->**efficiency in storage and collaboration), developing new tools of information collection (mobile data collection, GIS mapping) and analysis/disemmination (visual dashboards), consistant and informative communication (country management). simple communication flows : how to improve the ability for people to have the information they need, when they need it, and to a high degree or reliability.	_Cloud server, mobile data collection, GIS mapping, visual dashboards _consistant and informative communication (mngt) _Reliability
	Unreliability		1			2	6	2	_MERT: uncertainty about initial information. If we don't have high certainty, we don't have a strong framework, therefore don't know how much money, how big we should plan for.	_Uncertainty about initial information		

2. Organisational Structure	Structure		1			6	2	1	_MERT: Logistics are only supporters instead of advisors. _MAF DR Mngr: The Disaster Response unit is the only overall structure dealing with different MAF units and resource countries.	_Lacking of coordination function by logistics _Overall structure of RR unit difficult to understand by other units	_MERT: Logistics should be advisors. Field should be enabled to do evidence based activities. _MAF DR Mngr: flexible structures. No assignment is the same. Functions need to be covered, yes. and checklists help as as well as flowcharts (Pilots are trained to do that). But most decisions are made on the lowest hierarchy possible (avoid central decisionmaking). Leading of a team depends on the project manager's style.	**_Set logistics as advisors,** not only support function _Enable evidence based activities _MAF: flexible structures, aim at decisions at lowest level possible
	Need to standardize		1			4	5	1				
	Lack of sense of ownership for decisions		1			4	3	3	_MERT: who has the final authority was often unclear and everyone had a different understanding, also when it came to only discuss a decision. Not clear who takes the decision. Which details are needed.	_Final authority unclear		_Define final authority _Clear lines of communication
	Roles and responsibilities are not clear		1			4	6		_MERT: was a problem when informing us about the emergency before the first team is sent out.	_before sending out a team		
	Lack of process knowledge			1		5	2	3				
	Low information priority	1	1			3	5	1				
	Source Identification difficulty		1	1		6	3	1				
3. Information Systems	Inadequate stream of information	1		1		3	4	3	_MERT: When collecting information for taking the decision whether to deploy or not, time difference, trying to achieve too much. _SKH: the time difference required the field team to report back to Berne around midnight, which gave the HQ some time to formulate strategic suggestions that would be taken into consideration by the field team early in the morning.	_Collecting of relevant information _Time difference complicated IF	_MERT: 1. Set one block, not change this block. Not change it immediately. 2. Reduce the variables: Many different points of distributions (2'500), where and when... too many big variables. If you have two different hygiene kits, that is ok, but not in different locations. 3. You cannot say: Supply chain build before, then distribute. We built when we distributed at the same time. 4. Moving decisions to the preparedness phase: Prepositioning is a solution to the problem procurement. We would not have to do a procurement at all.	_Not changing numbers, but instead set **one project block** _Reduce variables **_Prepositioning**
	Storage media misalignment	1	1			2	5	3				
	Need of robust equipment		1			2	5	3				
	Inconsistent data and information formats		1			2	4	4	_MERT: constantly changing information due to staff adapting the numbers, turnover of staff (everyone had a different recording sheet)	_Constantly adapting numbers _Different recording sheets	_MERT: Turnover: standard template for recording sheets	**_Standard templates**
	Online system not being used much		1	1	1	2	3	4				
4. Behavior	Overworked staff & no time for IS		1	1	1	3	4	3				
	Info access depends on interpersonal realtionship				1	2	5	3				
	Language barriers			1	1	3	4	3				
	HQ does not understand the field		1	1	1	4	4	2	_MERT: Security; HQ does not understand the situation on site and for example suggests options that are not feasible. This depends also on who makes the decision.	_Wrong estimation on HQ side	_MERT: Some structure in communication scemes could help.	_Communication scemes
	Unwillingness		1			5	4	1				

5. Environment	Staff turnover (emergency phase)				1		5	5	_MERT: Every new teamleader had a different recording sheet _MERT: The handover from wave one to wave two (after 3 weeks) was a challenge	_Inconsistent data (distribution sheets) _Handover		
	High staff turnover (generally)				1	1	1	8				
	Lack of skilled workers			1		2	3	5	_MERT: requirements to the team not been respected (signatures, instructions on how to use sawyer filters)	_Lacking working knowledge (Signatures, instructions missing)	_MERT: Establish and communicate minimum requirements	_Establish & communicate minimum SOPs
	Coordination costs		1	1	1	5	4	1	_MERT: Lack of connection to support teams: why does Finance want the numbers? In the field they don't trust Finance. Accounting system should be able to distinguish big and small costs (project the food costs)	**_Lack of connection to and understanding of other departments** _Distinguishing big/small costs	_MERT: Food allowance is a solution possibility. Communicate the importance of the process, so that the field understands why it needs to send certain receipts the sooner the better.	_Vice versa understanding and adaption
	Cultural conflicts		1	1		4	5	1	_SKH: Sensitivity in communication with the Embassy in the field is essential			_Sensitivity with Embassy
	Not everyone is in the information loop		1	1	1	3	5	2				
	Total answers					**95**	116	86				
Comments	**Comments**								_Medair Head of Global Emergency Response: The questions are extremely relevant, though I found **some difficult to interpret and hold in contrast to other constraints.** I suspect that in an interview some of my answers might change in terms of impact on the overall response. Overall there are two sides of the coin: **processes and tools** that enable or constrain the flow of information internally within a response, and **structures and systems** that enable or constrain the flow of information externally within a response. Both are **affected by the response environment and response actors involved.** It is my belief that the response environment requires simplicity--the more nodes in the supply chain, or the communications loop, or the decision tree, the more constraints will be felt. For **response actors trust** is required. The amount of trust between individuals or organisations is directly proportional to the amount of trust			

8.7 Declaration of Authorship

Zurich University of Applied Sciences
School of Management and Law

"I hereby declare that this thesis is my own work, that it has been created by me without the help of others, using only the sources referenced, and that I will not supply any copies of this thesis to any third parties without written permission by the head of this degree program."

At the same time, all rights to this thesis are hereby assigned to ZHAW Zurich University of Applied Sciences, except for the right to be identified as its author.

Last name/first name of student (in block letters)

_____

Student's signature

_____

8.8 Student's Confidentiality Statement

Zurich University of Applied Sciences
zh aw School of Management and Law

Master's Thesis:

Information Flow in Humanitarian Relief Operations

The student, Andrea Rominger, hereby confirms with his/her signature on this document that he/she will not use the information received from Medair (name of organization) for any other purpose than for his/her Master's thesis, Information Flow in Humanitarian Relief Operations, and that this information will not be made available to any third party at any time without the express permission of Medair (name of organization).

The term "third party" refers to anyone not involved in the supervision or evaluation of this Master's thesis.

Winterthur, 26. June 2017

(Place, date) _____ (Student's signature)

8.9 Confidentiality Agreement

Zurich University of Applied Sciences
School of Management and Law

Confidentiality (Non-Disclosure) Agreement Concerning a Master's Thesis in the Consecutive MSc Programs at ZHAW Zurich University of Applied Sciences

Andrea Rominger is the author of a Master's thesis entitled **Information Flow in Humanitarian Relief Operations**. While carrying out project work in connection with this Master's thesis, he/she may have access to confidential information which he/she may also disclose or make use of in his/her Master's thesis.

The individuals at ZHAW who have some involvement in the Master's thesis therefore agree to keep confidential all information disclosed in it.

In particular, they agree to:

- Withhold any confidential information disclosed in the Master's thesis from any third party outside ZHAW. This does not include, and expressly allows, the use of plagiarism detection software. If asked to do so by the party whose confidential information is being disclosed, the Master's thesis shall be completely erased from the database.
- Exercise due care in storing the Master's thesis.
- Ensure that any confidential information disclosed is not used for any other purposes within ZHAW.

The obligation to maintain confidentiality does not apply if the information:

- Is common knowledge or generally available.
- Has been known to the recipient before it was disclosed by the author of the Master's thesis.
- Is or will be generally available without violating the confidentiality agreement.
- Has been developed or created by a member of ZHAW without using the information to which this confidentiality agreement refers or has been received by a member of ZHAW from a third party of whom it can be assumed by that member of ZHAW that he/she had the right to disclose such information.
- Has to be disclosed due to a legal or contractual obligation. In particular, this may be the case if there is an appeal against the examination result of a Master's thesis. The party whose confidential information is being disclosed acknowledges that in such a case ZHAW is obliged to disclose the information to an appeal board.

Equally, the obligation to maintain confidentiality does not apply if:

- The confidential information being disclosed no longer merits protection.
- The party whose confidential information is being disclosed is no longer interested in restricting this information to a limited circle of people.
- The party whose confidential information is being disclosed has given his/her express permission in writing that the recipient of this confidential information is released from his/her obligation of confidentiality.

Anyone asserting that there is no obligation to maintain confidentiality must be able to support this assertion.

Winterthur, _____ (date)

_____

Signature(s) of recipient(s) of confidential information at ZHAW