THE ROLE OF SUPPLY CHAIN FINANCE
IN HUMANITARIAN AID RELIEF

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# Table of Contents

Table of Contents .................................................................................................................. ii

List of Figures ......................................................................................................................... iii

List of Tables .......................................................................................................................... iv

ABSTRACT ............................................................................................................................... 1

RIASSUNTO ............................................................................................................................. 2

CHAPTER 1 Introduction.......................................................................................................... 3

Objective ................................................................................................................................. 3

The Content of the Document ............................................................................................... 4

CHAPTER 2 Background.......................................................................................................... 5

Humanitarian Aid and Funding ............................................................................................... 5

Humanitarian Supply Chain Management ............................................................................... 6

Supply Chain Finance ............................................................................................................. 9

The Issue of Humanitarian Aid Supply Chain Finance (HASCF) ........................................ 11

CHAPTER 3 Methodology....................................................................................................... 14

CHAPTER 4 Findings .............................................................................................................. 22

Classification of the references ............................................................................................ 22

Developing the findings of the topic ..................................................................................... 28

The supporting finding of the topic ...................................................................................... 51

CHAPTER 5 Discussion........................................................................................................... 60

The pillars of supply chain finance and humanitarian aid supply chain ................................. 60

The role and connection of supply chain finance in humanitarian aid ................................. 68

CHAPTER 6 Conclusion......................................................................................................... 71

REFERENCES ......................................................................................................................... 73

ACKNOWLEDGEMENT ....................................................................................................... 81
List of Figures

Figure 1.1 Typical Humanitarian Supply Chain (adapted from Oloruntoba and Gray, 2006) ....... 8
Figure 1.2 Disaster relief operation phase (adapted from Kovacs and Spens, 2007) .............. 9
Figure 2.1 Percentage of selected papers ........................................................................... 18
Figure 3.1 Themes of the papers ......................................................................................... 22
Figure 3.2 Methodologies used by the references .............................................................. 24
Figure 3.3 Type of the disasters discussed by the references ............................................ 25
Figure 3.4 Proportion of the papers mentioned a theory .................................................... 25
Figure 3.5 The paper's scope of location ............................................................................. 26
Figure 3.6 Disaster phase describe by the papers ............................................................... 26
Figure 3.7 Trends of the publications by year ..................................................................... 27
Figure 3.8 Collaborators of the papers .............................................................................. 27
Figure 3.9 Impact of the form of the funding on HO flexibility (adapted from Burkart et al. 2016) ........................................................................................................................................... 29
Figure 3.10 The overview of financial tracking services by UNOCHA (fts.unocha.org) .... 43
Figure 3.11 Metric of supply chain cost per beneficiary (adapted from Vaillancourt et al., 2018) .................................................................................................................................................. 44
Figure 3.12 Level of uncertainty within the food-bank network (adapted from Davis et al. 2016) ................................................................................................................................................ 50
Figure 3.13 The interface of lists of the donors and the beneficiaries (pbfi.unocha.org) ...... 53
Figure 3.14 The interface of the allocation overview (source: pbfi.unocha.org) ................. 54
Figure 3.15 The interface of the detailed program (source: pbfi.unocha.org) ...................... 55
Figure 3.16 The crowdfunding framework (adapted from Salazar et al. 2015) ................. 57
Figure 4. 1 Main actors of humanitarian supply chain aid (re-adapted from Thomas and Kopczak, 2005) ......................................................................................................................... 60
Figure 4. 2 Pillars of SCF and humanitarian supply chain .................................................. 62
Figure 4. 3 The sequence line of HASCF .......................................................................... 68
List of Tables

Table 1.1 Hazard Classification by WHO ................................................................. 5
Table 1.2 The description and solution offered within groups of SCF solutions (adapted from Caniato et al. 2016) ................................................................................. 10
Table 2.1 Keywords Combinations ........................................................................ 17
Table 2.2 The redundancy of the papers in keywords used ..................................... 18
Table 2.3 Other Science Field Covered by the Keywords ...................................... 19
Table 3.1 Benefit and Challenges of Blockchain .................................................. 39
Table 3.2 Information of the online portal tracking services (pbfi.unocha.org) .... 54
ABSTRACT

Humanitarian aid relief has been working since the late 19th century. The humanitarian organizations handle numerous cases of both development aid and disaster aid. Humanitarian aid relief has a strong relationship with the supply chain in many terms, starts from procuring the funding, acquiring relief aid, managing the distribution to the beneficiaries, and coordinating among the stakeholders. Unfortunately, due to the nature of uncertainty and the agile environment of this field, the humanitarian organization faces challenges such as corruption, funding gaps over the years, and the demand for accountability and visibility.

Humanitarian aid has a different mechanism to tackle each step of the relief. Funding and financing are two crucial elements in the humanitarian supply chain. But the study regarding the supply chain finance (SCF) and humanitarian supply chain is currently underdeveloped. The purpose of this paper is to investigate the role of SCF in the humanitarian aid relief and discuss the idea of combining the SCF in humanitarian aid. The methodological approach for this thesis is the literature reviews from the journals, papers, and reports associated with humanitarian aid relief and SCF.

The findings indicate the relation between the three essential elements of SCF with the focus in liquidity/cash, operational activities, and engagement among the actors, to the field of humanitarian aid. Based on these elements, the thesis proposed a framework picturing how the sequence of humanitarian aid relief and the theory of SCF need to collaborate to perform the practices of humanitarian aid supply chain finance (HASCF). The framework might be proposed practically in every stage of humanitarian aid relief (pre-disaster/during disaster/post-disaster). The findings clarify the importance of a robust internal system in the elements as well as the external system among the elements, to better collaborate in performing the relief aid.

This thesis describes the contributions of humanitarian aid relief over the years. The readers with little knowledge about this field and the humanitarian experts, can grasp the information about the humanitarian aid during the last decades. Also, the thesis presents the previous practical cases, strategies, and theories which humanitarian experts can refer to improve the relief performance better. This thesis can be the starting point in initializing the practice of HASCF.
RIASSUNTO

Gli aiuti umanitari funzionano dalla fine del XIX secolo. Le organizzazioni umanitarie gestiscono numerosi casi di aiuti allo sviluppo e di aiuti in caso di calamità. Gli aiuti umanitari hanno una forte relazione con la catena di approvvigionamento in molti termini, partono dall'acquisizione dei finanziamenti, dall'acquisizione degli aiuti di aiuto, dalla gestione della distribuzione ai beneficiari e dal coordinamento tra le parti interessate. Sfortunatamente, a causa della natura dell'incertezza e dell'ambiente agile di questo campo, l'organizzazione umanitaria si trova ad affrontare sfide come la corruzione, i deficit di finanziamento nel corso degli anni e la richiesta di responsabilità e visibilità.

L'aiuto umanitario ha un meccanismo diverso per affrontare ogni fase del soccorso. Il finanziamento e il finanziamento sono due elementi cruciali nella catena di approvvigionamento umanitario. Ma lo studio riguardante il finanziamento della catena di approvvigionamento (SCF) e la catena di approvvigionamento umanitario è attualmente sottosviluppato. Lo scopo di questo documento è di indagare sul ruolo di SCF nella riduzione degli aiuti umanitari e discutere l'idea di combinare SCF in aiuti umanitari. L'approccio metodologico per questa tesi è la revisione della letteratura da riviste, articoli e rapporti associati agli aiuti umanitari e alla SCF.

I risultati indicano la relazione tra i tre elementi essenziali di SCF concentratosi su liquidità / liquidità, attività operative e impegno tra gli attori, nel campo dell'aiuto umanitario. Sulla base di questi elementi, la tesi ha proposto un quadro che illustra come la sequenza di aiuti umanitari e la teoria di SCF debbano collaborare per eseguire le pratiche di finanziamento della catena di approvvigionamento di aiuti umanitari (HASCF). Il quadro potrebbe essere proposto praticamente in ogni fase degli aiuti umanitari (pre-disastro / durante il disastro / post-disastro). I risultati chiariscono l'importanza di un solido sistema interno negli elementi e del sistema esterno tra gli elementi, per collaborare meglio nell'esecuzione degli aiuti di soccorso.

Questa tesi descrive i contributi degli aiuti umanitari nel corso degli anni. I lettori con scarsa conoscenza di questo campo e gli esperti umanitari, possono cogliere le informazioni sull'aiuto umanitario negli ultimi decenni. Inoltre, la tesi presenta i precedenti casi pratici, strategie e teorie a cui gli esperti umanitari possono fare riferimento per migliorare le prestazioni di soccorso. Questa tesi può essere il punto di partenza per inizializzare la pratica di HASCF.
CHAPTER 1

Introduction

This thesis describes the relationship of two different fields: the supply chain finance and humanitarian aid relief. Both of the topics are strongly related to the practice of supply chain management. Supply chain finance emphasizes the importance of managing the financial flow at the inter-organizational level through the technology and aligning them with the product and information. Meanwhile, the humanitarian aid relief, the practice of supply chain management reflected through managing the whole resources (cash, items, and parties) to deliver the relief aid and assist the beneficiaries along with its agile environment and challenges.

Actors with their various roles and responsibilities are supporting both supply chain finance and humanitarian aid relief. The literature is exploring both the humanitarian aid and supply chain finance in two different topics. It is still undetermined how these two fields would play a role simultaneously. This thesis presents both the theoretical and practical experiences published in the literature. This thesis describes the role of supply chain finance in humanitarian aid relief. The findings of this thesis will be beneficial to the readers who have little knowledge about this field, and humanitarian supply chain practices in managing the flow of resources (material, information, and funding) in all stages of humanitarian relief (pre-disaster/during disaster/post-disaster).

Objective

Funding and financing are crucial for the humanitarian supply chain. Without these elements, the humanitarian supply chain will not be working properly. However, according to the preliminary understanding, the research on this is not yet developed. An alternative approach to the problem is by conducting a systematic review, to answer the question of whether it is true that the research of combining the supply chain finance and humanitarian aid is underdeveloped, and what the literature has investigated so far.

By exploring the supply chain finance and its contribution towards the humanitarian aid relief, open a new opportunity in delivering a unique perspective and the possibility of improvement. This thesis proposes the theory of the humanitarian aid supply chain finance. This thesis can be a proposal for the humanitarian experts on field and the beginner readers who are interested in investigating this field.
The Content of the Document

The document is divided into six chapters. Each chapter will be focusing on several aspects, as follows:

The "Chapter 1: Introduction" presents the topic of the thesis, the thesis' purpose, and the construction of the document.

The "Chapter 2: Background" presents an overview and careful research on humanitarian aid and response, humanitarian supply chain, and the supply chain finance and the issue of humanitarian supply chain faced based on the literature.

The "Chapter 3: Methodology" presents the methodology of this research. This chapter will describe the detail of the literature review, start from the determining the keywords to find the literature, defining the research question, and the focus on how we will extract the data and write the review.

The "Chapter 4: Findings" presents the findings in the literature that divided into sections to arrange the focus of this thesis. The highlight will be on humanitarian supply chain finance and other information to strengthen the arguments, sourced from other reliable references.

The "Chapter 5: Discussion" presents the highlights on how the humanitarian aid and supply chain finance are connected. In this section, the answer to the research questions also will be elaborated.

The "Chapter 6: Conclusion" will be offering the summary part of the main contribution of the thesis, also the limitation and the suggested future research.
CHAPTER 2

Background

Humanitarian Aid and Funding

Humanitarian aid is material logistic assistance to people who need help. An extensive humanitarian relief community has developed since the 2nd world war (Oloruntoba and Gray, 2006). The government or other institutions (local or international communities) usually help the beneficiaries. Furthermore, in reaching out to the international communities, there is a United Nations (UN) institution. This institution has the task to integrate the humanitarian activities of international organizations and governments to ensure a consistent and rapid response to disaster for the world area, named the Office for the Coordination of Humanitarian Affairs (OCHA) (Harat et al. 2015). Besides that, the UN also has another four entities that have roles in delivering humanitarian aid. The four bodies are United Nations High Commissioner for Refugees (UNHCR), United Nations Children’s Emergency Fund (UNICEF), United Nations Development Programme (UNDP) and World Food Programme (WFP). Humanitarian aid is typically in response to humanitarian relief efforts, including natural disasters and man-made disasters. Besides, the people in need are the homeless, refugees, and victims of natural disasters, wars, and famines (United Nations).

The discussion in humanitarian aid needs to begin with distinguishing the type of assistance. The emergency assistance (relief assistance) is an immediate reaction in the case of man-made or natural disaster. It usually happened for short-term aid. While the other one is the development or rehabilitation aid (R/D), it is the assistance to transferring knowledge and resources to build up the capacity of the country. It usually covers the mentoring and assistance in education, health, and support to improve the local communities. These could happen for a long time; therefore, it will be more familiar with the term: long-term assistance (Harat et al. 2015).

Other classification based on WHO (World Health Organization), one of the UN entities, also divided the disaster into two classifications based on origins of disasters: the natural disaster and man-made disaster (WHO/EHA, 1998).

<table>
<thead>
<tr>
<th>Natural Disasters</th>
<th>Man-made disasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meteorological: hurricanes, heavy rains, floods, drought, famines, heat waves, and cold waves</td>
<td>Wars and civil strife</td>
</tr>
<tr>
<td>Topographical: landslides and avalanches</td>
<td>Industrial disasters</td>
</tr>
</tbody>
</table>
Disaster Management is composed of four different phases - mitigation, preparedness, response, and rehabilitation (Van Wassenhove, 2006). The first two phases happen before the occurrence of the disaster and need to take precautions to avoid or minimize the negative impact. The latter two stages deal with the short-term response after a disaster has occurred and long-term construction to bring the community back to its pre-disaster condition (Seifert et al. 2018).

Despite the growth of global economic gains, humanitarian needs are increasing. More than 1% of people living around the world now are caught up in major humanitarian crises. In recent years, more than 120 million people require urgent humanitarian assistance and protection. Most of the humanitarian crises have resulted from reciprocal action between natural hazards, armed conflict, and human vulnerability. Conflict will remain the main driver for humanitarian needs in 2019. People’s vulnerability is also included in where they live and how they live. Poverty, inequality, population growth, urbanization, and climate change can erode people’s resilience and make them more susceptible to shocks. Although development gains are being made, progress has been uneven (UNOCHA, 2019).

The UNOCHA aims to mobilize and engage a full range of financing instruments, mechanisms, and partners to ensure them meetings with the growing humanitarian needs. Besides, OCHA works with humanitarian partners around the world to identify humanitarian needs, plan responses, and determine the budgets needed to address them (unocha.org). The UNOCHA itself has the task to not only bringing the direct aid to the area affected by the natural disasters, but also helping the donators, for example, UN Member States following the international law and human rights. The office has undertaken the responsibility to improve the awareness of those involved in the conflict or affected by disasters. Thanks to UNOCHA, which has the work in coordinating the humanitarian assistance, the UN has one of the world’s largest databases for crises and disasters, which allows for more conscious disposition of funds and making decisions (Harat et al. 2015).

**Humanitarian Supply Chain Management**

Supply chain and logistics are the backbone of humanitarian operations to ensure affected people survived and receive relief assistance. 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 the point of origin to the end of consumption to alleviate the suffering of vulnerable people (Thomas and Kopczak, 2005). The function encompasses a range of activities, including preparedness, planning, procurement, transport, warehousing, tracking and tracing, and customs clearance. Humanitarian logistics plays an important role. First, it is crucial to the effectiveness of the speed of response in major humanitarian programs such as food, shelter, health, water, and sanitation. Second, the procurement and the transportation included can be the most expensive part of the relief effort. Third, since the logistics part handled the tracking of goods, it would be a significant repository data that can be analyzed after the post-event to provide further learning (Thomas and Kopczak, 2005).

After the Asian Tsunami 2004, humanitarian logistics was admitted to play an essential role in effective disaster relief, which led to an increasing interest for academic researchers and practitioners. This field has progressively involved a supply chain management (SCM) approach. This involvement, not only focusing on the material flow, but also the information flow, the procurement, coordination between the actors, custom clearance, and even the financial flow. The donor plays an essential role in the humanitarian supply chain (Kunz and Gold, 2015).

Unlike the business supply chain, the humanitarian supply chain tends to be more unstable (because of the high level of uncertainty in the level of both beneficiaries and the funding required). The supply chain breaks down at the receiving end. Moreover, it also can be unstable because of two main reasons: politicized donation and the competition to get the funding from the donors (Oloruntoba and Gray, 2006). This figure below illustrates the type of humanitarian supply chain management.
The commercial supply chain usually focuses on the customer as the final of the entire chain. For example, the fast-moving consumer goods (FMCG) companies that concern of the whole chain, start from the raw material to the finished product and its distribution. Some of the supply chain design even involved the customer as the input for their process. These happen both in manufacturing the products or providing the services. For example, the airplane construction that might be involved in the customer’s request. But, in the case of the humanitarian supply chain, the end-user is seldom engaged in the commercial transaction, and they have a little control oversupply. Instead, the ‘marketing’ or the ‘customer service’ of the humanitarian service may need to target supplier or donor regarding the humanitarian action (Oloruntoba and Gray, 2006). Also, the supply chain management in the humanitarian situation involves the relationship between the actors that enable relief items (including cash) to get to the right place at the right time (Cozzolino, 2012).

Based on the Hau Lee model (Lee H. L., 2002), the humanitarian supply chain is considered as the “agile” supply chain. The agility means the “ability to thrive and prosper in an environment of unpredictable change,” as “all about customer responsiveness and mastering market turbulence” and as “a business-wide capability that embraces organizational structure, information system, logistics process and, mindset” (Christopher and Towill, 2000). Through a sufficient information infrastructure, sensitive analysis of the need on the fields would enhance the supply chain to be very responsive to the changing needs of the end-user, by being able to respond immediately to the change (Oloruntoba and Gray, 2006). The operating conditions faced by humanitarian logistics are quite complex. They include supply and demand uncertainty, high
decentralization, and multiple parties with different objectives (Van Wassenhove and Martinez, 2010)

Lee and Zbinden (2003, cited by Kovacs and Spens, 2007) discussed 3 phases of disaster relief of operations; preparedness, during operations, and post-operations. Kovacs and Spens (2007) then developed the different activities distinguish in the times before the disaster strikes (preparation), instantly after the disaster (immediate response), and in the aftermath of a natural disaster (reconstruction). Different skills are needed to tackle these 3 phases of relief. The figure below will illustrate the step of disaster relief operations.

![Figure 1.2 Disaster relief operation phase (adapted from Kovacs and Spens, 2007)](image)

**Supply Chain Finance**

The humanitarian response is the collaboration between donors, institution/non-government organization (NGO)/government, and the beneficiaries, emphasizing actors that involved in this area. The supply chain finance aims to optimize the financial flows at an inter-organizational level through solutions implemented by financial institutions or technological providers. Gelsomino et al. (2016, cited by Bals, 2019) emphasized the benefits of the supply chain finance (SCF) optimize financial flows at an inter-organizational level (Hofmann, 2005) through solutions implemented by financial institutions (Camerinelli, 2009), or technology providers (Lamoureux and Evans, 2011). The ultimate objective is to align financial flows with product and information flows within the supply chain, improving cash-flow management from a supply chain perspective (Wuttke et al. 2013).

(Caniato et al. 2016) described two different perspectives in SCF, the “supply chain-oriented” and the “financial perspective”. The “supply chain-oriented” embraces the working capital decisions (e.g., accounts payable, receivable, and inventories) and sometimes fixed asset
financing. In general, this perspective focuses on the optimization of financial flow in the supply chain.

Caniato et al. (2016) added the “financial perspective”, with a focus on financial products for the companies in the supply chain, frequently this perspective focuses only on reverse factoring. The financial perspective interprets the SCF as a set of financial solutions. This perspective focuses on the short-term financing, specifically either on payables or receivables. Caniato et al. (2016) then described the SCF solutions within three groups: traditional financing solution, innovative financing solutions, and supply chain collaborative (SCC) solutions, with the descriptions and solutions offered as follows:

Table 1.2 The description and solution offered within groups of SCF solutions (adapted from Caniato et al. 2016)

<table>
<thead>
<tr>
<th>Groups</th>
<th>Description</th>
<th>Solutions offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional</td>
<td>involve a low degree of trade process digitalization</td>
<td>Captive factoring, reverse factoring</td>
</tr>
<tr>
<td>financing solutions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovative</td>
<td>includes innovative solution, required high level of trade process digitalization and comprehensive supply chain analysis</td>
<td>Advanced forms of reverse factoring, inventory financing, dynamic discounting, seller-based invoice auction</td>
</tr>
<tr>
<td>SCC solutions</td>
<td>optimize the working capitals, focus on inventory, through collaboration among supply chain players.</td>
<td>Vendor-managed inventory (VMI), consignment stock</td>
</tr>
</tbody>
</table>

In the humanitarian supply chain, the inventories of the in-kind donations are considered in the whole supply chain. Thus it can be considered as working capital. Besides, the humanitarian aid response also involved actors along the chain, start from the donors to the beneficiaries. Therefore, by analyzing the collaboration work between them, we can define on how the role of supply chain finance in humanitarian aid response.

Funding for humanitarian response comes from the donors. (Islam et al. 2013) in their paper, categorized the donors into 3 principal types: individual and small group donors, corporate donors, and government donors (Islam et al. 2013). In the perspective of humanitarian response, funding not only determines the scope of humanitarian actions but has a crucial impact on their speed, effectiveness, and efficiency. However, research on the connection between funding and
humanitarian operations is limited. Thus, it has been identified as a significant research gap. For example, interesting research can be done on the impact of funding factors (e.g., insufficient, irregular and uncertain funding, various types of earmarking) on the performance of humanitarian organizations (Starr and Van Wassenhove, 2014). The humanitarian logistics is overshadowed by fundraising, as it crucially depends on it. Therefore, it is no surprise that many authors, directly and indirectly, consider funding as significant research gaps (Burkart et al. 2016).

The Issue of Humanitarian Aid Supply Chain Finance (HASCF)

Over the years, NGOs have invested staff, time, and logistics resources in processing the in-kind donations, but then they found most of the in-kind donations are not meeting the relief purposes (Islam et al. 2013). The unsolicited in-kind donation usually sent to the relief organization without notifications. These donations will create a new problem such as an overflowing warehouse - which there will be a possibility the wanted donations will be stored outside the warehouse. This happens as the consequence of the overcapacity. Additional time and resources to sort the needed relief items as well as the disposal of unwanted donations might require orderly disposal (such as medical and pharmaceutical items). Another implication is the loss and the opportunity costs of those relief items that will impact the humanitarian organizations. Another case is where the donation does not meet the requirement of the local and geographical needs (for example, donating jackets for tropical countries). These issues are impacting in the accumulation of donations in the storage and blocking the flow of needed supply, thus creates the ‘second disaster’ (Islam et al. 2013). Besides, the over-flooding inventory is a working capital. As the inventory increases, so does the working capital. Therefore, some of the NGOs are no longer accepting unsolicited in-kind donations and promoting ‘cash only’ donations (Islam et al. 2013).

In addition, Van Wassenhove (2006) suggested that 80% of the costs of responding to a disaster fall into Logistics Supply Chain Management (LSCM) realm and (Heigh, 2012) mentioned that some of the 40% of the financial resources consumed by humanitarian logistics (HL) goes to waste (Islam et al. 2013). Whitting and Ayala-Ostrom (2009) realized that logistics is not part of the mandate of humanitarian organizations, and that is perhaps one of the reasons why it is poorly valued. Meanwhile, even a small reduction in logistics cost would yield enormous savings. The saving leads to a discussion of whether the in-kind donation is the best option in doing the humanitarian reliefs, or it is better to donate in the monetary donation.
From the perspective of funding, as reported in Global Humanitarian Overview 2019 published by UNOCHA, in 2018, the funding required was $24.88 billion, while the funding received was $13.87 billion, which means only 56% of the funding was covered. The donors have become generous, but the gap between the requirement and the funding response happened every year. And since 2008, the difference is getting bigger. In 2019, humanitarian needs will remain extremely high. Around 132 million people will require humanitarian assistance and protection, close to the figure of 2018. The UN and other humanitarian organizations are aiming to reach close to 94 million of the most vulnerable people with humanitarian assistance and protection, with estimated financial requirements of at least $21.9 billion.

As stated before in Global Humanitarian Overview 2019, there has been a gap between the funding required and the funding collected for the past ten years. If the funding cannot meet the expected demand, this will be associated with the opportunity costs in the form of unsatisfied and urgent need for humanitarian activities which cannot be pursued simultaneously. Improving funding systems can lead to cost savings and efficiency gains, thus allowing in reaching more beneficiaries (Burkart et al. 2016).

In 2019 it was forecasted that the funding requirement for the long-term assistance (development assistance) would be higher than for the short-term assistance (emergency assistance). Meanwhile, the donors are more generous towards the emergency assistance (UNOCHA, 2019).

Another issue is about transparency and corruption. Based on (Salvado et al. 2018) humanitarian supply chain managers face many challenges nowadays:

- The increasing gap between funding and appeals
- Donors ask for more transparency and accountability, and
- The growing pressure to switch to sustainable development

The aid flows from the donors, the government/institutions, and to the beneficiary. But we have little visibility through all these processes. The humanitarian agencies are often reluctant to consider cash-based responses because of a perception that they may be more vulnerable to corrupt diversion, looting, or theft (Harvey, 2007). Especially in the humanitarian field, more people are trying to help the others; this will impact on the issue of loss of control since there are intermediaries (Harvey, 2007). The visibility between the donor and the recipient need to be developed to gain the trust of the donors. Also, among the program support function, the division such as procurement, mentioned as the activity which is prone to corruption. However, other activities, such as supply chain, finance, audits, human resource, also entail with the risk of
corruption (Maxwell et al. 2012). The consequences of corruption are seen primarily to the agency’s images and reputations. Thus it will be resulting in the ability to raise funds (Maxwell et al. 2012).

To give a summary, we will point out some definitions that we will discuss in the following chapters. We will mainly focus on SCF and the humanitarian supply chain. The SCF covers the inter-company optimization of financing as well as the integration of financing process with customers, suppliers, and service providers to increase the value of all participating companies (Pfohl and Gomm, 2009). While, humanitarian supply chain aims to ensure the prioritization of needs and respond to affected people using given resources during and after a disaster (Van Wassenhove, 2006), in other words, humanitarian supply chain strives to mitigate the suffering of vulnerable people to the greatest extent possible (Thomas and Kopczak, 2005). Each of the discipline complements one another. The considerable uncertainty the humanitarian response face is already the challenge for them, so it is needed to investigate further the issue of humanitarian aid supply chain finance (HASCF). The actors along the chain of the humanitarian supply chain need to optimize and integrate the financing process to ensure the beneficiaries receive the sources required.
CHAPTER 3

Methodology

This thesis proposes the view that is applying the systematic review in connecting the areas of supply chain finance and the humanitarian supply chain logistics area. The systematic review methodology aims to counteract bias by making explicit values and assumptions underpinning a review. By enlarging the legitimacy and authority of the resultant evidence from the systematic review, the policy-maker and practitioners could rely on this basis to formulate decisions and take action (Tranfield et al. 2003).

The aim of conducting a systematic review on humanitarian supply chain finance is to discuss the combination of both areas of HASCF, to find out how the authors have addressed the issues. In contrast, the funding of humanitarian response is crucial both for the donors and the institutions. As mentioned in the previous chapter that the funding in humanitarian aid is vital, and other issues related to funding also take place (corruption, financial visibility, unsolicited donations). Providing more research on this topic could help on several things: to ensure the donors on how the flow of the funding, to coordinate the institution and the donors better in delivering the aid, and to bring efficiency in transferring funds by leveraging current technology.

A detailed methodological approach is necessary in any literature review. A systematic review would be inappropriate if the research question is too vague or broad, but also if it is too narrow. Therefore, Okoli (2015) presented eight steps guide to conducting a systematic literature review:

1. **Identify the purpose:** the first step of a systematic literature review is to define the review’s mission and goals clearly, thus it will be necessary for the report to be explicit to their readers.

2. **Draft protocol and train the team:** the reviewer needs to be completely clear and in agreement with the procedure they will follow. A detailed written protocol and training for all reviewers (if the reviewers are more than one person) to ensure the consistency of how they will execute the review will be required.

3. **Apply practical screen:** the reviewers need to be explicit on what study they are considering and the one that they are eliminating (which is an essential part of any literature review). The excluded studies, the reviewer must state their reasons for not considering them and justify how the resulting review can still be comprehensive, given the practical exclusion criteria.
4. **Search for literature:** the reviewers need to be explicit in describing the details for the literature search and need to explain and justify how the assured the search’s comprehensiveness.

5. **Appraise quality:** the reviewers need to spell out the criteria they use to judge which paper they will exclude for the insufficient quality. Researchers need to score all include papers, depending on the research methodologies they employ, for their quality.

6. **Extract data:** after the reviewers have identified all the studies included in the review, they need to extract the applicable information from each study systematically.

7. **Synthesize studies:** this step involves combining the facts extracted from the studies by using appropriate techniques, whether quantitative, qualitative, or both.

8. **Write the review:** the process of systematic review reported in sufficient detail; thus, other researchers can independently reproduce the review’s results.

Going through all the theory of systematic review, we will explain further and more detail of each step.

1. **Identify the purposes**

As stated in chapter 1 that although the humanitarian relief community has developed since the Second World War, the humanitarian aid is often lacking a coordinated plan. Also, NGOs often compete with each other for donations. Humanitarian aid supply chain even unstable because of 2 main reasons: politicized donation by government and competitive nature if fund-raising from private donors (Oloruntoba and Gray, 2006). The specific topic of humanitarian supply chain finance is still underdeveloped. Only five references available on the Scopus database that are directly linked to the humanitarian supply chain finance.

Based on this assumption, we will try to develop a systematic review of the humanitarian supply chain finance. The goal of the research is to see the connection between the finance and the humanitarian supply chain management. Also, to see what the authors and current literature have discussed so far.

2. **Draft the protocol and train the team**
   - The protocol needs to be developed before conducting a study. A protocol is defined as a plan that describes the conduct of a proposed systematic literature review (Kitchenham and Charters, 2007). To have the same understanding before the study, the team had an internal discussion to scope this research. To avoid the misunderstanding and to keep the team in line with the research goals, we had some consideration for this research, such as:
• The research will focus on how is the connection and the intersection between the supply chain finance and humanitarian supply chain management

• The study will focus on the analysis of the organization (or multiple organizations) in the operation of humanitarian supply chain management

• The research will not focus on disaster management in the context of technical area (for example: early warning system and how each area or country manage the disaster). The research will focus on the humanitarian aid supply chain finance (the funding and donation, the relationship of the actors in the chains, the role of information and technology to support the flow of the funding).

• The research will be selected from the papers published on Scopus from 2006-2019, since the UN released a report that Indian Ocean Tsunami (2004) and Pakistan’s Earthquake (2005) as the five deadliest disaster of the last 20 years. Thus, scoping the research close to both of the disasters would be relevant.

As we already agreed on the preliminary scope, then we need to determine the research questions. The research question is: What are the connection and the role of supply chain finance in humanitarian aid?

3. Apply practical screen
The selection stage involves what the researcher is searching for and what the study will be including and discarding some of the studies that clearly will not meet the research objectives. The references will be selected from the literature Scopus databases; some additional reports of humanitarian will be selected based on Google Scholar. From Scopus, the texts will include articles, papers, editorials. Also, the references will be selected if written in English. When considering the report related to humanitarian on Google, we are discussing some reports published by the UN, UNOCHA, UNISDR, WFP, and other institutions. The search is performed based on these criteria. The literature review will focus on keywords:

• Humanitarian supply chain management
• Humanitarian aid
• In-kind donation
• Cash donation
• Supply chain finance
• Crowd-funding

These terms were collected to obtain more references in the scope of the humanitarian supply chain and humanitarian aid. Some recommendations from Professor Harland and Professor Caniato also included widening the possibility the references that related to donations and funds. Truncation characters need to be taking account to acquire more possible papers. The string can consist of simple operations, for example, “*” or “?”, and also Boolean Logic such as “and” and “or”.

4. Searching for literature

As we follow step 3, then the papers and journals on the Scopus are searched, and the selected ones will be determined by quick review through the title and abstracts. By learning 18 combinations of keywords related to Humanitarian Supply Chain Finance. The detailed list of the 18 combinations of keywords will be presented in table 2.1. After considering the titles and abstracts, a total of 1330 papers were found based on 18 keywords combinations. This table below shows the list of the keywords and search terms used to select the references.

<table>
<thead>
<tr>
<th>No</th>
<th>Keywords</th>
<th>Hits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Humanitarian Aid Blockchain</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Humanitarian Aid Corruption</td>
<td>41</td>
</tr>
<tr>
<td>3</td>
<td>Humanitarian Aid Finance</td>
<td>31</td>
</tr>
<tr>
<td>4</td>
<td>Humanitarian Aid Procurement</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Humanitarian Aid Security</td>
<td>549</td>
</tr>
<tr>
<td>6</td>
<td>Humanitarian Aid Working Capital</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>Humanitarian Procurement</td>
<td>122</td>
</tr>
<tr>
<td>8</td>
<td>Humanitarian Supply Chain Blockchain</td>
<td>3</td>
</tr>
<tr>
<td>9</td>
<td>Humanitarian Supply Chain Donor Management</td>
<td>29</td>
</tr>
<tr>
<td>10</td>
<td>Humanitarian Supply Chain Finance</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>Humanitarian Supply Chain Fund</td>
<td>11</td>
</tr>
<tr>
<td>12</td>
<td>Humanitarian Supply Chain Fund*</td>
<td>41</td>
</tr>
<tr>
<td>13</td>
<td>Humanitarian Supply Chain Funding</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>Humanitarian Supply Chain Funds</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>Supply Chain Donor Management</td>
<td>171</td>
</tr>
<tr>
<td>16</td>
<td>In-Kind Donation</td>
<td>95</td>
</tr>
<tr>
<td>17</td>
<td>Wanted Donation</td>
<td>163</td>
</tr>
<tr>
<td>18</td>
<td>Crowdfunding donation</td>
<td>132</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>1330</strong></td>
</tr>
</tbody>
</table>
5. **Quality Appraisal**

The quality appraisal here is a useful screening of the articles according to the criteria to decide the kind of material that will be considered or not. The references will be selected entirely based on Scopus academic database, and the reports will be selected if the reputable institutions or NGOs publish it. In this research, the chosen reports are from the UN and its entities that available publicly online on the internet. For example, Global Humanitarian Overview Reports 2018 and 2019, which are published by UNOCHA, and the report published by the humanitarian organization such as Fritz Institute.

6. **Extract the data**

As an additional consideration, the year of publications also counted as a reasoning in selecting the papers. The chosen references have a span of years from 2006-2019. Going into the more in-depth selection by taking a review on title and abstract, 44 papers (around 3% of the total documents found) are selected to be close to this subject.

![Papers Selected](image)

**Figure 2.1 Percentage of selected papers**

The reason why only 3% that accounted will be discussed further is because some papers appear in more than one keyword, so those are redundancy. To better describe the occurrence of the repetition, here are the examples:

<table>
<thead>
<tr>
<th>Title of the selected papers</th>
<th>Authors and Year</th>
<th>Keywords Used</th>
</tr>
</thead>
</table>
| The funding- Humanitarian supply chain interface | Christian Burkart, Maria Besiou, Tina Wakolbinger (2016) | • Humanitarian Supply Chain Funds  
• Humanitarian Supply Chain Funding  
• Humanitarian Supply Chain Fund |
Moreover, the used keywords also appear in other fields, such as medical, psychology, geographical, political, and entrepreneurial. Additionally, most of the papers discussed the Corporate Social Responsibility (CSR), which will be excluded in this research. As mentioned in Table 2.1, we have 18 keywords, and when entering those keywords to the Scopus, and eight keywords cover other science fields (not in the scope of HASCF). Here are the lists of the keywords and in which area these keywords are also covered.

<table>
<thead>
<tr>
<th>Keywords</th>
<th>Other Science Field Covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>The word contains “security”</td>
<td>Political and geographical</td>
</tr>
<tr>
<td>The word contains “donation” and “donor”</td>
<td>Medical and psychological</td>
</tr>
<tr>
<td>The word contains “blockchain” and “humanitarian”</td>
<td>Information and Technology (IT)</td>
</tr>
<tr>
<td>The word contains “crowd-funding”, “funding”, and “cash”</td>
<td>Entrepreneurial, taxation, and CSR</td>
</tr>
</tbody>
</table>

As stated before, the keywords used also covered other fields; this also results in the papers that were not relevant to this study. As a consequence, only 44 articles (3%) out of 1330 documents that were found, classified as match with our interest.

To go to more detail about the current situation of humanitarian aid, four reports from the UN also take into the considerations, for example, the “Global Humanitarian Review 2019” from UNOCHA and “The Disaster Report 2018” from UNISDR. Based on the selected papers, we make a table in Excel to simplify the classification and the details. We categorized the articles into themes. To better classify the general themes of each 44 papers, nine themes are proposed to see the bigger picture of each paper. It is also possible that one article can hold more than one issue. Here is the list of the themes:

1) In-kind or cash donation
2) Temporal (pre/during/post) disaster/development aid
3) Information technology or digital technology
4) Corruption
5) Logistics
6) Financial tracking and tracing
7) Procurement
8) Supply chain finance
9) Forecasting

Not only classifying based on the themes, but necessary information about the papers also taking into considerations, to better identify the papers in the future, even to see statistically the dispersion of the papers based on the methodologies, the year published, the collaboration of the institutions, and more details. Here it is the list of the information that we collected during the reading phase of the literatures:

1) Title
2) Authors
3) Year
4) Name of the journal
5) Name of the source
6) Name of the keywords used
7) Link
8) Summary of the paper
9) Conclusion of the paper
10) Comments; personal comments from the reviewer
11) Proposed research or recommendation (if any)
12) Methodology; how the author collect the data in the references, whether it is a literature review, observation, interview, etc
13) The locations; where the research is taken place
14) The type of assistance they performed; whether the references explain about the disaster/emergency assistance or development assistance
15) Sample used; if the references made some sampling method
16) Theory; any theory used in the references
17) Collaboration of the institutions; to identify from which institution the papers are published (academia, institutions, NGO, government, or the collaboration among them).
7. Synthesis of the studies and write the review

Finally, to identify and analyze the potential commonalities across the themes and papers, it is essential to conduct the content review. The final output is to synthesize the information and discuss the implications of HASCF to help the reader understand this topic, which is still underdeveloped. We will go further on our literature review.
CHAPTER 4

Findings

Classification of the references

The selected references then are read thoroughly and classified based on several categories to see the dispersion of the papers and to facilitate the analysis of the ‘big picture’ of HASCF. We categorized the documents into nine themes which are related to HASCF. Besides, one paper can also touch several themes. Here is the chart to see how the papers are varied based on the nine themes.

Figure 3.1 Themes of the papers

Approximately 40% of the papers, mostly specify in the paper, whether they will focused on pre/during/post emergency assistance or development assistance. The 16% of the papers still considered the aspect of the logistics that included the inventory, warehouse and storage, and physical distribution of the donation. The 15% of the papers mentioned that they will discussed about the type of donation, thus it could be in-kind donation, monetary donation, or both of them.
The other classifications of the papers are based on the methodology, location, type of assistance, the theory used, sample used, and the type of disaster. Thus, we can see how diverse researchers have put their effort into investigating the field of humanitarian aid. Therefore, generally, we can see the dispersion of the papers. The chart below shows how the documents are varied based on those classifications.

**Methodology**

- The methodology that is used in the papers, we classified them through 5 categories: commentary and analysis, pure analysis, case study, literature review, and combinations. Here we will explain in more details:
- Case study: the papers which presented the real disaster response as their primary data and how they tackled it using the proposed solution they plan. Thus from this case, they managed to figure out the perspectives that they needed to develop it more or to fix it.
- Literature review: when the papers were going through the references and then made some theories and suggestion
- Combinations: the papers used several methods to gain the data. The combinations can be from survey and literature review, or observation and interview, or case study and quantitative study. Also, some papers used more than two methodologies (for example, we have two papers which used three methodologies).
- Optimization: the papers used optimization to find the optimal solution from a case study or sample scenario.
- Statistics: when the paper used the statistics model (in this case, the regression model) by using data from an institution’s database
- Stochastic: when the paper used the stochastic model to see the change in different times or conditions. For example, how the uncertainty of funding will impact on operational costs.
- Experiment: in this case, the paper conducted an econometric analysis to support the test they were performing. The investigation (in this paper) aimed to see the effect of a treatment to the research questions.
**Type of assistance**

Basically, in the beginning, we agreed to classify the types of disasters into two kinds. The two models are the development and the disaster/emergency. Based on the kind of disasters, we categorized each paper and divided it into five categories as follows:

- **Development**: when papers discussed about the refugee, victim of civil war, etc.
- **Disaster/emergency**: when papers address about the earthquake, tsunami, floods, and other sudden onset events.
- **General**: when the papers do not specifically mention the type of disaster but rather than describe a topic that possibly be implemented for the humanitarian aid.
- **Disaster and development**: when the papers indicate that the topic for humanitarian aid are relevant for both disaster and development disasters.
- **Not mentioned**: when the papers do not state about any humanitarian aid but can appropriate for supply chain finance.
**Theory**

The selected papers can be including theories or even not mentioning any theory. Some papers which have no theory emerged from the case study.

**Locations**

The selected papers were investigated from different locations. Some of the documents only discuss about the humanitarian aid that happened in a country. Still, some of them consider in more general terms, the events that occurred in several countries, or even worldwide. The papers that are not mentioned in any location means the papers are commenting on several papers, but not specifically mention where the events occurred. When locations classified as ‘general’, it means that the papers specifically mention the location of the research/report, but mention it as a part of a theory.
**Pre-disaster/post-disaster**

The selected papers are classified based on the event. The papers may discuss the pre-disaster or post-disaster, or even applicable for both.

**Year of the Publications**

The graph shown below represents how the number of papers related to the humanitarian supply chain and finance is increasing through the year. The year starts from 2006 until the first half of
2019. A stable, increasing trend starts from 2012, and reach its peak in 2018, which approximately 27% of the selected references are from 2018.

![Figure 3.7 Trends of the publications by year](image)

**Collaboration of Institutions**

To see the diversity of the institutions involved in the research related to humanitarian supply chain finance, the graph below shows the general picture of the variety. From the chart, we know that most of the references are come from the academia (77%). As an additional concern, there are also institutions that involve directly into the humanitarian aid and response, also simultaneously provide the research about their activities.

![Figure 3.8 Collaborators of the papers](image)
Developing the findings of the topic

Throughout the reading of the final set of papers and determining the nine themes of documents (as we have seen the graph at the beginning of this chapter), we will deeply develop better to understand the context and scope for each theme. We might see the connection between one theme to another. Therefore, we will discuss each theme concerning HASCF.

**In-kind donation and cash/monetary donation**

Burkart et al. (2016) defined the funding systems as organizational structures and activities used to plan, implement, and control funding supply chain from raising resources (monetary funds, physical goods, and services) from donors until the fulfillment of urgent needs using these resources, including the efforts of coordination and collaboration between stakeholders of the funding supply chain. (Ulku et al. 2015) considered that humanitarian organizations face the problems of allocating their limited resources to a multitude of disasters and development programs. Therefore, the allocation of limited funds is associated with opportunity costs in the form of unsatisfied and urgent demand for activities that cannot be pursued simultaneously. The donations and grants, as presented by Russell (2005, cited by Falasca and Zobel, 2011), can be multilateral, collected resources from different countries (that administered by institutions), then redistribute them, or bilateral (by giving directly from donors to the beneficiaries).

Burkart et al. (2016) stated that the source of funding could be divided into two sources: private donations and institutional donations from an organization. There is a challenge in managing the funding systems, depending on the categorization of the funds received. A very common categorization of funding is divided into two: in-kind donation and cash/monetary donation. The monetary donations can be used to procure and purchase the needed resources for the operations. Meanwhile, the in-kind donation can help to avoid the purchasing step.

The authors discussed the restriction about the funding: earmarked donation and non-earmarked donation. Earmarked donations designed to convince the donors that their donations are being used as they intend to be used, thus limiting the range of possibilities to use the funds. But allowing the earmarked donation (in the case of disaster response programs) will result in the reduce cost of fundraising activities of the humanitarian organizations. While non-earmarked, monetary donations provide high flexibility and can be used to purchase any required resources. In-kind donations serve a much lower variety of needs compared to monetary donations that can
be used to buy what is needed the most. Below is the diagram, presented by the authors, concerning the funding form and flexibility.

<table>
<thead>
<tr>
<th>Cash/ monetary donation</th>
<th>Geographical and/or program inflexibility</th>
<th>High flexibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-kind donation</td>
<td>Low flexibility</td>
<td>Need inflexibility</td>
</tr>
<tr>
<td>Earmarked donations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-earmarked donations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 3.9 Impact of the form of the funding on HO flexibility (adapted from Burkart et al. 2016)
Natarajan and Swaminathan (2014) stated in their research that receiving funding earlier is beneficial in underfinanced systems, and avoiding delays in funding is critical. Besides, receiving less overall funding on time might be better than delayed, fully funding.

In other references, Arya and Mittendorf (2015, cited by Burkart et al. 2016) considered the impact of legislation and taxation for the donation and also the donor behavior. In some countries, the company got an incentive when donated in in-kind donations rather than cash/monetary donations because in-kind donations are tax-deductible at the market value.

Various works of literature are questioning whether it is better to donate in monetary donations or in-kind donations. To find a deeper understanding of how in-kind donation and cash/monetary donation can contribute to the whole humanitarian supply chain finance, we will highlight the role of both types of donations. The Several authors: Burkart et al. (2016), Harvey (2007), Ulku et al. (2015), Piotrowicz (2018), Mariacher et al. (2008) and Nelan et al. (2018) mention several advantages when donating in the form of cash/monetary donations:

Monetary donation is cheap and accessible for the donors. In-kind donations may require a delivery cost.

Monetary donation provides high flexibility and can be used to purchase any required resources as long as they are available, unlike the in-kind donations that can incur losses if the goods are close to expiration dates.

The monetary donations do not require storage as the in-kind donations.

Some of the organizations released a guideline recommending the donor in contributing to monetary donations and specifying that cash is the best and less problematic than material donations. This consideration also reflects the implications of the material convergence that humanitarian organizations are commonly facing.

The monetary donations are more efficient since they do not generate the logistical challenge and supply transportation and storage. In addition, monetary donations can be used in the post-disaster local economies.

The possibility of the in-kind donations to be excessive, inappropriate, and also have quality issues.
The material donations sometimes cannot meet with the local culture and environment (the case of the Indian Ocean’s tsunami 2004 when donors donated jackets while the beneficiaries lived in tropical countries).

Cash transfers are likely to have positive impacts on local economies through multiplier effects and are less likely than in-kind transfers to discourage local trade or production.

To have both perspective from the monetary donations and in-kind donations, Harvey (2007) through his bulletin, Islam et al. (2013) through his case-study paper of Superstorm Sandy relief, Heaslip et al. (2018) and Piotrowicz (2018) point out some benefits of giving the in-kind donations, such as:

In-kind donation cannot be used for ‘anti-social use’. Monetary donations or cash donations are prone to ‘anti-social use,’ which may be the cash will be used to buy alcohol.

In-kind donations do not need any additional finance capacity.

In-kind donation can directly meet the immediate comfort for the victims, such as socks, thermal clothing, blankets, sleeping bags, heater, etc.

An in-kind donation is more visible than cash/monetary donation. Thus it is easier to quantify the results to donors.

In-kind donations are suitable for cross-border delivery and for providing goods that are unavailable or too expensive locally.

In-kind donations are suitable support for vulnerable groups in society (e.g., older people with lower mobility and limited access).

In terms of delivering the aid, Ertem et al. (2010) emphasize after the disaster strikes, the professionals from humanitarian organizations are deployed to the disaster locations and estimate the supply requirements in the area. Within the first 36 hours after the disasters, appeals (that are defined by the type and quantity of relief supplies) are released to humanitarian organizations, government, and international NGOs. The in-kind donations need to be prioritized, sorted, counted, and compared with the current demand. Cash donations might lead to procurement activities that turn into delayed delivery to the disaster locations, but do not have the burden of in-kind donations.
Nelan et al. (2018) set further research related to the agility in disaster relief. They interviewed with both small and well-established humanitarian relief organizations in answering the doubt whether to donate in monetary donations or in-kind donations. They found out that there’s no consensus on when the monetary donation was more effective than in-kind donation since, some organizations prefer to contribute on monetary terms, but some are not. Cash and in-kind donations were both having a role at a different time in the disaster supply chain. Based on the research, most of the organizations find that the in-kind donation is preferred in the initial relief stage.

**Humanitarian relief procurement**

The purpose of humanitarian procurement is to ensure the humanitarian relief organizations have sufficient supplies to meet the needs. Taupiac, (2001, as cited by Falasca and Zobel, 2011) divided humanitarian procurement activities into two categories: for the development aid and disaster relief. The procurement for development aid focused on long-term social-economic development, which allows the process of evaluation and bidding procedure as commonly occur during the commercial supply chain. Meanwhile, the disaster relief aims at the speed and availability, intending to save lives.

The procurement operations are essential for disaster relief operations due to pre-positioned or inventories may not enough to support the whole relief operations (Ertem et al. 2010). The concern of procuring locally or internationally also presented by the Pan American Health Organization (PAHO, 2001, cited by Falasca and Zobel, 2011), stating that local procurement might help to stimulate the local economy as, lower transportation costs, and shorter delivery time. Several considerations arise when determining the local suppliers: the quality and the risk of competition between the organization that resulting in a shortage. On the other hand, by procuring internationally, the organizations have access to large quantities, lower prices, and guaranteed quality, with acceptable delivery times and transportation costs. For example, the International Federation of Red Cross (IFRC) has agreements with global suppliers to consistently provide items such as blankets, tents, and medical kits (Sowinski, 2003, cited by Falasca and Zobel, 2011). Besides, during the case of Yogyakarta’s earthquake relief, IFRC signed a pricing agreement with pre-selected suppliers for the essential items (e.g., blankets, and plastic sheets). Murray added that the same strategy also applied by many relief agencies, in which they have pre-purchasing agreements with suppliers of drugs, tents, sheeting, or blankets (2005), cited by Kovacs and Spens, 2007). The pre-selected suppliers were familiar with the
organization’s requirement and quality, thus committed to keeping a pre-determined stock (Gatignon et al. 2010).

The humanitarian relief is prone to uncertainty, as well as its procurement activities, due to sudden-onset disasters, donor funding characteristics, procurement procedures of relief organizations, and limited information (Balcik et al. 2009). Falasca and Zobel (2011) conducted an optimization model to perform the alternative, which allowing decision-makers to deal with uncertainty parameters that usually happen in procurement activities. Procurement in humanitarian relief also faces uncertainty, which rooted in the funding and the demands. The authors presented the procurement activities increase as the level of donations increase, which in turn will reduce the level of relief shortage, and so the vice versa. The ability to capture uncertainty in a disaster relief situation can support better, effective, and efficient procurement plans.

Considering the expenditure in humanitarian relief logistics, as stated by Blecken and Hellingrath (2008, cited by Falasca and Zobel, 2011), procurement activities account for 65% of total expenditure. As a result, the decisions need to be considered wisely, for example, the decisions on procurement (where, what, when, and how to buy) and the distribution to the beneficiaries (Piotrowicz, 2018). The determination to procure locally needs to consider several aspects. Piotrowicz (2018) expressed the need for local partners and knowledge to develop the local procurement. Kovacs and Spens added, local procurement creates the “pull” supply chain, shortened the chain by reducing transportation and cutting out several parties, thus enabling to have a better response to local demand and reflect cultural and dietary differences (2007, cited by Piotrowicz, 2018). Procuring locally also shortens the information flow, response time and improves supply chain agility (Oloruntoba and Gray, 2006, Oloruntoba and Kovacs, 2015, cited by Piotrowicz, 2018).

Based on the research conducted by Piotrowicz (2018) during the Eastern Ukrainian conflict, the local procurement was able to support both the cash-based assistance and in-kind donations. The IDP (internally displaced persons) who were lived close to urban centers they were able to use the advantages of cash-based assistance and local procurement with the support of the banking system and telecommunication infrastructure. The local procurement was beneficial because of the reduction in transportation costs through various grants, and most of the goods can be procured locally. The local procurement also supports the in-kind donation, for those who were not able to use the cash-based programs, to receive the collective use (e.g., canteens and hospital,
winter’s kit, and stationaries). Procurement rules should look for the overall effect of the region, not merely price and quality.

As stated by Schultz and Soreide (2008) suggested that the beneficiaries and/or their representatives should be informed about the procurement process and provide input to procurement decisions, since the community also worked with the aid staff to design houses, select materials, and equipment, labor, vehicles, and warehouses. Besides, in the whole of supply chain management, the coordination between actors should be fully considered in the whole process. Furthermore, this kind of collaboration can effectively prevent some of the more common forms of corruption in humanitarian procurement, such as the mixing of sand or saltwater with cement.

**The risk of corruption**

The risk of corruption occurs in several aspects of humanitarian aid. It can be according to the kind of donations and the procurement’s phase. After considering the two perspectives of the monetary donations and the in-kind donations, the attention of the common risk of funding the donation for the humanitarian aid cannot be neglected. The corruption is one of the risks. Maxwell et al. (2012) stated that although finance audits, human resources, fleet management, and supply chain management also entailed a significant risk of corruption. Procurement was commonly mentioned as the activity with the high risk of corruption. Ewins et al. (2006, cited by Heaslip et al. 2018) added that the corruption risks for in-kind donations are higher than the cash/monetary donations. The reason is the in-kind donation has the phase of procurement, warehousing, and transport, which is not applicable to cash transfers in the same physical way.

During the procurement phase, Schultz and Soreide (2008) researched finding how corruption during procurement can come about. The authors also divided the categories of the corruption into two: the misuse of legitimate derogations from the laws, and hidden violations of procurement rules. The misuse of legitimate derogations from the rules can happen since there was a need to be flexible and rapid purchases that it can be easier to purchase to one specific supplier without attracting suspicion. Several other specific ways to do these are:

- exaggerated emergency: procurement officials can abuse fast-track ‘emergency’ procedures as a cover for corruption.
- misuse of discretionary power: authority to determine and communicate the public’s needs and preferences without comparing alternative prices and qualities available on the market),
• misuse lax requirement for written justifications, especially during an emergency: when procurement officers know that the expectation of such reporting is low. At the same time, post-emergency evaluators are unlikely to have the information needed to assess any justification.

Soreide and Schultz (2008) also added that the hidden violations of procurement rules could occur in a way when making all the procedures are respected. For example:

• Limited invitation: the call of the bids might be a limited number of suppliers, or very late. Bribing the supplier is the only firm that will be informed to make a bid.
• Shortlisting/pre-qualification: the inclusion of a shortlist provides an opportunity for a procurement officer to receive bribes.
• Evaluation criteria and choice of technology: match the evaluation criteria with qualities of the bribing firm to make the procedure appear as the rules have been respected
• misuse of confidential information: firms may offer bribes to acquire confidential information of the other candidates’ bids.
• political and diplomatic pressure: domestic politicians may have personal or professional ties to specific firms and may misuse their authority

The corruption of the procurement depends on several factors and opportunity. The way corruption is conducted depends on the circumstances. Here are several corrupted acts: poor quality tents, drugs with low quality or expired, the intention of the customs to hold some urgently required medical supplies to extract a bribe, and falsification of receipt/paperwork. The corruption even occurs during the operational activity. For example, officers exaggerate kinds of products and services supposedly required for personal benefit, or they directed the supplies to certain areas, not to the urgent locations)

Schultz and Soreide (2008) emphasize several factors that affected opportunities for corruption, such as:

1. Size and location of the contracts: the results of the interview conducted by the authors, the “on-the-spot” procurement is more prone to corruption than if the headquarters handle it.
2. Complexity: corruption will be easier to cover with more technology involved.
3. Discretion: the more procurement officers have their policy, the act to cover the improper influence over their decisions will be more accessible.
4. Reduced financial controls: during the emergency, it will be more effortless for the individual to exploit the opportunity of corruption.

5. Increased demand for emergency supplies: the more pressure, then it will be accessible to conceal the act. As the emergency rise, the prices soar, bribe, and other improper costs will be hard to detect.

6. The pressure to spend: during the emergency, the aid agencies experience pressure to spend the donations quickly. As a consequences, it will be more favorable to work with significant contracts with few suppliers rather than many small contracts.

7. Country or emergency: The Transparency International ranks listed the corruption levels of all nations. The chance of corruption is high in the given country, in which corruption is considered as a significant problem and during the emergency situations.

8. Agency experience in the country/sector: the expatriates can have limited knowledge with the local market, thus asking the staff to procure unfamiliar items (e.g., when a child protection agency takes on a latrine-building project). This situation can be an advantage for the individual to conduct a corruption act.


The authors also suggested four ways to prevent corruption, especially in the procurement levels:

1. Preventive at agency level: reducing the need for “on-the-spot” procurement and increasing the professionalism among the personnel, especially during the emergency procurement.

2. Beneficiary participation: involving the beneficiary regarding the procurement activity. By informing the procurement can prevent the standard form of humanitarian corruption. Cash and voucher also mentioned by the author as an alternative to avoid corruption practices.

3. Monitoring and evaluation (in terms of ensuring adequate budget and capacity): In procurement terms, the “real-time evaluations” concepts that are developed by UNHCR can be a beneficial tool to identify and correct problems during the procurement process.

4. Sanctions: the punishment of administrative penalty at the agency level and national courts can be an effective way to bring down the risk of corruption.
Voucher, as presented by Heaslip et al. (2018), is a paper, token or electronic card that can be exchanged for a set quality or value of goods, denomination either as a cash value or as predetermined commodities or services. Vouchers are redeemable with preselected vendors or at “voucher fairs” set up by the implementing agency.

The role of information technology and digital technology role in HASCF

Information and digital technology play an essential role in the whole humanitarian supply chain. Start from spreading the news of the relief aid, technology in providing the donation, to the technology in minimizing the intermediaries and provide more accountability and transparency. A case study performed by Piotrowicz (2018) described the case of Polish humanitarian NGOs and during the Eastern Ukrainian conflict in 2014. The author stated that the in-kind donations were distributed through convoys and caught media attention. Convoys were used to raise media awareness and media coverage and to report this event to all media channels. This step thus initiated different actors in pursued their views and interests.

The paper by Islam et al. (2013) discussed the advantages of exploiting the digital technology (Amazon e-commerce platform) for reducing unsolicited donation during the first step relief of Super-storm Sandy in 2012. The idea emerged because Amazon provided the most needed items for the early stage of the response, such as blankets, socks, batteries, trash bags, etc. This initiative was published through social media networks (Facebook and Twitter), blogs, radio shows, newspapers, and others. Within 72 hours, people donated over 10,000 items valued over $200,000. By doing this, the volunteers were able to control the flow of the donations since the donation was registry with online retailer providers.

The author emphasized that the similar platform already established in 2007 named Aidmatrix Network, a central donation portal management. This portal allows NGOs and donors to post and respond to the beneficiaries. In addition, through this portal, they can match the donor offers with the NGO needs (Islam et al., 2013). Mejia et al. (2019) added that the online crowdfunding emerged as a new alternative to raise funds for emergency response.

As to Heaslip et al. (2018) reported in their paper, some of the leading humanitarian donors and organizations including Red Cross, Red Crescent Society, Oxfam, and the World Food Programme, have started systematically experimenting and learning by funding cash and voucher-based innovations instead of delivering finished products to beneficiaries. But, the voucher mechanism only limited the beneficiaries with specific items or only valid for one supplier. More advanced technologies are also supporting the initiative of the voucher. The pre-
paid cards are becoming more popular as it gives a higher choice to the beneficiary and can be programmed to be valid with more than one supplier (and thus removes the risks of monopolies). The technology is showing its role to assist people, and mobile phones are another delivery mechanism for humanitarian aid since the mobile phone already has a high percentage of ownership in even the poorest countries.

The idea of exploiting the mobile phone to support the humanitarian practices happened in practice when in 2007. Monks (2017, cited by Wang et al., 2019) described the initiatives held by Vodafone. Vodafone launched a program named M-PESA in Kenya. This program allowed people in Kenya to transfer funds quickly and easily. In 2017, there were 30 million users in 10 developing countries included international transfers, loans, and health provision. It took ten years for M-PESA to reach large-scale development. This initiative was appreciated since 2% of Kenyan households were lifted out of extreme poverty through the mobile money services.

To work with transparency and financial tracking, several papers, for example: Ko and Verity (2016), Zwitter & Boisse-Despiaux (2018), Jayasinghe et al. (2018) and Wang et al. (2019) suggested the blockchain as one of the alternatives in providing more transparent work and increase transparency between the stakeholders. Yet, this initiative still needs more research to be conducted. Blockchain is a distributed database shared across multiple participants. The information on the blockchain is distributed, transparent, tamper-proof, traceable, and secure (Ko and Verity, 2016). The authors added that the feature of “smart contract” in the blockchain. The “smart contract” is a computer protocols that allow us to facilitate, verify, and enforce the performance or negotiation of a contract, which then will automate the process and eliminating the contract registration, monitoring, and updating efforts. In the aspect of the humanitarian sector, the “smart contract” can be used to tie funding or transaction based on agreed rules, ensuring all parties able to hold the accountability. Besides, Kshetri (2017, cited by Zwitter and Boisse-Despiaux, 2018) underlines that since blockchain can promote transparency, thus it will reduce fraud and corruption, reduce barriers and costs related to property registration, and enhance efficiency in business-to-business (B2B) practices.

Ko and Verity (2016), as well as Wang et al. (2018), described the benefit and the challenges in exploiting the blockchain technology. To give a deeper understanding of how the blockchain works, here are the two perspectives in utilizing the blockchain.
<table>
<thead>
<tr>
<th>No</th>
<th>Benefit</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Distributed: engaged each actor directly and eliminated the 3rd party intermediaries.</td>
<td>Internet access and infrastructure</td>
</tr>
<tr>
<td>2</td>
<td>Lower transaction costs as a result of 3rd party intermediaries removal</td>
<td>Relatively new technology, thus it will be difficult to recognize the full implications and potentials</td>
</tr>
<tr>
<td>3</td>
<td>Faster transaction times</td>
<td>Scalability limitations: blockchain can be scaled only within its current users.</td>
</tr>
<tr>
<td>4</td>
<td>Transparency and accountability: blockchain offers unalterable public ledger.</td>
<td>Technical barriers in understanding blockchain technology</td>
</tr>
<tr>
<td>5</td>
<td>Usage information and traceability</td>
<td>Reputational risk of Bitcoin</td>
</tr>
<tr>
<td>6</td>
<td>Data security through encryption</td>
<td>Social, legal and regulatory challenges</td>
</tr>
<tr>
<td>7</td>
<td>Extended visibility and product visibility: real-time tracking and traceability enable the supply chain is fully auditable (thus can be a solution for medicine or food counterfeiting)</td>
<td>Operational challenges: blockchain comply with various laws and regulations.</td>
</tr>
<tr>
<td>8</td>
<td>Donation provisioning: when the banking system of the country’s warzones is subject to sanctions, bitcoin payments bypass the banking system and reach the target</td>
<td>The cost of implementation and participation may be issue due to technical and specialized expertise requirement.</td>
</tr>
</tbody>
</table>

According to Ko and Verity (2016), blockchain technology can be used in the humanitarian sector, such as protected data sharing, identification and documentation, supply chain, donor financing, cash programs, and crowd-funding. Also, this technology provides a decentralized, verifiable source of data, thus enabling a more transparent, efficient form of information and data management. Here we will see deeper how each benefit can support the humanitarian aid:

- **Protected data sharing**: time-stamped and digital verified information hosted the accessible ledger to play an essential role in reducing the costs (since we will not require any 3rd party intermediaries). This idea also possible to increase humanitarian transparency data (since different humanitarian agencies can collect and share data on the same network). The use of blockchain will ensure data security and improving coordination, as we have more transparency data. It is also possible to trace the owner of
each data, and this sharing platform can potentially build upon existing humanitarian sector database systems, such as OCHA’s Humanitarian Data Exchange.

- **Identification and documentation:** humanitarian response faces a challenge in lack of identity documentation, while it is necessary to obtain one’s identity to get essential humanitarian assistance and reach areas of safety. Also, blockchain protects information using encryption. This technology can protect personal data to those who are most vulnerable.

- **Supply chain:** the supply chain of humanitarian aid is agile and dynamic. By increasing supply chain transparency can better improve the humanitarian operations by providing data to inform more effective and accurate decisions. By giving visible public ledger, this platform can track “what went into the product and who handled it” along the way of the relief.

- **Donor financing:** the blockchain initiatives will cut out the intermediaries and resulting in cost saving. The idea will result in better visibility and transparency in financing, so enabling the actors to recognize the funding gaps, misuse of funds, and corruption.

- **Cash programs:** According to Overseas Development Institute, (2015, cited by Ko and Verity, 2016) cash-based program is widely employed among humanitarian actors and expected to rise in the future. Digital cash program has been a critical recommendation for cash-program practitioners as this practice ensures greater transparency on how much aid reaches the affected population, cheaper payments, accelerate financial inclusion, and increase security.

- **Crowdfunding and micro-financing:** through using the digital currencies, it is possible to provide a decentralized funding platform. The crowdfunding humanitarian programs already use Bitcoin and other cryptocurrencies to fund humanitarian emergency. Several platforms (e.g., Colu, BTC Funding, and BitPesa) have lower transaction costs while also ensuring transparent and rapid disbursement of funds during crises. By doing so, it will also eliminate the intermediaries to monitor and disbursed funds. The funds will be processed on a peer-to-peer basis, then it will be approved and transferred directly to the recipients. The humanitarian sector also could establish the dedicated cryptocurrencies to reduce transaction time and exchange-rate losses.

Zwitter and Boisse-Despiaux (2018) also Wang et al. (2019) underlined the blockchain initiative is already being used in development aid relief, such as: securing digital identities, improve land
tenure and property right, and gender equality. The examples are also linked with the previous statement from Ko and Verity (2016). The examples are:

1. The blockchain’s initiatives were able to provide refugees in Lebanon with digital identities and connected them with vouchers to buy consumer goods (Gorey, 2016, cited by Zwitter and Boisse-Despiaux, 2018). This example is match with the identification and documentation benefit of blockchain presented by Ko and Verity (2016).

2. UN Office is using the blockchain’s digital identity application for Project Services (UNOPS) who launched a pilot project in Moldova to protect children and women from human trafficking (Sundararajan, 2017, cited by Zwitter and Boisse-Despiaux, 2018). The initiatives associated with the cash program of blockchain mentioned before.

3. The blockchain can allow women to access microloans or secure money transfers among women entrepreneurs (UN Women, 2017, cited by Zwitter and Boisse-Despiaux, 2018).

4. Ethiopia launched a pilot project based on blockchain. This notion was able to give all the stakeholders (farmers, roasters, and consumers) to access the data (including price) across the entire supply chain. These practices count as the opportunity to balance small producers and large wholesalers, fair distribution, and reduce poverty (Wang et al. 2019).

5. In the refugee camp in Jordan, people receive food from local supermarkets by using eye scans instead of cash, vouchers, or cards, which allows the future humanitarian supply chain to enhance the agility and responsiveness (WFP, 2017, cited by Wang et al., 2019).

Not only media, crowd-funding, mobile money services, blockchain, and e-commerce, and online platform network support that support the practices of humanitarian, software also plays a vital role in humanitarian relief. The Fritz Institute (a nonprofit organization that works in partnership with governments, nonprofit organizations, and corporations to innovate solutions and facilitate the adoption of best practices for disaster response and recovery) launched the software in 2007 named HELIOS. The Fritz Institute and some NGO (e.g., World Vision International and Oxfam, etc.) have started to implement this software to pilot project humanitarian operations. HELIOS has a procurement module, including purchase requisition, request for quotation, comparative bids, and analysis activities (Ertem et al., 2010).
Financial tracking and tracing in HASCF

As discussed before that exploiting the digital technology, notably blockchain, will enable us to do the financial tracking and tracing. As we have mentioned before in the introduction, the transparency is essential as donors willing to know more about their donation and ask for more transparency and accountability (Salvado et al., 2018). Financial tracking and tracing provides a valid platform and resulting in more accountability and trust among the humanitarian actors. Increased trust during the project will ensure continued donor engagement (Ko and Verity, 2016).

Mejia et al. (2019) underlined that the online crowdfunding campaigns include the information about the organizer, the purposes, the financial goal, and the timeline. But to attract more donors, this new alternative needs to use two transparency tools: updates (for operational transparency) and certifications (conventional transparency). The operational transparency (updates) is the act of revealing the work behind the system or services. While the conventional transparency (certifications), refers to an organization’s disclosure of legal and financial information to the government to obtain certifications as a charity.

Regarding the operational transparency (updates), Buell et al. (2016, cited by Mejia et al. 2019) find that when the government is transparent by showing their work, it will achieve the citizen’s trust and their engagement as information providers. Besides, the conventional transparency (the certification) can improve the reputation and economic benefit of the organization (Podolny, 1993 and Rao, 1994, cited by Mejia et al., 2019). The organization will be able to improve the usage of donation, better service delivery to the beneficiary, and more responsiveness when they are transparent (Mejia et al., 2019).

The research experiment was developed by the Mejia et al. (2019) by using econometric analysis with over 100.000 campaigns for emergencies in 2019. The updating activity was able to increase the donation by $65/month, and the certification was able to increase the donation by $22/month. The private donors need to be informed about the organization where they donated their money.

The experiment result of Mejia et al. (2019) indicated that being transparent is a crucial activity, especially in a crowdfunding platform for emergency response. The certified crowdfunding campaigns and keep the donor informed will positively influence the donations. Two mechanisms explain the increased effect of work-related updates on donations: donors’ increased perceptions of effort and perceptions of trust.
UNOCHA also developed a tracking and tracing platform named Financial Tracking Services (UNOCHA). This platform is a centralized source, which curated, continuously updated based on data and information about humanitarian funding flows. The platform compiled the comprehensive information and reported it to fts.unocha.org. The information such as where funds come from, where the funds are going, and progress on appeal are available in this platform. The government, UN agencies, NGOs and other humanitarian partners can exchange data and information with this platform to see their visibilities of their financial contributions, see the current updated humanitarian funding flows between donors, and monitoring the funding progress. This platform provides transparency to the donors and communicating the gaps. By being informed with the current flows of the funding, the communities can better allocate the humanitarian response (UNOCHA).

![Figure 3.10 The overview of financial tracking services by UNOCHA (fts.unocha.org)](image)

**Supply chain finance in humanitarian relief**

Vaillancourt et al. (2018) underlined the importance of the organization to make most of its limited resources since they have the gap between high costs of humanitarian logistics supply chain management (LSCM) and funding available. This statement is relevant to the condition we have described in the introduction part regarding a gap between the funding received and funding requirements. The research conducted by the author presented a further understanding of the drivers of efficiency in humanitarian supply chain finance and the impact of health programs design on supply chain costs. The authors argued that there is a need for an improved framework to capture the cost drivers of LSCM response. Besides, the authors mentioned a metrics that is picturing the components that will affect the supply chain cost per beneficiary. Balcik and
Beamon (2008, cited by Vaillancourt et al., 2018) use this metric and considered this as a relevant measure of efficiency in humanitarian LSCM.

![Figure 3.11 Metric of supply chain cost per beneficiary (adapted from Vaillancourt et al., 2018)](image)

Based on the metric above, the Vaillancourt et al. (2018) conducted research that captures the relationship between 9 factors and the supply chain cost per beneficiary. Six of these factors were adapted from Tatham et al. (2013), and the authors added three other factors (remote, landlocked countries, organization type UN, and vertical delivery). They tested the factors with the regression model used the sample of 129 projects from OCHA’s database. The results showed as the number of beneficiaries increased, it would affect the decrease of supply cost per beneficiary. But the supply chain cost per beneficiaries would increase as the number of beneficiaries reached a certain value. If we discussed the organization type, it showed a reduction in supply chain costs per beneficiaries for project plans proposed by NGOs. NGOs will have less LSCM costs compare to UN agencies because the UN needs to cover a wider area (UN works at an international level).
The remarks of the research were the beneficiary, and NGOs are quite affecting the efficiency of the health project. Also, the internal (organization type) and external considerations (the development level and number of beneficiaries) are relevant for LSCM cost per beneficiaries in health project (Vaillancourt et al., 2018).

**Logistics in HASCF (inventory, storage, and physical distribution)**

The identification of needs has a significant impact on the logistics decisions. The performance of the logistics decision would be varied from the type of the commodities (food, clothing, shelter materials) and the different phases of the response action because the disaster may affect the infrastructure (da Costa et al., 2012). Beresford and Rugamba stated that the emergency humanitarian logistics would require the involvement of government and NGOs as well as the use of transport modes (1996, cited by Oloruntoba and Gray, 2006). The characteristic of the delivery supply chain and management that being the additional and unique challenges to humanitarian aid and disaster relief according to Balcik and Beamon (2008), were:

- Unpredictability of the demand (timing, location, type and size of the items)
- Sudden-occurring demand in huge amount and short lead times for a wide variety of supplies
- High stakes associated with adequate and timely delivery
- Lack of resources (sourcing, people, transportation, money, and technology).

The papers considered touch the field of logistics scoping the sub-theme of inventory, storage, and physical distribution. This section will discuss further on each of the sub-theme.

- **Inventory**

The humanitarian supply chain associated with uncertainties. The research regarding inventory management in the context of humanitarian relief is focused on warehouse management (e.g., determining the size and frequency of orders and level of safety stock). The literature mostly presented the mathematical model on how to minimize the inventory costs, improved flexibilities, and reduced response time (Falasca and Zobel, 2011). Balcik et al. (2016) stated the fundamental questions of inventory management are the same both for humanitarian settings and the commercial supply chain; how much to order, when to order, where to store. But, due to the characteristic of humanitarian settings, the policies and models for commercial supply chains may not directly applicable to the humanitarian supply chain. Balcik et al. (2016) mentioned several features of inventory management for humanitarian settings, such as:
1. Objectives: improving customer services, decreasing inventory costs, and satisfying beneficiary needs. Here the efficiency objectives which usually apply for commercial supply chain are not applicable for humanitarian organizations.

2. Ownership: challenging to determine the stock on-hand since the inventory of humanitarian settings might have multiple owners (e.g. governments, private donors).

3. Demand: the high level of uncertainty may lead the significant challenges in developing effective inventory policies.

4. Infrastructure: the damaged infrastructure in the disaster site may prevent the organizations from using the technology to track and manage inventories

5. Financial resources: humanitarian organizations may not have financial resources to keep and manage inventory

6. Sourcing: purchasing from local suppliers usually is preferred to support the long-term economic development of the affected region

Having reviewed the feature of humanitarian inventory management, Balcik et al. (2016) also described the pre-disaster and post-disaster inventory management. The pre-disaster management mostly focuses on long-term pre-positioning decisions which including the emergency relief supplies at strategic locations before the disaster occurs and also determining the amount of relief supplies to keep in the network along with the locations and storage facilities. The humanitarian organizations are the decisions maker. But, with the high level of uncertainty, it’s challenging to make the pre-positioning decisions. A variety of emergency relief such as: blankets, medical kits, and hygiene kits may have different demands of each item. Therefore, a study by Hong et al. (2015, cited by Balcik et al., 2016) proposed those items to be considered as one single bundled commodity.

Balcik et al. (2016) continued with the post-disaster inventory management. The humanitarian organizations are still the decisions maker. Although most of the studies focus on humanitarian organizations as the decision-maker assumes a setting with a single organization. Still, there are many examples in which multiple organizations stock inventory at the same warehouse coordinated by a separate umbrella organizations. The post-disaster decisions mostly consider the shipment of the supplies to the beneficiaries and replenishment policies. Most of the post-disaster studies avoid decisions regarding facility locations and sizes. The reviews would consider the single facility without capacity limitations and aim to adopt replenishment policies. The vendor-managed inventory (VMI) system was also could be considered during the post-disaster shipment and was made by the manufacturer. In this way, the government could pay the
pharmaceutical company (for example) to produce and store extensive inventories for perishable health supplies.

- **Storage**

The unsolicited donation is the key challenges for humanitarian relief organizations. Over the years, many NGOs have invested time and logistics resources regarding the donations and found that most of the donations could not be used for relief purposes and accumulated the site, thus resulting in the ‘second disaster’ (Islam et al., 2013). The in-kind donation has a strong connection related to the unsolicited donations. PAHO (2001) discussed about the three categories of in-kind donations types:

1. Priority 1: urgent, for immediate distribution
2. Priority 2: non-urgent distribution, not immediately required but will be useful for later stage of emergency
3. Non-priority: non-priority goods, non-urgent distribution. Items that have been damaged, expired, or doubtful value. These items need to be put aside and may clog the logistics network.

Burkart et al. (2016) added that unsolicited donation could be ranged from the management of unexpected but useful goods to goods donors donated as their unused surplus, the products that were not meet the standards (expired or damaged) and consume storage capacities. Islam et al. (2013) emphasized that the ‘second disaster’ can be resulting in several activities in humanitarian relief, such as:

1. Transportation: unsolicited donations create significant problems for the transport of relief supplies, especially in developing countries.
2. Supply uncertainly and lack of visibility: unsolicited donations are often sent without prior notifications. The site of Superstorm Sandy (2012) reported to receive donations without prior agreement with relief agencies. Burkart et al. (2016) added that unsolicited donations could have a detrimental effect on operations when they can clog the supply chain.
3. Unproductive use of NGO staff and volunteer time: the NGO staffs need to sort the mixed supplies of donated products. The case of hurricane Katrina left the NGO staff and volunteers spend hundreds of hours sorting through the donated items.
4. Disposal of unwanted donations: when it comes to the disposing of the items, it even more difficult since discarding expired pharmaceutical or other medical items would need orderly disposal.

- Physical distribution

The immediate need to act on several activities simultaneously is a challenge for humanitarian action in response to the disaster. Evacuation, damage control, and supplying medical aid need to be performed simultaneously. The transportation’s capacity may prevent the dispatch of the relief goods to occur rapidly (da Costa et al. 2012). As mentioned before, the ‘second disaster’ can influence the transportation as well. The unsolicited donations also affected the shipment, for example, Islam et al. (2013) stated that during the case of the Indian Ocean tsunami 2004, the accumulation of unusable donations blocked the incoming relief supplies and almost closed down the Sri Lanka’s Colombo international airport.

Another challenge would be the rugged geography and affected region that may influence the “last-mile” distribution. The suggestion of making the distribution points to minimize the distance for the beneficiaries in community centers (e.g., clubs, churches) came up to cope up with the “last-mile” delivery challenges (da Costa et al. 2012).

The border crossing issue was another challenge for physical distribution. During the case of Eastern Ukrainian conflict 2014, Poland helped Ukraine by donating in-kind goods and transported by trucks, and this shipment could take days due to the customs procedures. Due to the long time needed regarding the border crossing, the in-kind donations would need additional requirements such as long expiry dates for foods, and clothes must be new as the costs for disinfection were higher than the value of the shipment (Piotrowicz, 2018).

Unlike the in-kind donation, cash-based response does not require the warehouse, customs clearance, and transportations, which all of them are the significant aspects of logistics (Heaslip et al. 2018). During the case of Eastern Ukrainian conflict, cash-based assistance was used to supporting the families, such as pay the rent of the apartment and winterization (buy the needs for winter such as bedding, warm clothes, heating for an apartment). The cash-based assistance also then came up with the suggestion of providing the families with cards issued by the bank with still the same purposes (Piotrowicz, 2018).
The strategy applied also affected the distribution systems (e.g., centralization or decentralization). IFRC once performed a shift from centralized supply chain design to decentralized supply chain design when responding in Yogyakarta’s Earthquake in 2006, which located in Indonesia (Gatignon et al. 2010). During the centralized supply chain designed, most of the action was managed by headquarter at Geneva, the relief items needed to be transported by multiple flights or transatlantic shipments. On the contrary, the IFRC needs to work faster, better, and cheaper. Thus, rather than reacting to the crisis, IFRC needs to be prepared for disasters since better preparedness would allow IFRC to reduce the operation costs. With practicing the decentralization supply chain design during the Yogyakarta’s Earthquake, the IFRC established three regional logistics units (RLU), which would be responsible for delivering the mobilization, stocking, procurement, and fleet services within the region. Besides, they would be able to preposition its goods and allow quicker regional supply in its emergency phase. As a result, the Yogyakarta relief operations counted as a successful decentralized supply chain and dramatically faster, cheaper, and better compared to the Indian Ocean tsunami 2004 and Pakistan earthquake 2005. In 3 days, the supply chain became entirely operated, and in 2 months, 80% of affected families provided with partial relief package (Gatignon et al. 2010).

**Forecasting in HASC F**

Taking preparedness actions in advance of a disaster can be useful for saving lives and reducing emergency response costs (de Perez, et al., 2016). The forecasting act can be both for the technical preparations and funding preparations. For example, de Perez et al. (2016) performed research regarding the action-based flood forecasting for triggering humanitarian action. In their study, they determined the “danger-level” to trigger the humanitarian response. This modeling would allow some preparedness action even for the small flood that would cause a minor impact, and also identify the forecast probability that will make it worthwhile to do the preparedness actions.

The food donation program also used the forecasting method. A research conducted by Davis et al. (2016) was trying to analyze the behavior of in-kind donation food at the three levels: network, branch, and donor. The network-level represented the uncertainty across all branch warehouses. The branch level expressed the uncertainty at the branch level by aggregating across donors. The highest level is associated with the donor in terms of the amount of surplus food that is provided. Here is the map presented by Davis et al. (2016).
Davis et al. (2016) found that the forecasts generated at a network rather than a decentralized branch level are more accurate. The forecasting data supported the authors to suggest several actions that the humanitarian organizations would be able to perform, such as:

1. Mitigate item shortage; since the supply shortage commonly happens, the forecasting information would be able to support a better understanding of items needed over time. As the consequences, the donor activity and quantities would be able to match the beneficiary needs.

2. Enhance storage utilization; as we have discussed before, the space can be a challenge for humanitarian organizations as well as inventory management. The forecasting information aims to provide high on-shelf availability and minimizing the time expiry. Also, timely and precise donation predictions could improve and inform storage decisions.

3. Purchasing decision improvement; in support of better visibility, the humanitarian organizations would be able to lead better overall yearly purchasing decisions in a dynamic environment.

4. Improve downstream distribution decisions; better prediction about time and quantity of the forecasting would help to make the proper distribution, item needs, and considerations.

Burkart et al. (2016) added the benefit of forecasting in terms of funding would improve the funding predictability, thus which related to the importance of predictability of donations.
The supporting finding of the topic

After discussing the finding in the references and describing each theme in the context of humanitarian aid, we will consider the implications for HASCF of the practical activities performed by one of the leading humanitarian organizations in the world that will enhance our understanding of this topic. This supporting finding will mainly discuss the UNOCHA and the other connected entities. Moreover, this section also will describe about the crowdfunding and its mechanism in light with HASCF, and finally, the role of military services in humanitarian aid.

The funding flow of the UNOCHA

The UNOCHA is known as the UN entities responsible for fully engaged with the humanitarian activities, starts with the databases of the disasters or development aid, the financing methods, the mechanisms, and also coordinating with local agencies to deliver the assistance to the beneficiaries. UNOCHA works with many entities, including the government, the companies, the agencies, and individual donors (UNOCHA)

The UNOCHA managed the donation both for the in-kind and cash donation. For the in-kind donation, the donation needs to meet with the current needs of the affected countries, accompanied by documents and proper packaging. Before sending the donations, it is necessary to consult with the focal point for advice on whether the proposed relief items are required and appropriate or the affected population. Some regulations need to be followed as well, for example, the donation for infant needs coordination with local health authorities and UNICEF, also the items that are not suggested to be donated (as it will clog the transportation channels). The recipient of the donation in the affected country should be declared to receive and responsible when receiving the aids. Therefore, a complete document will result in a quicker donation to reach its destination. Not only the items in-kind donations, but the UNOCHA also managed the regulation related to support from the expert services and volunteers. The regulations are published online, and the donors need to follow the requirement when engaged with the services from the experts and volunteering activities (UNOCHA, 2010)

Regarding the cash donation, UNOCHA managed the fund with pooled-fund allocations. Generally, they allow the governments and private donors to pool their contributions and will count as non-earmarked funding. They led the contributions through 2 designed allocations, named: Country-based Pooled Funds (CBPF) and Central Emergency Response Fund (CERF). The donations collected in these two pooled funds will count as non-earmarked funds. Although
the UNOCHA has two pooled funds, but these funds aimed to complement each other, especially in the country level (UNOCHA).

CBPF set up for complex emergency. The contributions are collected into single non-earmarked funds and managed locally under the leadership of humanitarian coordinators (which composed by humanitarian coordinator and resident coordinator). The funds support the highest-priority project of best-placed responders (including international and national NGOs and UN agencies) through transparent process (UNOCHA).

CERF receives the contributions year-round from the donors, which mainly consist of governments, foundations, charities, and individual donors, and then collected into a single global fund. In this case, the CERF will mostly get the yearly funding by the listed-donors. With the available money, the organizations would be able to jump-start the activities in a sudden-onset emergency, then scaled up and expanded the assistance when the situation suddenly deteriorates. The CERF has a $1 billion annual funding target, and it is a fully non-earmarked donation to meet the urgent, life-saving needs (UNOCHA).

After the funding is collected, the UNOCHA provides a portal to present the detail of donation's flow. The principal source of financial data of the publications is the OCHA’s Financial Tracking Services (fts.unocha.org). Other sources include: UNHCR (data.unhcr.org), the CERF data (unocha.org/cef), and the CBPF business intelligent portal (pfbi.unocha.org), in which all the figures are in US dollars (UNOCHA, 2020). With these tracking services, people can see detailed information about the flow of the funding. Here is the example of the tracking services interface from the pbfi.unocha.org website:
Figure 3.13 The interface of lists of the donors and the beneficiaries (pbfi.unocha.org)

The figure above describes the interface of the pbfi.unocha.org. In this first interface, we can get the general information the total contribution in a year (in US dollar), the number of the donors, and the number of beneficiaries. Below, listed another detailed feature, which listed the country of the donors, the amount they are donated, the listed country of recipients, and the amount of money each beneficiary received.

We can get more detailed information: the money received by each beneficiary, the list of the donors, and the locations received their donations. All this information is available by clicking to one of the countries (either the donor or the beneficiaries). Also, the tracking website provides more advance feature by giving the allocations overview.
The allocations overview provides the map of the funding distribution. The menu inside this interface would specify more about the flow. To get more detailed listed, the available information also able to be downloaded in the form of excel and images. The website also listed the information presented by clicking on the menu and drilled down to the menu tab. Besides, we can also select one of the menu so that we can analyze based on its period/cluster/partner type, etc.

<table>
<thead>
<tr>
<th>Scope</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donors</td>
<td>The list of the country who donate</td>
</tr>
<tr>
<td></td>
<td>The amount of each country’s donation</td>
</tr>
<tr>
<td>Time</td>
<td>Year of the donations</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>The list country of the beneficiaries</td>
</tr>
<tr>
<td></td>
<td>The amount of targeted people</td>
</tr>
<tr>
<td></td>
<td>The amount which received by each beneficiaries</td>
</tr>
<tr>
<td></td>
<td>The total amount of the fund allocated</td>
</tr>
<tr>
<td></td>
<td>The allocation type (name of the country and period of allocation)</td>
</tr>
<tr>
<td>Project</td>
<td>The name of the project</td>
</tr>
<tr>
<td></td>
<td>The number of the project</td>
</tr>
</tbody>
</table>
The concern/cluster/field of the project (e.g. logistics, foods, shelter, educations, early recovery, nutrition, protection, health, etc)

<table>
<thead>
<tr>
<th>Partners</th>
<th>The number of the partners</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Partner types (e.g. international NGO, national NGO, UN agencies, etc)</td>
</tr>
</tbody>
</table>

Even to the country of beneficiaries, people will be able to access the number of recipients by gender (man/woman). By providing an advance technology of the tracking services, UNOCHA applied the transparent flow of the funding both to the donors and the beneficiaries. By clicking the blue dots, we can get more information about the specific area. For example, the amount of money allocated, the number of targeted people, number of partners contributed, number of the project, etc. The figure below shows the interface when we drill down the blue dots.

Figure 3.15 The interface of the detailed program (source: pbfi.unocha.org)

As we have mentioned before, that one of the donor’s concerns when contributing their donations is the visibility. The UNOCHA is providing the humanitarian responses around the globe. The institution is enabling an IT tool to present the transparency. Reaching this step, we
will be gathered with advance information about the flow of the funding received and as the user of the tracking and tracing tools provided by the UNOCHA.

**The crowdfunding initiatives**

Crowdfunding is a distributed small-scale fundraising, often facilitated by technology, in which the donors could send the money directly to the disaster area. The crowdfunding system is used for humanitarian response and for entrepreneurship purposes. Both of organizations or individuals can leverage on the crowdfunding system. Salazar, et al. (2015) on the paper titled “Crowdfunding for Emergencies” published by UNOCHA, there are 4 types of crowdfunding models:

1. Donation-based crowdfunding: most straightforward and traditional crowdfunding, in which the money is provided to an organization by the donors with no further expectation on the receiving agency
2. Reward-based crowdfunding: when donors receive a “thank-you” reward in exchange for support
3. Debt-based crowdfunding: when crowd lends money to the project initiator and expect repayment over time with some fixed rate of interest
4. Equity-based crowdfunding: when the crowds participate for micro-investment

Among those four models, the type no 1 and 2 are frequently used for humanitarian response. Nonetheless, the debt-based crowdfunding and equity-based crowdfunding might be helpful during the recovery and reconstruction phase. Traditional crowdfunding may aim only for a single objective (single-goal framework). Another two initiatives available are multi-stage goals framework and distributed-goals framework. The multi-stage goals framework is allowing the fundraiser to specify several financial goals along their respective activities. This framework helps donors to understand how a specific level of funding would affect a response. The distributed-goals framework allows the organization to raise awareness of critical yet underfunded project. To better visualize the framework, here are the example of the framework.
The funding framework helps the donors to understand the distribution of the funding for a given project. The crowdfunding platforms usually aim to the individual as compared to the agencies. They can be used to support local and international fundraising (e.g., Indiegogo during the response of Nepal’s earthquake in 2015). Crowdfunding usually held in a platform, and “trust” will be one of the concerns of the stakeholders. The accreditation agency (e.g., Crowdfunding Accreditation for Platform Standards – CAPS) could be the option to accomplish the “standard” or “certification” to achieve the “badge” of trustworthiness. As mentioned before, by increasing transparency, accountability, and reporting, will be increasing the trust and ensures the donor engagement. As mentioned earlier, the activity of certification and updating (transparency) will increase the donation per month. In this way, a crowdfunding platform will be able to reach the crowd.
The military services in humanitarian actions

The military services also aimed to help the humanitarian operations, especially in last-mile delivery. Start with the concern that the capacity of civilian agency may be extended and infrastructure damaged, the domestic and foreign militaries are expected to play a significant role in responding the humanitarian needs (Poole, 2013). Several regulations and guidelines were published by the UN to manage the law of the military services and humanitarian aid. “The Oslo Guidelines” was launched in 1994 by UNOCHA with the aim of the present guideline on the Use of Military and Civil Defense Assets (MCDA) in disaster relief. This guideline used to establish the basic framework for formalizing the effective and efficient use of foreign military and civil defense assets in international disaster relief operations. The MCDA works under the UN control to support the humanitarian activities (UNOCHA, 2007)

The “Civil-Military Guidelines and References for Complex Emergencies, 2008” was published by UNOCHA and IASC (Inter-Agency Standing Committee), the inter-agency forum of UN and non-UN humanitarian partners. The “complex emergencies” defined as the condition humanitarian crisis in a country, region, or society where the total or considerable breakdown of authority resulting from internal or external conflict and requires an international response that goes beyond the mandate or capacity of any single agency and/or the ongoing UN program. In this guideline, the description of civil-military relationship, in complex emergencies, the guidance on the use of military and civil defense assets to support the UN’s humanitarian activities, and the use of military or armies escorts for humanitarian convoys (UN-IASC, 2008)

In regards of the funding and costing of the MCDA, the MCDA assistance should be provided at no cost to the affected states, unless otherwise agreed between the concerned states or regulated by international agreements (UNOCHA, 2007). In several countries, cost-sharing mechanisms have been developed across defense and aid budgets. For example, The Australian Department of Defense (DoD) will bear the cost if it is less than AUS $10 million. In Belgium, Japan, the Netherlands, Sweden, Switzerland, and the United Kingdom (UK), the defense militaries are partly reimbursed from the humanitarian budget for certain expenses (Poole, 2013).

Moreover, because the military assets are kept in a state of readiness, procurement, maintenance, training, and other investment costs, are already budgeted. Therefore, it is typically not considered in assessing the costs of deployment for humanitarian activities. If these investment costs were considered, the real cost of military assistance would be immense. Therefore, military assistance is often in effect subsidized by existing state investment in military capabilities, in
comparison with market rates one might face when trying to procure similar assets and services via the private sector. There is no universal standard to report when counting and estimating the financial value of military contributions; the interpretation of the costs will be varied. Many donations are in-kind. Therefore it would be difficult to ascribe in monetary value. Or they might be written-off against military budget and not be included in assessments of additional costs (Poole, 2013).
CHAPTER 5

Discussion

The supply chain finance and humanitarian aid are two different areas with their characteristics and features. This thesis elaborates and explains how the supply chain and finance have a connection to the humanitarian aid. In this chapter, the discussion will be developed regarding all the information in the previous chapters to answer the research questions presented in chapter 2: *what are the connection and role of supply chain finance in humanitarian aid?*

The nine themes are encompassing the connection of the two areas: in-kind/cash donations, temporal (pre-disaster/during disaster/ post-disaster), digital/information technology, corruption, logistics (inventories, storage, physical distribution), financial tracking and tracing, procurement, supply chain finance, and forecasting. We will discuss the research question and dividing this chapter into two major sections to explain the connection and role of the supply chain in humanitarian aid.

**The pillars of supply chain finance and humanitarian aid supply chain**

In this section, we will present the pillars which will connect the two different areas (the supply chain finance and humanitarian aid supply chain). Concerning the peculiarities and concerns of each theme, we will able to generate the concept by combining the findings in the previous chapter. The baseline will be the SCF, and the pillars will consist of 3 critical elements of the SCF. These three elements will involve the nine themes. As a preliminary, we will discuss our findings, from the general background, obstacles, and the three aspects of SCF.

The main actors in humanitarian supply chain aid pictured as follows:

![Figure 4.1 Main actors of humanitarian supply chain aid (re-adapted from Thomas and Kopczak, 2005)](image)

There are other supporting actors to support those three actors, for example, the logistics officers, the procurement team, the data analysts, the medical teams, volunteers on fields, and other actors (e.g., local government, media). Supply chain finance is closely related to the financial flow management for the inter-organizational level, which means it would require the teamwork from those three main actors. The benefit of the supply chain finance’s application would depend on
the actors along the chain. Similar to the commercial supply chain, actors along the chain will support the activities from upstream to the downstream.

Humanitarian aid faces three obstacles. First, the humanitarian aid response may face two kinds of situations; to keep the relief items ready to be mobilized before it is needed (but currently, the humanitarian agencies are having a challenge providing the cash to operate the activities), and; when the humanitarian agencies have no items but the disaster occurs, and the agencies need to respond as soon as possible even before the cash is available.

Second, generally, the HASCF needs the support from several fields. The humanitarian response indicates the funding gap issue as one of the challenges. Based on the ECOSOC (Economic and Social Council of UN) - Humanitarian Affairs Segment meeting in Geneva in June 2019. This gap is caused by structural poverty, climate change, and population growth that are leaving an increasing number of people vulnerable to the devastating impact of conflicts and natural disasters. Despite the committed donors, needs are insufficiently and unevenly met, thus resulting in a gap between needs and response. These crises are characterized by the combination of low media coverage, lack of funding and weak political commitment, and resulting in an insufficient presence of humanitarian actors on the ground and resources to support the affected populations (ECOSOC HAS, 2019).

Third, the risk of corruption and misuse of funds exist when discussing about the funding. Many actors involving in humanitarian aid, the different types of donations, lack of facility to support the transparency activities, possibly cause the risk of corruption.

Therefore, in this chapter, the role of SCF for the whole humanitarian aid supply chain and how the issues need to be managed are discussed. The supply chain finance has three critical elements (based on the objective described by Gelsomino et al. 2016) to be considered:

1. the liquidity/cash
2. the operational activities
3. the engagement of the actors

These elements are indeed relevant to humanitarian supply chain operations across the nine themes previously identified. For example, lack of liquidity/cash can impact in all sector of the chain, for the operational activities might have the possibility not to meet the demand of the beneficiaries and operational costs such as logistics costs, transportation costs, warehousing costs, and critically, procurement costs which mentioned accounts for 65% of total expenditure.
(Blecken and Hellingrath, 2008). Even during the reconstruction stage, when usually beneficiaries will receive the cash to rebuild their area as well as development programs. Another example of how they are interrelated to each other is when it’s detected we have a lack of liquidity/cash. The IT (in this case: media) can raise the awareness to the donors (Piotrowicz, 2018), or providing the solution through crowdfunding initiatives (Salazar, 2015).

The SCF will be as the baseline, and the nine themes will be defined and classified according to the three key elements of SCF. The operational activities will include logistics, procurement, and forecasting since they have a strong correlation with operative work. The engagement among the actor will embrace corruption, financial tracking and tracing, and information/digital technology. The liquidity/cash will incorporate the donation (cash/in-kind donation) and the timing (pre-disaster/during disaster/post-disaster).

Operational activities: logistics, procurement, and forecasting in HASCF

The operational activities encompass three themes: logistics, procurement, and forecasting. The operational activities have a direct role directly for all the actors. The operational activities also vary based on their timing (pre-disaster/during the disaster/post-disaster), in which each of the stages need a different focus. The relief items need to be effectively available and delivered to the beneficiaries. But, in the case of humanitarian aid, it is not possible to predict the demand of the items as in the commercial supply chain. The unpredictability and uncertainty of humanitarian assistance, drives the supply chain of this field to be agile, in which Oloruntoba
and Gray (2006) defined as the ability to thrive and prosper in an environment of constant and unpredictable change.

Logistics overall includes three aspects: inventories, physical distribution, and storage. Generally, in managing the logistics, humanitarian organizations need strategies to keep the whole chain effective and efficient. It is essential to minimize the unsolicited donations that might cause the ‘second disaster’ and manage the ‘important relief aid’ to be available as the first strike of the disaster. The initiative taken by IFRC is by collaborating with global suppliers in procuring the essential relief items (e.g., blanket, sleeping bag, etc.), in which, as a consequence, will be resulting in the commitment to keep a pre-determined stock. Dignan (2005, cited by Kovacs and Spens, 2007) also added that the same regulation also applied by UNICEF, in which this NGO has a distribution center with the most commonly needed items in Copenhagen. The same initiatives, as already explained before, also done by many agencies relief in making pre-purchasing agreements with suppliers of drugs, tents, or blankets.

Concerning the inventories (as a part of logistics), according to Oloruntoba and Gray (2006), the humanitarian supply chain is unpredictable, uncertain, and needs flexibility. They proposed the need for strategic inventory maintained in a generic form close to the downstream and the demand information close to the upstream. These two can produce a hybrid supply chain that combines lean and efficient supply upstream and agile and effective supply downstream. They explained the strategy of postponement, which intended to reduce the “anticipatory risk” of logistics and postponing the inventory until the customer order received. This proved a cost-effective substitute for pre-positioning and enabling the rapid and appropriate relief supplies. The “strategic inventory” then distributed according to the needs of end-users. This statement related to the theory of SCF in which they can leverage on inventory to embraces the working capital from the perspective of “supply chain-oriented” to focus on the optimization of financial flow in the supply chain. This is also supported by the research conducted by Falasca and Zobel (2011), where the author explained the mathematical model that could help the humanitarian response to reduce the inventory costs, improved flexibility, and reduce response time. Also, the generic inventories would also support the act of preventing the corruption in which Oloruntoba and Gray (2006) mentioned the advantages of maintaining the generic inventory might help overcome the security risk, including the risk of diversion away from the aid recipients or potential of violence.
When discussing procurement, having more accurate data of items needed, the act of procurement can result in a better performance. Ordering the required items will reduce the unsolicited items, saving more expenditure, improving accuracy, and prevent the risk of corruption. In considering the procurement activity, to manage the availability of the relief items, the humanitarian agencies need to set up strategies to cope up with the agility of the disaster management. Managing the long-term agreement with the supplier is also one of the strategies applied in humanitarian organizations. The IFRC (as explained by Gatignon et al. 2010), as one of the big agencies responsible for the humanitarian response, manages the procurement activities by having an agreement with global suppliers to keep the first aid relief items available. IFRC joined an agreement with the global suppliers to continually provide the essential relief items such as blankets, sleeping bags, and tents. IFRC, during the case of Yogyakarta’s earthquake 2006, signed pricing agreements.

The forecasting would be needed both for technical (e.g., early warning system) and strategic (e.g., preparedness for item shortage) to manage the preparedness actions. The commercial supply chain theory emphasizes that the level of accuracy close to the customer is higher than the upstream level. The same result also applies to the humanitarian supply chain as the result of the Davis et al. (2016) also states the same idea. Davis et al. (2016) considered some initiatives regarding the supply chain, such as: mitigate the item shortage, enhance storage utilization, purchasing decisions, and improve downstream distribution decisions.

**Engagement among the actors: corruption, financial tracking and tracing, and information/digital technology in HASCF**

Engagement among the actors is a crucial keyword to manage the whole supply chain. When connected to the SCF and humanitarian aid, this element consists of: corruption, financial tracking and tracing, and the role of information/digital technology. The corruption act might be reduced by the effort of tracking and tracing in the system, as well as increasing the trust of the donors and increase visibility. As an implication, to facilitate the tracking and tracing system, the information and digital technology will be the tool to support this initiative.

As mentioned before, the corruption listed as one of the challenges in humanitarian response. Schultz and Soreide (2008) proposed four initiatives to prevent any corruption act:

1. Reducing the “on-the-spot” procurement: the idea of having pre-determined stock and inventory for most-needed relief items that mentioned before
2. Involving the beneficiary regarding the procurement activities: beneficiaries as the person who is living in the affected area and will continue the development of the in it are the ones who understand what they need to develop long-term community.

3. Monitoring and evaluation by “real-time evaluation”. UNOCHA has done this initiative in leveraging technology to maintain the financial tracking and tracing services as the activities to reduce the corruption. The ideas for proposing blockchain also emerge in cope up with fraud and corruption.

4. Sanctions: the firms might lose their eligibility to participate in future tenders for defined a period if they do any bribery.

UNOCHA, as one of the main humanitarian actors in the UN entities, already have a platform regarding the financial tracking and tracing. When the donors intended to donate through the UNOCHA, the donors need to meet the requirement and regulations provided by the UNOCHA (UNOCHA, 2010) and report their donation through the FTS portal to maintain the tracking and tracing. UNOCHA leverages the digital technology to display funding flow with its details (the donors, the programs, the period, the beneficiaries, etc.). This activity will increase the visibility of the actors among the humanitarian supply chain response. The technology that enabled by the advance information that connects the actors thus will create innovative solutions. Not only UNOCHA that leverages the technology, but several platforms also take advantage of information and technology to enhance the visibility (e.g., the Aidmatrix Network in 2007 as a central portal donation management where NGOs and donors to post and respond to the beneficiaries).

The other initiatives in leveraging the technology (especially for collaboration with other parties) are the mobile money services, voucher-based initiatives, and the idea of leveraging on the blockchain. The advance technology also facilitates the beneficiaries during the post-disaster to better manage the cash donation meets with the community’s needs; for example, the mobile-money services as already established in African countries since 2007 (Monks, 2017) and the voucher-based initiative (Heaslip et al. 2018). Meanwhile, the blockchain initiative emerges since this platform is highly associated with visibility, but this initiative still needs a further research to be widely implemented. As mentioned before, the research done by Ko and Verity (2016) which discussed the benefit of blockchain that enhanced the community’s involvement to rebuild their areas and their capabilities, also as the effort in bringing down the misuse of funds.
Apart from the external efforts, the technology also can be used inside the systems (internal purposes). For example, during the operational activities, the technology is used for forecasting, procuring the resources, managing the funding to be available, and logistics operations. The advance technology is leveraged both in strategy management and decision-making. Planning and execution in each stage of humanitarian relief can be performed to serve beneficiaries with the support of advanced technology.

Caniato et al. (2016) identified “level of digitalization” as one of the most relevant enablers for the implementation of different clusters of SCF solutions. Bals (2019) emphasized this statement and highlighted the importance of exchange information access across the stakeholder. Caniato et al. (2016) also stressed that the successful applications of an SCF model does not rely on financial variables only, but the characteristic of supply chain relationships (e.g., level of trade process digitalization or intra-firm and inter-firm collaboration). By exploiting the digital technology, the different actors along the supply chain of humanitarian response, can increase the visibility, as well as media to invite the collaboration from donors and local government, thus enabling the increase of the engagement between the agencies, donors, and beneficiaries.

By leveraging on the digital technology to support the financial tracking and tracing, the risk of corruption as the challenges faced by humanitarian organizations can be reduced as well as increasing the donor’s trust upon the activities carried along the humanitarian response.

**Liquidity/cash: donations (in-kind and cash donation) and timing (pre/during/post-disaster)**

The availability of the resources (liquidity/cash) is important during every stage of the humanitarian response (pre-disaster, during disaster, and post-disaster). The donors are the main stakeholders for the whole system. The funding gap listed as one of the challenges faced by the humanitarian supply chain. Crowdfunding and the Grand Bargain are the proposed initiatives to solve this issue. The World Humanitarian Summit in 2016 released the Grand Bargain. Grand Bargain aims to reduce the funding gaps by reduce earmarking, harmonize reporting requirements, and provide longer-term funding, more transparency and to define longer-term strategies and planning. Together, on the operational side, donors and implementing agencies aim at strengthening the role and engagement of local actors, being more accountable and strengthening the participation of affected populations and considering cash as the preferred aid modality wherever possible (grandbargain4ngos.org). Meanwhile, the crowdfunding invites worldwide participants to be the donors of an event and reach some amount of donations along with the information such as: timeline, financial goal, purposes, and the organizers. Mejia et al.
(2019) also emphasized the importance of certifications and updates for the crowdfunding platforms as the work-related of these elements can increase the amount of donations/month. Going back to the SCF, as mentioned in the first chapter, one of the perspectives of SCF is the “supply chain-oriented,” and it is closely related to working capital. This capital is used to support the day-to-day business operation. In terms of the commercial supply chain, the company usually preferred the capital in cash. Frequently, there is a gap between the time when the customers pay for the product and the time when companies pay to the supplier, which will risk the companies in having no liquid cash to operate their daily activities, in another term, cash-to-cash cycle. For the case of the commercial supply chain, this would be solved by three ways: shortening the payment time for the customers, extending the payment time for the companies to the suppliers, and the “just-in-time” in which the companies only put a stock for the needed items.

It is essential to match the donation with the different stages (timing) in humanitarian response. One of the methods performed by the humanitarian aid response in maintaining the working capital, is by keeping the urgent items for the first aid response after the disaster. The in-kind donations, non-perishable items (e.g., blanket, sleeping bag, tents, etc.) were concluded as the items to support the first stage of relief activities after the disaster strike. Thus, in leveraging the in-kind donation to arrive at the disaster site immediately, the humanitarian actors try to procure these donations in several ways. The Super-storm Sandy, when Amazon was engaged as the e-commerce partner to provide the first aid response to the beneficiaries, and will eliminate the unsolicited donation, improving the effectiveness by only focus on delivering the first aid relief needed items.

In regards of “supply chain-oriented” perspective, which leveraging the availability of working capital, the initiative of the cash-based response (CBR) for humanitarian aid, Heaslip et al. (2018) in their research, argued that the CBR could speed up the delivery of aid, reduce the need of inventories and transportation capacities. Consequently, with having the cash on hand, it will be more flexible in managing the current demand of beneficiaries.

In managing the cash donation and avoiding the unsolicited cash donation, the UNOCHA, as the UN’s representative responsible for humanitarian aid, released a regulation regarding the humanitarian giving in 2010. This guide aims to reflect the priority needs throughout an emergency response. The cash donation, as mentioned before, can be donated through the CERF and CBPF, and it would be count as the non-earmarked donation. The earmarked donation can
also be facilitated but only at the specific project/relief in humanitarian consolidated/flash appeals. In line with the cash donation, the regulation for the in-kind donation also managed to reduce the unsolicited donation. The in-kind donations need to be corresponding with the priorities for life-saving supplies set by the government of the affected country and humanitarian community, and to be appropriate for the beneficiaries. In accordance to respect the law, the in-kind donation needs to be accompanied by the documents and planned with the national authorities and humanitarian community to avoid any material convergence (UNOCHA, 2010).

The availability of donation (cash/in-kind) according to the timing (pre-disaster/during disaster/post-disaster) is essential. Several regulations, initiatives, and strategies have been made to support the resource’s availability in response to the agile humanitarian aid environment.

The role and connection of supply chain finance in humanitarian aid

The previous section discussed the connection between the supply chain finance and humanitarian aid supply chain. We can conclude that the humanitarian aid and supply chain finance have a secure connection showed by the pillars that matched with the nine themes from the academic articles related to humanitarian aid. It is also crucial to maintain the availability of the resources (cash/in-kind donations) to meet with the beneficiaries’ needs during all the stages of humanitarian responses. When facing the disaster relief, suggested strategies can be taken, by combining the perspective of supply chain finance in humanitarian aid.

The events and the actors are another two elements that are determining the HASCF. Generally, each element needs to work together and support each other to perform the HASCF. The sequence line below is picturing the relationship among these elements.

![Figure 4. 3 The sequence line of HASCF](image)

Events are the first sequence close to the practice of HASCF, followed by the actors are the second sequence, which will both fulfilling the practice of HASCF and act during the events. In implementing the HASCF, it will require the events and the actors, as the first two essential elements. Each element represents the events and how they are performing. When the events occur, the actors play their roles. The beneficiaries will ask the basic needs items, the humanitarian organizations will manage to deliver the relief items, and the donors will give their
funding to the humanitarian organizations. Then it continued with the other elements along the line.

The liquidity/cash will support the actors as well as manage to overcome the events according to its stage. The operational activities run to deliver and manage the donations (which included in the liquidity/cash) given by the donors and to be received by the beneficiaries through the humanitarian organizations. To be well-collaborated, the engagement among the actors is essential also to cope up with the challenges and to better perform the HASCF.

The liquidity/cash (which includes donation/funding and timing) is having a strong correlation in the concern of keeping the “operational activities running” inside the chain. Supply chain finance concerns are managing the cash in the systems to maintain the operational activities, which is strongly related to how the role of donation and funding will significantly influence the performance of the whole chain.

The humanitarian agencies also need the inventory (as part of operational activities) to reach and fulfill the need of the beneficiaries, possibly in every stage during the disaster (pre-disaster/initial stage and post-disaster/development activities). As an implication, this will also affect the type of donation (cash donation/in-kind donation), as well as the procurement activities, and how the humanitarian agencies can acquire the aid as effectively as possible. This shows how the operational activities will collaborate with other elements, with the consideration of the availability of the resources and its timing.

The engagement among the actors also embraces the liquidity/cash and the operational activities. For example, as mentioned before, the technology is needed, both for the internal systems and external relations (engagements). By exploiting the technology, it is possible to minimize the risk of corruption since it facilitates the opportunity to have accountability and visibility of the activities. The digital technology applied to all stages of humanitarian relief. The donors and the agencies would ask for transparency in the relief activities. Furthermore, nowadays, the role of digital technology involves almost in all components of HASCF, including both the elements of operational activities and liquidity/cash. Each of the constituents (e.g., procurement, donations, logistics, financial tracking and tracing, corruption prevention) leverages the digital technology to make the efficient process, saving more resources, increase the visibility, and enhance the collaboration between the actors (donors, agencies, and beneficiaries).
The funding and the donors are two correlated essential elements in humanitarian aid. Without these elements, the whole system of humanitarian assistance would hardly perform well. But the donors need the transparency and visibility regarding how the humanitarian agency will manage their money. Generally, the whole chain needs financial tracking and tracing. Information and technology show their role of monitoring the liquidity/cash. In cope up with the issue of funding gap (the differences between the availability and the targeted amount), an initiative named The Green Bargain was launched as a strategy to manage the funding gaps and maintain transparency and accountability.

The actors and events are the two parts close to the performance of the HASCF practices. These whole elements in the sequence line work together to perform the HASCF.
CHAPTER 6

Conclusion

This thesis is aiming at investigating the supply chain finance’s role in humanitarian aid practices. This thesis provides an insight into how the supply chain finance plays a role in humanitarian aid and supporting the relief coordination. This thesis can be useful for the reader that has a little knowledge about this field as well as humanitarian experts who are willing to improve better the organizations, practically in facing the challenges and agile environment. This thesis performs a literature review that briefly elaborates through the practices, theory, suggestions, and the development research of supply chain finance and humanitarian aid.

The humanitarian aid itself has a strong connection with the supply chain since this field needs the coordination and collaboration from stakeholders and facing the challenges in managing the resources in different steps of humanitarian aid relief and the agile environment. The HASCF (humanitarian aid supply chain finance) is quite a new topic in which we have the little references related directly to this topic. A literature review was performed through numerous papers and references.

The main findings of this thesis are the intersection between the supply chain finance and humanitarian supply chain. The supply chain finance’s role in humanitarian aid aims to have a proper donation response (cash/in-kind donation) during every stage. As a result of this literature review, nine themes emerged and projected into three essential elements from the SCF and projected into the three pillars: the liquidity/cash, the operational activities, and the engagement among the actors. The “liquidity/cash” includes the donation and timing. The “operational activities” consists of the logistics, procurement, and forecasting. The “engagement of the actors” consists of the digital/information technology, corruption, and financial tracking and tracing. These three critical elements then connected with the nine themes and displayed in a sequence line with HASCF practices as the primary objective. The goal is the HASCF practices, followed by other elements such as: events, actors, liquidity/cash, operational activities, engagement among the actors. The sequence line of HASCF represents the elements that will support the practices of HASCF.

This study has pointed out some consideration in practicing the HASCF. The significant contribution to implement this practice is the importance of visibility and accountability among the actors. The effort of transparency leads to the improvement of diminishing the corruption and
enhancing the collaboration among the stakeholders, as well as rectify the funding issue. They strive to make better visibility and accountability described through the effort in leveraging the technology, both in improving the internal system and external system of each party. Finally, the HASCF practice would possibly manage the available resources (material, funding, infrastructures, volunteers, etc.) to be well-distributed and well-performed in different stages of humanitarian aid relief (pre-disaster/during disaster/ post-disaster). This practice also proposed to avoid any waste, shortage, and adequately meet the current needs of the beneficiaries.

This study makes contributions for researchers, practitioners, and policymakers when intending to do the practices of HASCF and along with its concepts. This thesis presents the theory of HASCF through the proposal of the three pillars and sequence flow in humanitarian aid. The role of the nine themes developed based on literature review, and by focusing on these, the thesis provides insight into how these themes fit with the SCF and integrate with humanitarian aid and perform HASCF. The humanitarian assistance needs the collaborations from various stakeholders and supporting parties. The findings allow the humanitarian practices to cope up with the agile environment of humanitarian relief by controlling the available resources to deal with all stages of the humanitarian assistance as well as the comprehensive strategies in managing the collaborators during the aid.

The thesis has some limitations and leave room for further investigation. First, the literature review opens a comprehensive view of leveraging supply chain finance in humanitarian aid relief. The direct research regarding the field experience would exhibit more empirical results by collaborating humanitarian experts in maintaining the supply chain finance for humanitarian aid, since the selected literature mostly published by academia. By examining the references with the involvement of humanitarian organizations/NGO/government might resulting in a new perspective in comparing the theory and the practical experiences. Thus, it will open the opportunity in the future to assess the performance and efficiency of HASCF. Second, most of the selected literature was discussing general humanitarian aid relief with more tendency on disaster rather than the development aid. As a consequence, this thesis might not well-described the development aid conditions.
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