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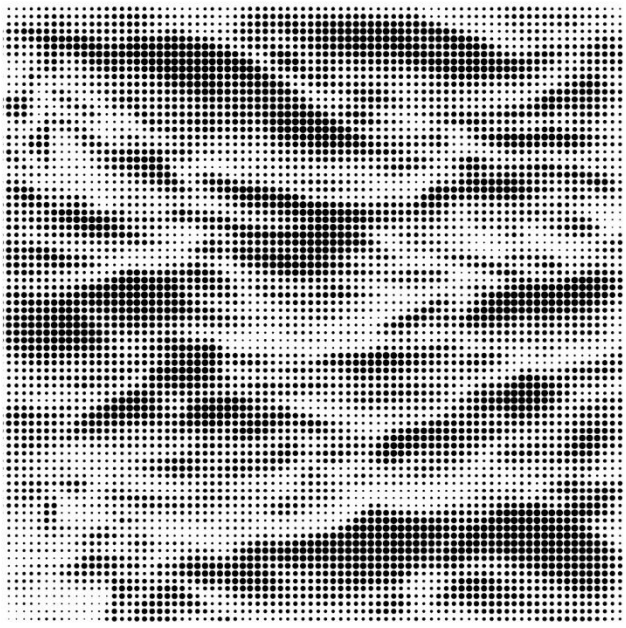
School of Industrial and Information Engineering
Master of Science in Management Engineering

UNFOLDING CROSS-SECTOR COLLABORATION ELEMENTS AND PATTERNS IN THE HUMANITARIAN SUPPLY CHAIN



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“Look up at the stars and not down at your feet.

Try to make sense of what you see,

and wonder about what makes the universe exist.

Be curious.”

Stephen Hawking

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Cecilia e Marina

Table of Contents

Table of Figures

Table of Tables

Acronyms and abbreviations

CBT= Cash Based Transfer

CCF = Collaboration Critical Factor

CCSF = Collaboration Critical Success Factor

CHV = Community Health Volunteer

CSR = Corporate Social Responsibility

DHMT = District Health Management Teams

ETS = Emergency Transport Scheme

GONGO = Governmental Non-Governmental Organizations

HA= Humanitarian Aid

HL = Humanitarian Logistics

HO= Humanitarian Organization

HSC= Humanitarian Supply Chain

IDPs= Internally Displaced People

IFRC = International Federation of Red Cross

INGO = International Non-Governmental Organizations

KPI = Key Performance Indicator

LNGO = Local Non-Governmental Organizations

LSPs = Logistic Service Provider

NEMA= Bahamian National Emergency Management Agency

NMEC= National Malaria Elimination Center

PS = Private Sector

SC= Supply Chain

SCM = Supply Chain Management

SLR = Systematic Literature Review

SME= Small and Medium Enterprise

SOP= Standard Operating Procedure

UN = United Nations

Abstract

The thesis explores the cross-sector collaboration among players based in different sectors (public, private, no-profit) in the Humanitarian Supply Chain (HSC); it identifies, describes and analyses the criticalities and the patterns among the elements of this emerging field through empirical examples and theoretical research.

According to the practitioners and the academic world improving cross-sector collaboration is key to integrate the efforts of many different players involved and to enhance the success of the disasters relief.

However, this is an emerging field which still needs to be explored.

To cope with this research gap, we will explore systematically the existing literature identifying the main elements of the cross-sector collaboration in HSC and building a whole picture of them.

These elements will be explored also in seven real case studies about humanitarian collaboration projects investigated through semi-structured interviews and the study of other primary and secondary sources.

Finally, a first analysis within each case will identify the case-specific critical elements, then we will reflect across the cases to identify the patterns of these elements. Specifically, we will provide innovative insights and suggestions about the central coordinator, the institutionalization, private sector and government involvement. These results can be valuable both for practitioners and academics.

Keywords: cross-sector collaboration, collaboration, partnership, cooperation, humanitarian supply chain, humanitarian logistics, disaster relief, government, private sector, institutionalization, central coordinator, critical factors

Sommario

La tesi esplora la collaborazione tra attori che lavorano in diversi settori (pubblico, privato e no-profit) nell'ambito della supply chain umanitaria. Essa identifica, descrive e analizza le criticità e i patterns degli elementi di questo settore emergente attraverso evidenze empiriche e ricerca teorica.

Sia il mondo dei professionisti che quello dei ricercatori accademici considerano la collaborazione tra diversi settori un elemento chiave per coniugare gli sforzi dei diversi attori coinvolti e per migliorare il successo nelle operazioni di soccorso nei disastri.

Questo settore, però, è emergente e deve ancora essere esplorato.

Per coprire questa lacuna della ricerca, esploreremo in modo sistematico la letteratura; così individueremo e creeremo una visione d'insieme dei principali elementi della collaborazione tra diversi settori nella supply chain umanitaria.

Inoltre, investigheremo questi elementi studiando anche sette casi di studio riguardanti progetti di collaborazione umanitaria tramite interviste semi-strutturate e lo studio di altre fonti primarie e secondarie.

Infine, verrà sviluppata una prima analisi per analizzare ogni singolo caso e identificarne gli elementi critici; successivamente individueremo i pattern tra questi elementi confrontando i diversi casi tra loro. Nello specifico, forniremo una visione innovativa e dei suggerimenti riguardanti il ruolo del coordinatore centrale, la formalizzazione, il settore privato, e il coinvolgimento del governo. I risultati ottenuti possono essere considerati di valore sia dai professionisti che dagli accademici.

Keywords: Collaborazione tra diversi settori, collaborazione, partnership, cooperazione, supply chain umanitaria, governo, settore privato, formalizzazione, coordinatore centrale, fattori critici,

Executive summary

1. Introduction

The 2020's world is dramatically witnessing the evidence of the need to increase the efficiency and effectiveness of the disaster relief operations due to the sudden spreading of Corona virus all around the globe.

However, past researches have highlighted that enhancing disaster relief implies to improve supply chain operations because 80% of disaster relief costs is due to logistics (Van Wassenhove, 2006).

For this reason this research investigates the study of humanitarian supply chain; in particular, it focuses on the cross-sector collaboration in the humanitarian supply chain that is *" the set of activities that involve collaboration between organisations that are based in three sectors: the state (government), the market (business) and civil society (such as NGOs or non-profits)"* . According both to practitioners and researchers, collaboration is a key factor because it allows to combine and exploit efforts of many and different players who participate the humanitarian aid.

Since the literature in this field is not mature, the research is explorative, and it aims to answer three research questions:

RQ1: "Which are the main elements of cross-sector collaboration in HSC?"

RQ2: "Which elements, among the cross-sector collaboration ones, can be considered collaboration critical factors (CCF)?"

RQ3"Among the collaboration elements, which are the more recurrent and relevant patterns?"

The contribution of this thesis is grounded on a strong theoretical base. Two main phases of study have contributed to build this solid base: a narrative review about HSC in general (HSC: Background and challenges) and a systematic literature review about the cross-sector collaboration in HSC (Systematic literature review on collaboration practices in the HSC).

Later empirical data will be collected in seven original case studies (5. Case studies) and two types of analysis performed.

2. Background and challenges in HSC

It appears fundamental to review the most relevant papers in Humanitarian Supply Chain (HSC) to familiarize and deeply investigate this sector because it is a peculiar field characterized by singular features: they are briefly reported in the next section. This preliminary phase allows us to discover the field of research and identify the most suitable research tools. In the section below are reported the main findings of this first phase of research.

Definition

Firstly, the HSC is defined: it is *"The system that is responsible for designing, deploying and managing the processes necessary for dealing with not only current but also future*

humanitarian/disaster events and for managing the coordination and interaction of its processes with those of supply chains that may be competitive/complementary." (Day et al., 2012)

Actors

Secondly, it is described the multiplicity and variety of actors who are involved in HSC: firstly, Humanitarian organizations (HO) are the primary actors, they assess the demand and they try to reach the final beneficiaries through different channels (Kovács & Spens, 2007); usually they are non-governmental organizations (NGOs). Secondly the militaries, whose involvement is challenging, because they are very different from Hos, but it also useful because they frequently provide adequate equipment, financial resources and trained workforce. Then the local government who is expected to be the main responsible of the country and the international government which are used to provide help in the affected areas. In addition, the private sector involvement is increasingly growing even if their mission is to make profit and not to respond the needs of beneficiaries ; the media who awakes the interest of public and institutions about the disaster and the needs; the donors who fund the operations and finally the local community which is usually the main beneficiary of the relief or humanitarian aid. In conclusion, these actors are very different from each other in terms of strategic compatibility, operational compatibility, interorganizational competition, partner's power disparity, and coordination process.

Disaster Phases

Thirdly, the phases of the disaster are identified studying also their impact on the HSC: the preparation before the disaster strikes can lead to a better response but it is often neglected because it implies capital to be invested that is not present before the disaster strikes. The HSC implemented should be lean. Secondly, the response is composed by an immediate response in which speed and effectiveness are critical to determine the failure or success, and a restore phase which aims to restore the basic services as fast as possible. In the response phase in the HSC should be agile. Finally in the recovery phase the aim is to restore conditions till an acceptable state, however this stage is often neglected or considered a secondary issue as the funds are mainly addressed to short-term activities. Also in this case the HSC should have an agile configuration.

General characteristics

It is possible to identify other peculiar factors of HSC. The first is uncertainty due to the unpredictable and dynamic nature of the disaster itself.
Secondly HSC is challenged by convergence: a sudden increment in the supplier and service provider base, material convergence for unsolicited donations which overwhelms the current supply chain and in terms of human capital.

3. Research design

Firstly, the research approach is identified.

This is an **explorative research**, it uses **an inductive approach** because it seems more valuable to explore all the relations, meanings and connections and build new theories in a peculiar and unique environment as HSC is. Therefore, a **multiple case-study strategy** seems particularly suitable to generate insights from the study of a phenomenon in its real-life context.

The choice of the approach determines the research method: just the collection of **qualitative data** enables to capture the relations and the insights of the collaboration topic and to describe it in a realistic way.

Different research methodologies are combined to reach the final results: a **systematic critical review of the literature** about cross-sector collaboration in the HSC to create a theoretical base. (Systematic literature review on collaboration practices in the HSC chapter). Successively, seven **case studies** are built collecting primary and secondary sources. In particular, **semi-structured interviews** enable to collect reliable qualitative primary data combining the need of investigating the causal relation among the elements and preserving a sort of standardize structure among the cases.

The following Figure 3.1 shows briefly the steps of the process followed for the entire research. For each step an explanation or comment is available in the 3.3 Research methodology chapter.

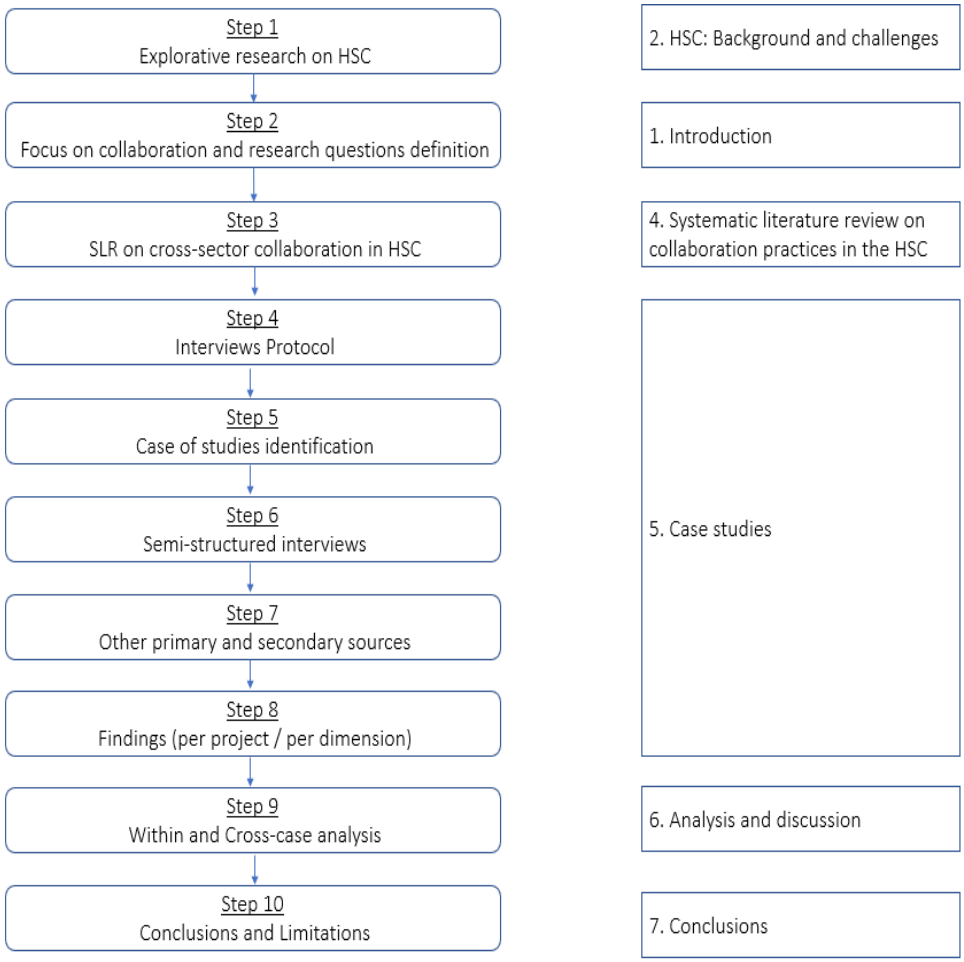

Figure 0.1: Steps of the research methodology

4. Systematic literature review on collaboration practices in the HSC

The SLR process aims to answer to the first research question [RQ1]: *"Which are the main elements of cross-sector collaboration in HSC?"*

Literature search methodology

The new paradigm of Durach et al., (2017) provides the guidelines to perform the systematic literature review. These guidelines consist in six steps briefly described:

1) The studies about HSC (HSC: Background and challenges chapter) and SC allow the definition of a *SLR framework* to study the cross-sector collaboration in HSC. This framework consists of 6 dimensions to describe the disaster features and 18 dimensions to describe the collaboration.

2), 3), 4) Successively, a synthesis sample of 40 primary studies is selected applying precise inclusion and exclusion criteria drafted to identify the most valuable and relevant ones. In particular, the two main criteria applied are the selection of the papers published just on selected journals and with a precise focus on the cross-sector collaboration in HSC and disaster relief contexts.

5)The relevant literature is studied and coded according to the framework defined in the step 1) in order to extract pertinent information.

6)The whole picture which emerges from the *SLR framework* is reported in the descriptive findings with a detailed description for each dimension about the knowledge, insights, and finally in the discussion the gaps emerged from the analysis of the sample.

Definition of the SLR framework

The dimensions of the *SLR framework* which represent the lens to study the cross-sector collaboration phenomenon are the elements identify as relevant for the collaboration. They are briefly reported in Table 4.3: SLR framework dimensions definition.

DIMENSION NAME	DESCRIPTION
Disaster Dimensions	
Phase	disaster stage (preparedness, response, recovery) for collaboration establishment
Location	place where the disaster has occurred and its features
Time	when the disaster has occurred
Cause	man-made or natural disaster
Speed of occurrence	the disaster's rate (slow-onset or sudden onset)
Size	Small-scale or large-scale disaster
Collaboration Dimensions	
Actors	who is involved in the collaboration and their features (number, features, role)
Scope	towards the suppliers or the beneficiaries (downstream, upstream
Type	Horizontal, vertical or cross-functional collaboration
Motivation	strategic reasons behind the relationship (beginning and ending)
Time span	the lasting of the relationship
Selection criteria	how the actors choose their partners in the collaboration

Institutionalization	formalized, not formalized collaboration and which type of formalization
Activities	activities performed, how many they are, and which reciprocal actors' responsibilities
Resources shared	which resources are the partners sharing and how they allocate them
Information share	which data are the partners sharing
Coordination Mechanisms	which mechanisms to collaborate exist (organizational and decision-making structures, communication tools)
Level	how much strong is the collaboration: strategical or operational
Relationship dynamics	operative benefits and costs of each actors and the mutual differences (un/balanced)
Enablers	which elements enables the collaboration
Challenges	difficulties and obstacles face in the collaboration
Outcomes	overall outcomes of collaboration (qualitative and quantitative)
Performance measurement	how to measure the performances of the collaboration, common Key Performance Indicators (qualitative and quantitative)
Risks	which are the collaboration and supply chain risks, shared or individual, metrics

Table 0.1 SLR Framework dimensions' definitions

Descriptive findings

The chapter 4.4 4.4 Findings on literature review describes the findings about the cross-sector collaboration divided by dimension. Successively, the literature gaps are identified for each dimension and, if present, some critical directions that need to be further explored.

Here it is reported a descriptive synthesis of both the findings and the critical discussion, divided by dimension. The references to the authors are available in the relative chapter or in the Table 4.4:Synthesis collaboration dimension findings

Disaster dimensions

Phases: The literature identifies some preparedness collaborative practices such as simulation models, awareness campaigns, "*dormant*" SC, however; it is remarked the lack of preparedness strategies. This lack strongly affecting the response's success. While the response, is the most studied phase. Regarding the recovery phase, the collaboration is less studied, but it reveals the importance of two level of collaboration: within the entities engaged (often NGOs or governments) and between them and the local communities. From a reflection about the literature it emerges as gap the analysis about how to manage relations, agreements and other aspects across, and in function, of the phases.

Cause, time location, size, speed of occurrence:: humanitarian collaboration is more common in natural and sudden onset disasters such as earthquakes; furthermore, the literature includes mainly recent disasters; few information about the location is generally available and finally the size is not measured by standard metrics (a possible gap)but it is possible to conclude that the sample is composed mainly by large-scale disasters.

Collaboration dimensions

Actors: The main dyadic relations created in the humanitarian field are: HO-HO, HO-militaries, HO-governments, HO-private sector. However, most of the relations in the field involve multiple actors at the same time and so different types of these relations exist in just one collaboration. The diversity of the actors is a key element of cross-sector collaboration. The comprehension of the individual features can help to study how it is possible to combine and to better exploit the actors'

efforts. This is a lack in the literature which does not report the individual characteristics of the actors (such as the name, the sector, the size, the nationality or the role etc).

Type and Scope: The type (vertical and horizontal) and the scope (upstream and downstream) describe the structure of the supply chain considered. However, from literature rarely it is possible to retrieve information about them, in particular it seems that the scope dimension does not fit with this research for different reasons.

Motivation: The study of the literature allows to build a list of the main motivations which lead different actors to collaborate. The motivations are different depending on the actor mission: for-profit (e.g. start operations in the country or region, CSR, reconstruct local market) and no-profit (e.g. get access to resources and expertise, scale-up the response, increase efficiency and effectiveness). The academics seem agree about the main motivations. Nonetheless, few authors focus their attention on the motivations to end a collaboration.

Time span: The duration of the collaboration is a missing data in the majority of the case studies present inside the literature sample. Nonetheless it seems an important element because it could be useful to classify the relations, as evidenced in some cases.

Selection criteria: Few authors deal with the criteria used to select the most suitable partner; nonetheless when these criteria are provided they seem to be connected with three other dimensions: the motivation that lead the actors in the collaboration, the type of actor to be chosen and the disaster's phase.

Institutionalization: contrasting views emerge from the study of this dimension: some authors see the contracts as enablers of collaboration and some other as a barrier or a sign of a weak relation. So, this dimension is a key future research area that need to be investigated. In general, it could be interesting to collect additional information about the use of agreements in the HSC and the generalization about which type of agreement could be useful according to the actors involved, the level and the time horizon of the collaboration.

Activities: This dimension seems really important to understand the practical configuration of the collaboration. The main primary (e.g. transportation, inventory management and warehousing) and secondary activities (e.g. information technology, human-resources training, and other back-office activities to support logistics) are collected for the different cases; however rarely it is explicitly mentioned who is the actor responsible of each activity.

Resources shared: The lack of resources is one of the main reasons to collaborate, nonetheless, none of the authors concentrate the research on the management of the resources. However, many papers include spots to deduce which are the resources used during the collaboration (e.g. skills, expertise, funding, logistics frameworks, capacity, raw materials)

Information sharing: Even if many papers highlight the importance of information sharing, there are few data about which are the information shared and transferred among the actors (e.g. needs assessment, availability assessment, warehousing capacity).

Coordination mechanisms: The papers of the sample report many information about this dimension. There are different types of mechanisms to coordinate the different actors: some of them seem to be widely use in HSC context such as umbrella organization, chain coordinator, networks or clusters. The classification of Lu & Xu, (2015) about the organizational structures(Figure 0.2 Figure 0.3 Figure 0.4) it is used to describe and classify the mechanisms mentioned by the different scholars. This dimension includes also the descriptions of the SOPs present in the cases and of the communications tools used by the organizations to communicate and coordinate each other.

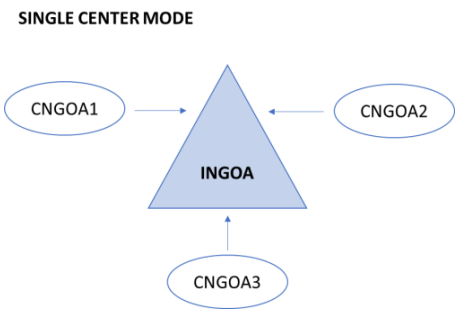

Figure 0.2:Single center mode classification by Lu & Xu, (2015).

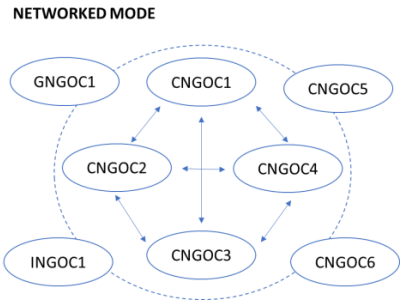

Figure 0.3: Networked supply chain mode classification by Lu & Xu, (2015).

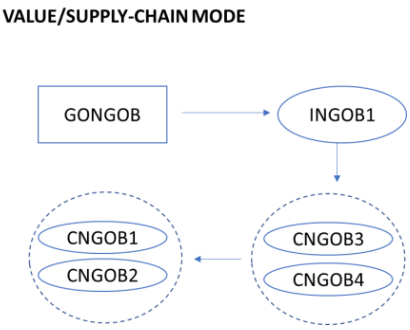

Figure 0.4: value/chain supply chain mode classification by Lu & Xu, (2015).

Level: Many authors refer to an operational, tactical or strategical level of the relation. Nonetheless, they provide different definitions of these terms so in the chapter 4.4 Findings on literature review a new definition of strategic and operational is identified *".* In the light of these new definitions the level is reported for the literature cases. This dimension is not always explicit, but it can be classified using the information from other variables. For this reason, the level appears as a possible ratio to classify the different types of collaboration considering many dimensions at the same time.

Relationships dynamics: None of the authors mention exactly the term relationship dynamics. However, it is possible to investigate this dimension combining the information provided about the balance of power of the relationship (balance or unbalanced) and the individual rewards, costs and risks of the relationship. Nonetheless few papers provide this information, so they are extracted also from papers in which they are not explicitly provided.

Challenges and enablers: The challenges and enablers are deeply studied in the literature review. Many of them are classified as both enabler (presence of the factor) and challenges (lack of the factor): for example, related to the different culture and priorities of the actors, presence of experience, competencies and SOPs, information management, trust, bureaucracy, etc.

Outcomes: Crossing the contents of the SLR it is possible to identify a list of the main collaboration outcomes. Some of them seem to be consolidated and commonly agreed by the authors (like cost reduction, better response time, effectiveness increment) and others are identified just by few authors. In this case it is needed to be tested if they are case-specific or general collaboration

outcomes. However, in the cases studies, the definition of the outcomes is not standardized within the sector and so it is difficult to compare them.

Performance measurement: From the literature it emerges that even if the collaboration combines the activities and the efforts of many actors, they never try to evaluate their joint efforts together. In general, just few authors describe systems and metrics implemented to evaluate the partnership success. Maybe there are not enough evidences collected from the field or the academics have not still focused their attention on this topic.

Risks: Very few evidences can be identified from the literature about the risks. In general, it could be interesting to collect additional information about the main risks that are present in getting involved in a collaboration (common and individual) and how to measure and mitigate them.

5. Case studies

As a main contribution of this thesis seven original case studies are collected and reported. They are the empirical information collected through six semi-structured interviews and integrated with other sources (primary and secondary) that will be the sample for the Analysis and discussion chapter. These case studies are about cross-sector collaboration projects in the humanitarian sector: they involve at least two sectors, among the private, no-profit or public sector. Each of them refers to a single unit of analysis of this research: the collaboration project itself.

Data collection

The first source of information for developing the case studies are 6 semi-structured interviews, however, other primary and secondary sources are integrated to develop a complete view of the case studies.

In the following table (Table 0.2) a brief summary about the information of the organisations interviewed is available: to facilitate the linkage with the findings they are divided by projects, by the seven case studies that will be reported in the findings. The Table 0.2 underlines each case study code, case study name, the organization interviewed (only in case A more than one organization has been interviewed about each case study), the respondent code and its role in the related organization and the secondary/primary sources.

Case code	Case study Name	Case study Location	Organisations interviewed	Respondent code – role	Other sources
A	Malaria treatment SC	Zambia	1.INGO 2.No-profit organisation	R1 – CEO of INGO R2 – PM of INGO R3 – CEO of No-profit	Actors websites; Project reports; Manuals; Newspapers articles
B	Emergency distribution SC	Madagascar	INGO	R1 – CEO R2 – PM	Actors websites; Project reports; Actors news

C	Food rations SC	Syria	UN agency	R1 – Logistic Assistance	Actors websites; Annual country reports; Project reports;
D	Cash based assistance SC	Syria	UN agency	R1 – Logistic Assistance	Actors websites; Annual country reports; Project reports; Papers
E	Survival kits pre-positioning	Kenya	Private company	R1 – Operation manager	Actors websites
F	Hurricane Dorian response SC	Bahamas	Private company	R1 – CEO	Actors websites; Actors news; Newspapers articles
G	Yemen medical distribution to IDPs	Yemen	INGO	R1 - Head of logistics	Actors websites; Newspapers articles

Table 0.2: Case studies - interviews details

The semi-structured interviews have been performed using a specific protocol inspired by the knowledge developed through the SLR and the gaps identified. After that the interviews are transcribed, analyzed and the data are reorganized in an Excel Sheet that represents the *findings framework* (see 5.2 Findings).

Findings content

As said the data collected are reported in a ***findings framework*** in order to permit a systematic collection of each case and later a cross-case analysis. The framework is derived from the *SLR framework* and the interview protocol: it has 17 collaborative dimensions that are the structure on which the findings of each case study are reported.

Case A: Malaria treatment supply chain

It is a project developed in Zambia (2017-2018) in order to provide access to treatment against malaria. The main partners involved in the collaboration are private companies, no profit organisations and the local Ministry of Health. The majority of them is collaborating through a consortium led by the central coordinator (a governmental body) that is characterized by an unusual balanced dynamic. It seems that these partners trust each other, and the decision making is quite shared thanks to the presence of steering groups. As said the government is present and it is actively involved: it is not only the key beneficiary, but it represents also the central coordinator and it has a direct link with the community through an adequate structure. In addition is key the usage of agreements: the relations are formalized, and they support the definition of roles and responsibilities, KPIs, resources and information shared and other aspects of the collaboration. Finally, the presence of previous relations among the partners has enhanced the collaboration while a main challenge is related to the donor restrictions that can influence the collaboration.

Case B: Emergency transport in Madagascar

It is a project developed in Madagascar (2011-2021) in order to provide innovative transport solutions for improving health services. The main partners involved in the collaboration are private companies, no profit organisations and the local Ministry of Health and the Ministry of Transport. The majority of these actors are selected by the central coordinator (a non-profit organisation) that has been contracted by the main donor: a big US organisation. This central coordinator has a strong decision making, it controls the information and resource sharing and it evaluates the partners' performance. As a result, the relationship dynamics seem unbalanced. Also, in this case it seems relevant that many elements of the collaboration are well defined in the agreement between the central coordinator and the other partners. The government here is not directly involved but the central coordinator keeps the relation with the Ministry. Finally, the usage of an appropriate cultural norms with the community has enhanced the collaboration while a main challenge is related to the size of the project that causes high inefficiency.

Case C: Food rations SC

It is a project developed in Syria (2011-ogoing) in order to distribute food rations to Internally Displaced People (IDPs). The main partners involved in the collaboration are LSPs (private sector), no profit organisations (LNGOs, UN) and the local Social Affair Ministry and education one (schools). The majority of these actors are selected and contracted yearly by the central coordinator (a big UN organisation) who has a strong power and creates unbalanced dynamics. It uses the partners to scale across the country: buying the logistic capacity from the LSPs and reaching more beneficiaries through the LNGOs or the schools who distribute the food rations. The government has a role in approving the import operations. What can enhance the collaboration is the fact that "each part needs other parties": it is not only convenient for the central coordinator but the LSPs have a working capacity not exploited and the LNGOs lack of funds. A huge challenge is the possible conflicts of interests due to the different actors' expectations.

Case D: Cashed based assistance SC

It is a project developed in Syria (2017-ogoing) in order to provide nutrition support for pregnant women through cash vouchers. The main partners involved in the collaboration are local supermarkets and plastic manufacturers (private sector), no profit organisations (LNGOs, UN) and the local Social Affair Ministry. The majority of these actors are selected and contracted by the central coordinator (a big UN organisation) who has a strong power and creates unbalanced dynamics. The central coordinator receives the necessary information about the women in order to supply the cash vouchers and distribute to the women through the LNGOs. Then the beneficiaries can purchase exactly what they need in the local supermarkets. The government has a role in approving the import operations. In this case the collaboration is enhanced by the fact that this model encourages the local economy; however, it is challenging because it is higher the risk of inflation.

Case E: Survival kits pre-positioning

It is a project developed in Kenya (2008-2010) in order to pre-position survival kits and encourage the local economy. The main partners involved in the collaboration are local manufacturers/suppliers and a traded logistic company (private sector), no profit organisations (one LNGO, two INGOs) and the local government. The majority of these actors are selected by the central coordinator (the LNGO) who has the final say in the decision making and owning the visibility on the SC information. However, the collaboration is based on the pooling of resources: warehouses and stocks pre-financed are shared among the NGOs. The private company is involved for CSR motivation and it shares its warehouse. In addition, the government facilitates the collaboration through tax exemptions. The agreements are used with all the partners: on the commercial aspects but also with the INGO but without scaring them formalizing the pooling of resources. Finally, the private sector is an enabler of the collaboration because it permits a higher expertise and a cost efficiency focus. A huge challenge is the resistance to change of the humanitarian sector: they are not used to the pooling of resources and the private sector involvement. This project has ended after 1 year and half.

Case F: Hurricane Dorian Response SC

It is the response to the hurricane Dorian in Bahamas (2019-ended). The disaster has been sudden and with a huge magnitude, for this reason many aspects organically evolved. The main partners involved in the collaboration are the local companies, no profit organisations (LNGO and INGOs) and the local government (governmental agency). The private sector is the initiator of the immediate response, providing resources and involving in the collaboration since the first day. Later the government and the other partners organically appear. After some week a central coordinator (governmental agency NEMA) emerged: it takes the decision, coordinates but permits also a sharing of information and resources among the partners. The government is involved actively through NEMA but it obstacles the INGO though bureaucracy practices. Finally, the strong community sense has enhanced the collaboration; while the logistic challenge and the lack of preparedness has challenged the project. Different recovery projects are emerged from this collaboration.

Case G: Yemen medical distribution to IDPs

It is a project developed in Yemen (2019-ongoing) in order to provide medical equipment and drugs for IDPs. The main partners involved in the collaboration are LSPs and shipping companies (private sector), no profit organisations (INGOs and other) and the local Ministry of Health. It is an interesting project because no central coordinator is present, but the process is highly standardized: the INGO interviewed selects the suppliers, then the contracted transportation companies deliver towards the Primary Health Centers that then distribute the drugs to the beneficiaries. The government has a central role: it is a sort of "*imposed partner*" because it is the one who approves projects, international NGO, import operations and it is responsible of decision-making. Regarding the agreements just the formalization with the donor is well explained: however, it is highly standardized, and it affects many elements of the collaboration. A typical

challenge is the donor restrictions that can constricted the SC, while probably trust enhances the creation of relations.

In addition, the findings framework has permitted to look at the information about the same dimension (e.g. actors) across all the different case studies as it is possible to see from the Appendix 4: Sample findings framework. It is particularly relevant for the cross-case analysis.

6. Analysis and discussion

At this point, using the data collected, two main types of analysis are performed: a within and cross-case analysis. As said in the methodology chapter (3.3 Research methodology), the unit of analysis is the collaboration project. Only the elements that belong to the cross-sector collaboration project are summarized here in detail while critical contextual elements that are relevant are only reported in the findings chapter (5.2 Findings).

Within-case Analysis

This analysis aims at answering to the second research question: "*Which case-elements, among the cross-sector collaboration ones, can be considered collaboration critical factors (CCF)?*

Firstly, it is necessary to clarify what is a case-element and a CCF to answer the question.

A **case-element** refers to the specific configuration of a collaboration dimensions of the *findings framework* in the case. For example, the coordination mechanisms- decision making dimension is configured in the central coordinator presence.

A **CCF** (*collaboration critical factor)*, instead, is a specific case-element of the project that influences (dependency or an interdependency) the configuration of the higher number of collaborative dimensions. Therefore, a CCF has a central role to determine the development of the collaboration project because it shapes the other dimensions.

In addition, in the analysis two restrictions are performed:

The number of the dimensions among which researching the CCF are restricted to *institutionalization*, *trust* (enablers), *actors*, *coordination mechanisms*.

As it is highlighted in the relative chapter 6.1 Within-case Analysis: the CCFs are well described for each case. However here is selected and described only one more CCF significant for the case.

Case A: Institutionalization CCF

In this case three CCFs are identified however the most important seems the presence of agreements. Indeed, the agreements strongly influences many other collaborative dimensions: firstly, they are different according to the actors because obviously each partner want to establish different requirements. In addition, the agreements set the boundaries of each actor inside the collaboration (in terms of activities and responsibilities) and consequently they define the level of this collaboration. The contracts can also give the assurance that elements of the collaboration like the time span, the resource and information shared, the roles and responsibilities that are formally

written, will be respected. In addition, it is necessary to define and write a clear and univocal metrics (KPIs) to measure the achievement of the agreed objectives. As a result, without this high formalization level the collaboration would be completely different.

Case B: strong central coordinator CCF

In this case two CCFs are identified however the most important seems the presence of a strong central coordinator. Non-profit organization$_{B1}$ influences many other collaborative dimensions: firstly, it receives the mandate and subcontracts the other partners. In addition, the central coordinator is the one who selects the partners because it knows what competencies are needed. It is also the one who defines the KPIs that should be respected by the partners: the central coordinator is the final responsible of the project because it is in charge to accomplish the mission. This actor has a strong power, attributed by background features, that drives to unbalanced dynamics. Finally, if all the partners' contributions need to be reviewed and approved by the central coordinator it is probable that the waiting time increases and consequently also the inefficiency. As a result, without this specific coordination mechanism the collaboration would be completely different.

Case C: Strong central coordinator CCF

In this case one main CCF is identified: the presence of a strong central coordinator. UN$_{C1}$ influences many other collaborative dimensions: firstly, it selects specific criteria to choose the partners because it knows what is needed. Then it contracts the partners and it yearly renews them based on some KPIs and priory agreeing on a specific duration because it has more a transactional relation with them. In addition, the partners are not developing the project on their own, but they are just coordinated by the central coordinator who decides of the whole chain and has no reasons to share the information about the entire chain. Even the other resources are centralized and managed by UN$_{C1}$ who shared them when the partners need them. As a result, without this specific coordination mechanism the collaboration would be completely different.

Case D: presence of the private sector CCF

In this case two CCFs are identified however the most important seems the presence of the private sector. the food needs of well-specified beneficiaries (pregnant women and lactating women) is addressed thanks to an innovative business model based on the transfer of cash voucher. Nonetheless, this model is based on the involvement in the collaboration of a specific profile of actors like the contracted supermarkets (where the women can purchase using the cash vouchers) or the manufacturers of plastic vouchers. This type of actor influences other dimensions: firstly, the NGOs have not the traditional role of distribution because the responsibilities have shifted from a higher level in the SC to a lower one (directly the supermarkets supply and distribute the foods). Then the supermarkets presence permits different outcomes: thanks to economic transactions they encourage the restart of the local economy and then their involvement ensures to the women a higher level of satisfaction as they can purchase in function of their needs. Finally, a challenge can arise because the involvement of local supermarkets implies the necessity of an adequate amount

of food supplies within the local market with the possibility of a higher inflation risk. As a result, without this specific actor the collaboration would be completely different.

Case E: pooling of resources CCF

In this case three CCFs are identified however the most important seems the pooling of resources. Indeed, this is at the base of the business model introduced in the case and it influences many other collaborative dimensions: firstly, it is influenced by the number of actors. Indeed, higher is the number of partners and lower should be the capital invested to pre-finance resources shared and guarantee the long-term economic sustainability of the mechanism. Similarly, the pooling imposes some requirements, sort of selection criteria: standardized items shapes and high capital for the pre-financing. In addition, the lack of supply chain visibility information affects the resources management that is less effective. Also, it is interesting that the pooling of resources is not formalized because it is not decided who are the owners of the resources and as a result the agreements are lower formalized. Supply chain risks and the efficiency of the collaboration are also affected by this dimension. As a result, without the pooling of resources the collaboration would be completely different.

Case F: the presence of private sector CCF

In this case two CCFs are identified however the most important seems the presence of private sector. Indeed, it was the real initiator of the disaster response and for this reason it influences many other collaborative dimensions: firstly, it is the real initiator because they are the ones who have the capacity to immediately and quickly respond and they have this "*basic inclination*". Its presence strongly affects the resource dimension giving to the partners to access to resources that probably would not be so easily available. Finally, this actor influences two outcomes: assessment of private sector's strength for future disaster and the quick response even without waiting the arrival of the INGOs or of the government who came along the time. This fast involvement is possible thanks to the capacity they have in terms of resources and willingness. As a result, without this type of actor the collaboration would be completely different.

Case G: the government CCF

In this case two CCFs are identified however the most important seems the presence of the government. Indeed, this type of actor is in some ways imposed in the collaboration but its presence influences many other collaborative dimensions: firstly, it has a strong power because it gives many permissions (to implement a project, to accept INGOs, to import goods) and the resulting relationship dynamics are surely unbalanced. Similarly, as this strong control is very critical the information about governmental processes and permissions are well shared among the partners. In addition, as said, the government can influence which actors are involved in the collaboration: only approved actors can be included. Finally, it is involved in the last mile distribution because it has a widespread network which could supply directly the beneficiaries. As a result, without this type of actor the collaboration would be completely different.

In order to overview the CCFs a synthesis table is reported (Table 0.3), where for each CCF (the case element) it is identified the collaboration dimensions which it belongs and then when in the

different cases this element is present: when the CCF is present the number of relationships it has with other collaboration dimensions is reported.

CCF (case element)	Collaboration dimension	Case A	Case B	Case C	Case D	Case E	Case F	Case G
Presence of agreement	*Institutionalization*	7	5					
Previous relation	*Enabler*	3					3	
Government	*Actors*	5						4
Strong central coordinator	*Coordination mechanisms*		5	7	4	4		
Private sector	*Actors*				4	7	4	
Pooling of resources	*Resource sharing*					6		
Donor	*Actors*							4

Table 0.3: Synthesis CCFs across cases

As it is possible to see mainly seven elements are identified as CCFs.

What can be concluded from the within analysis is related to the identification of these CCFs: maybe they are case-specific element but some of them seems recurrent in the different cases. This has driven the cross-case analysis: the CCFs are the starting point to identify among which collaboration elements look *"which are the more recurrent and relevant patterns?"* [RQ3]

Cross-Case Analysis

As said, this part of the analysis aims to explore deeply the elements of the cross-sector collaboration across the different cases and to answer the third research question: "*Among the collaboration elements, which are the more recurrent and relevant patterns*?". The elements analyzed here are the CCF identified in the within-analysis because the implicit assumption is that the relevant patterns are related to these CCFs.

Each CCF is analyzed across the cases: Firstly, all the information related to the dimensions influenced by the CCFs and other relevant features are collected and then patterns, or common differences, are identified. The outcomes of this process are summarized in *insights* (when they are just describing the patterns present) *or suggestions* (when from the patterns are derived some indications about how to configurate these elements or about how they impact the success). Then, they are logically justified and critically compared with the existing literature to corroborate their consistency, enrich them or identify the weaknesses.

The cross-case analysis consists of four sections, each one related to one of the most relevant CCFs: the private sector, the presence (and role) of the government, the central coordinator and the presence of agreements. A brief description about the reasons and the features that have driven these results is available divided by CCF. For more details see 6.2 Cross-case analysis.

Private sector

The presence of the private sector is a CCF in three case studies. For this reason, the analysis of this element's criticality is extended to a comparison across the cases. The features collected for

all the cases are about: decision making aspects, source of expertise and resources, value added to the collaboration and their interest or earns.

The presence of the private sector is confirmed in all the what can be observed is:

Insight (1): *the presence of the private sector always positively influences the outcomes of the collaboration*. The reason of this success seems explained by the fact that private sector compensates lacks in the HSC (resources and expertise) and humanitarian organizations need this actor to obtain them and to have a better outcome of the project itself. The private sector as actor who increases the relief outcomes is confirmed by the literature.

Secondly, combining the Hos perspective with the private sector's one it seems that in all the cases it has an interest to get involved in the project (e.g. exploit a not used working capacity) and what can be concluded is:

Suggestion (1): *The collaboration with the private sector is successful when its involvement is a win-win relationship*

Indeed, in the cases analyzed the relations seem win-win when both the parties need and earn from each other. On one hand the collaborative outcomes linked to humanitarian aims are higher (e.g. the HOs have a higher efficiency). On the other hand, the private sector has an interest in providing a good service (that can be not linked to the social aim): it can gain something and if the relation goes wrong it will lose this award. As a result, this mutual interest could be the key aspect that permits a successful relation. The literature confirms and adds insight on this suggestion (David Swanson & Smith,2013; Falagara Sigala & Wakolbinger, 2019).

Finally observing the data (especially the *decision making, source of expertise, source of resources* dimensions) it is possible to identify some patterns in terms of level of relation. What can be concluded is:

Insight (2): *When the private sector is involved the relation can be at two level, operational or strategical.*

- ***Operational****: it is an outsourcing relation; the private actor is not involved in the decision making (it is not a consortium partner) and it is just a source of resources for the collaboration.*
- ***Strategical****: it is a more collaborative relation; the private actor is involved in the decision process (it is a consortium's partner) and it provides the expertise and not just the resources.*

It seems reasonable because, firstly it is typical of the collaboration in the SC between business partners; secondly it is clear that if the private sector is just a passive actor that gives donations (cash or in-kind ones) or sells its service providing resources (e.g. Case C), the relation is very different compared to when the actor is involved actively (e.g. Case E-PS_{E1}) and it has the right to be considered and involved in the decisions. Finally the literature confirms and adds insight on this idea (Falagara Sigala & Wakolbinger, 2019; Balcik et alt.,2010; Nurmala, de Leeuw, & Dullaert, 2017).

Government

The presence of the government is a CCF in two case studies. For this reason, the analysis of this element's criticality is extended to a comparison across the cases.

The features collected for all the cases are about: the necessity for the other partners of its approval and permissions, if it is responsible for the coordination, if it performs activities in the collaboration and if it has a dedicated structure to respond the project's needs.

The presence of the government is confirmed in all the cases and it seems possible to recognize two different role it can have: *active* or *passive*. Active is when the government coordinates or directly performs one or more main activities of the collaboration project (e.g. distribution to the beneficiaries). This permits to conclude:

Suggestion (2): *The presence of the government is critical when it has an active role in the collaboration.*

This seems reasonable because when it is operatively involved in the collaboration it should be considered as all the other partners. And probably when it has an active role, it has the authority and the strength to shape the collaboration. The cases supported this suggestion while in the literature not explicit evidences are available.

A second observation is that the local government has always the responsibility necessary to establish a collaboration, but it is not always responsible of the coordination of the projects as highlighted in its features (*Permission*, *Coordination mechanism*, *Dedicated governmental structure* column). From this observation it is derived:

Insight (3): *The government is always responsible to approve the project, but it is responsible to coordinate the actors if it has a structure dedicated to serve the aim of the project and it is an adequate structure.*

This is verified by the case A, F and G: In the first one the NMEC is linked to the District Health Management Team that are at a district level. It seems that this structure, that pre-exists before the collaboration, is exploited during the collaboration and gives to the NMEC a coordinating role; while in the case G, even if the structure is present it does not have an adequate size, power, resources to play the coordination role in an international SC. Some insights from the literature are available (Cozzolino, 2012; Day *et al.*, 2012; Luna, 2001; Balcik et alt., 2010).

Central coordinator

As it is possible to see from the within analysis the presence of the central coordinator is a CCF in four case studies (Case B, C, D, E). For this reason, the analysis of this element's criticality is extended to a comparison across the cases. The features collected for all the cases are about: the role as selector and evaluator of other partners, responsible of decision making, and if it is/ it is not responsible for the centralization of the resources and information.

The presence of the central coordinator is confirmed in all the cases, excluding case G, and it seems possible to recognize two different profiles it can assume: *weak* and *strong*, as highlighted:

Insight (4): *When there is a central coordinator in the collaboration it can assumes two types of profiles, weak or strong.*

- ***Weak**: when the central coordinator is not a selector, nor responsible of decision making, nor defining the performance measurement and the management of resources is not centralized by it (decentralized).*
- ***Strong**: when the central coordinator is a selector, responsible of decision making, defining the performance measurement and the management of resources is not centralized by it (centralized).*

From the literature some scholars (Steigenberger, 2016; Balcik et alt., 2010; Lu & Xu, 2015; Van Wassenhove, 2006) could be link to these profiles but not explicitly.

In addition, it is possible to see a pattern between the criticality of the central coordinator (CCF) and its type of profile that drives to

Suggestion (3): *The central coordinator presence is critical when it is a strong central coordinator.*

The suggestion seems reasonable because a strong coordinator has the power to influence many other dimensions and collaboration elements and it shapes the relations and the collaboration itself according to its view. Only Akhtar, Marr, & Garnevska, (2012) and Steigenberger, (2016) seem linked, in some way, to this suggestion.

At this point it is possible to further investigate the reasons why these two profiles exist. Indeed, the idea is the fact that the configuration of a specific type of profile is adequate for a specific situation or better it changes according to the presence of specific collaborative dimensions. Here the dimensions studied are trust presence and international/local actor.

Regarding the trust it can assume two values: strong or weak. Strong if there are previous relations and it is quite immediate the presence of trust, weak in the opposite case. The comparison with this dimension has concluded:

Insight (5): *The central coordinator profile changes according to the trust's level, two situations are identified:*

- ***Situation 1**: When there is a strong trust due to previous relations, there is a weak central coordinator in the collaboration.*
- ***Situation 2:** When there is a weak trust due to previous relations, there is a strong central coordinator in the collaboration.*

Suggestion (4): *The only possible configurations of central coordinator profile and level of trust are the Situation 1 (strong trust and weak central coordinator) and Situation 2 (weak trust and a strong central coordinator)*

They identify these situations as the only possible. It is justified from a logical perspective, but not specific literature is available.

Regarding the central coordinator geographical presence, it can assume two values: local or international. Local when the actor has his headquarters within the country where the collaboration takes place (for example it is a local NGO), international otherwise. The comparison with this dimension has led to

Insight (6): *The central coordinator profile changes according to its geographical presence, two situations are identified:*

- ***Situation 1****: When the central coordinator is local, there is a weak central coordinator in the collaboration.*
- ***Situation 2:*** *When the central coordinator is international, there is a strong central coordinator in the collaboration.*

Suggestion (5): *The only possible configurations of central coordinator profile and geographical presence are the Situation 1 (local and weak central coordinator) and Situation 2 (international and a strong central coordinator)*

They identify these situations as the only possible. It is justified from a logical perspective, but not specific literature is available.

Agreements presence

Regarding the presence of agreement, it is highlighted as a critical factor in the case A and B.

This is the reason why it could be interesting to investigate better the insights and the patterns across the cases related to this dimension.

The information collected about these elements are if the agreements are present in the project, if they seem useful in the collaboration, the content of the agreement. The comparison about this information allows to identify the main functions of the agreements, as stated:

Insight (7): **the agreements can have four main functions that are**

1. *Define common and/or individual objectives and how to measure the achievement of them*
2. *Define the reciprocal roles and responsibilities*
3. *Define the scope of the relation (time span, resources involved, information shared, etc)*
4. *Define contingent rules about the commercial transactions (commercial specifications, prices, quantities, etc)*

The scarce literature retrieved about the agreements seems to confirm the insight (7).

Furthermore, the agreements presence is compared with other dimensions investigated and the trust presence reveals some interesting patterns.

The trust it can assume two values: strong or weak. Strong if there are previous relations and it is quite immediate the presence of trust, weak in the opposite case. The comparison with this dimension has concluded that it is possible to work without agreements because the functions 1. 2. 3. of the agreements identified above are compensated by the trust. However, trust cannot

compensate the fourth function of the contracts identified because it doesn't compensate the contingent rules about commercial transactions. This leads to the following suggestions:

Suggestion (6): *it is necessary either the presence of trust or the presence of agreements to collaborate*

Suggestion (7): *having an agreement even in the presence of trust is better because it is clearer the definition and because it enables to specify the contingent information.*

The case A and E are particularly significant to the suggestion (7) because in these cases it emerges that the agreements are useful, but they cannot substitute the trust necessary to build the relation among the partners.

The literature seems support these suggestions even if maybe the perspective is slightly different.

7.Conclusion and Limitations:

Research implications

The innovative contribution of this research is the attempt to explore with a complete overview the cross-sector collaboration phenomenon including all its typical elements. A first contribution is the fact that well defined dimensions are used to collect the data for both the literature and the empirical.

Secondly the critical factors identified in the within analysis are an innovative contribution: just few authors quote the presence of specific critical factor in the HSC and even less in the collaboration focus.

Thirdly the identification of insights and suggestions comparing different cases of different disasters is not strongly used. Indeed, the majority of the scholars try to identify insights within a specific disaster because there are many context-specific elements, but the results have a low level of generalization. In addition, at least in the sample analysed, just three authors specifically perform a SLR on the cross-sector collaboration and the analysis has also permitted to cover some of the gaps identified with the SLR. Finally, the research contributes to investigate a topic that is characterized by a low research maturity.

Practical implications

The thesis also aims to enhance the humanitarian supply chains on the field: firstly, it highlights some critical and not obvious aspects that could be neglected or underestimated by the practitioners. The suggestions or insights formulated could be used by the practitioners as a checklist to have a more complete overview when they evaluate their collaboration projects or when they implement a new one. Especially briefly the main aspects are:

Involvement of the government: Check to have the approval of the government before starting the project. If the government is an active player, pay attention and deal with its initiatives.

Involvement of private sector: If the collaboration project lacks resources and expertise check if it is possible to involve the private sector in a win-win relation to improve the outcomes of the collaboration.

Central coordinator: Check the presence of a central coordinator, and if its profile is coherent with the other project dimensions.

Agreement: Sign agreements to establish the contingent information about the collaboration relation.

Study Limitations

Regarding the limitations the main aspect to be underlined are briefly reported here.

The main methodological limitations regard the use of semi-structured interview technique which leads to a low standardization of the findings across the cases. In addition, in the within and in the cross-case analysis a restriction of the scope is performed: five dimensions are mainly analyzed in the within and then patterns are identified among the CCFs.

In terms of sample variety some limitations are highlighted. The sample does not include any case which explore the perspective of the militaries or of the government. In addition, in terms of sources the case studies are built crossing different sources: the interviews, other primary data from the company interviewed and secondary data. The sources used could bias the perspective of the case and affect which are the contents retrieved (e.g. the managerial level of the respondents affect their answers, the lack of other sources in some cases).

Future research directions

The researchers could integrate the study of the CCFs of the collaboration with new insights about the effect of the CCFs themselves on the outcomes trying to identify critical collaboration success factors (CCSFs). Another direction for the future research may be to further investigate and develop the insights about the analyzed dimensions: institutionalization in terms of the more adapt agreement to the situation, exploit the possible synergies between the private sector and humanitarians studying a cultural perspective, investigation of other coordination mechanisms (excluding the central coordinator) to identify in which situation is better to use each of them. Finally, it could be followed our research patterns confirming or modifying the results achieved (CCFs, insights and suggestions) and comparing it with further case studies including also the militaries and governmental perspective.

1. Introduction

In the disaster management field, there are different opinions about the trend of the number of disasters worldwide. According to some sources of data the frequency of disasters is stable along the years and there is not a real increasing trend[1]; however, some other sources report an increasing trend[2].

A clear worrying data is that neither the number of deaths due to natural disasters is decreasing[3] nor the costs to face them[4]. The reasons could be different (e.g. a higher impact of disasters, sudden and unforecastable events) but, from the researcher's perspective, perspective, what emerged is the clear need to increase the efficiency and effectiveness of the disaster relief operations.

This is particularly true nowadays: the world is dramatically witnessing the evidence of the need to increase the efficiency and effectiveness of the disaster relief operations due to the sudden outbreak of Corona virus all around the globe. An emergency without any precedence.

It emerges that to increase the effectiveness and the efficiency of disaster relief operation it is necessary to improve logistics operations and more precisely, supply chain management, because "*disaster relief* [costs] *is about 80% logistics*" (Van Wassenhove, 2006b).

Enlarging the perspective on the humanitarian aid, it is important to observe that it is not just a matter of costs; on the contrary, it deals with preserving human lives. Indeed, "*the success of any humanitarian operation is directly attributable to the logisticians' efficiency and effectiveness in getting the necessary people and supplies to the right place quickly*" (Overstreet, Hall, Hanna, & Kelly Rainer, 2011) and as a consequence the efficient management can "*avoid further human losses*" (Natarajarathinam, Capar, & Narayanan, 2009).

From this practical necessity the academic world started, in the recent years, to examine in depth the Humanitarian Logistics field or the Humanitarian Supply Chain[5] (reference 2.1 Definition for more details).

Analysing the current situation seems that it is increased the level of awareness, and both academics and practitioners are reacting with different initiatives: academic professional societies with focus on the HSC, dedicated journal — the Journal of Humanitarian Logistics and Supply Chain Management in 2011-, expo and fairs, International NGOs now have a business unit dedicated to this aspect (e.g. WFP, INTERSOS), humanitarian organizations are specialized on Logistic, Transportation and SCM (Transaid, Help logistic, Atlas logistique) or the OCHA's Logistic Cluster.

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1 "EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - UCLouvain - Brussels - Belgium" Created on: March 3, 2020
2 https://www.economist.com/graphic-detail/2017/08/29/weather-related-disasters-are-increasing , access on 1/03/20
3 "EM-DAT: The OFDA/CRED International Disaster Database - www.emdat.be - UCLouvain - Brussels - Belgium" Created on: March 3, 2020
4 Collection of different articles on the Statista website*: https://www.statista.com/statistics/510959/number-of-natural-disasters-events-globally/* and *https://www.statista.com/statistics/510952/number-of-deaths-from-natural-disasters-globally/* and *https://www.statista.com/statistics/612561/natural-disaster-losses-cost-worldwide-by-type-of-loss/* access on 1/03/20
5 "The system that is responsible for designing, deploying and managing the processes necessary for dealing with not only current but also future humanitarian/disaster events and for managing the coordination and interaction of its processes with those of supply chains that may be competitive/complementary." (Day et al., 2012)

These efforts are contributing to improve the disaster response; however, they are not enough to develop efficient and effective humanitarian supply chains. To consistently improve them, uncertainty should be reduced, minimized, or even eliminated. However, this is quite impossible in the HSC context: the "*product*" itself is uncertain in its nature. For this reason, it is central to understand which are the critical elements for the success of HSC and try to stress them (i.e. collaboration).

Along the years, collaboration has been recognized as a key in the disaster response by who is involved in the field improvement: practitioners and researchers.

Indeed Pettit & Beresford, (2009) identify collaboration as one of the key success factor (KSF) fundamental in "*achieving integration and efficiency in logistics networks*". Also Leiras et alt., (2013) quote, in their literature review, collaboration among actors as one of the main challenges to effectively respond to disasters (Kovacs and Spens,2007; Akhtar et al., 2012).

From the practitioners side it emerges: "*In a world threatened by a changing climate, increasing conflict and growing inequality, where many countries seek to close their borders to those in need, we know that we can only build a stronger future through collaboration […]"* (Mercy Corps, Priorities for 2020[6]). They are just one of the many international and local NGOs or governmental agencies that underline the necessity to build strong "*partnerships based on mutual respect, trust and confidence*" because in this way "*we will collectively be able to do more for the people we serve*" (OCHA, 2018). This is remarked also by the seventeenth Sustainable Development Goals: "*Partnership*" is considered essential in any sector because "*the sum is greater than the total of the parts*".

COVID-19, as a public health crisis without precedents in living memory, is a strong proof of this necessity: is testing our collective capacity to respond. This crisis, which knows no borders, requires a whole of government, whole of society response: joint actions are the only possibility to win this war. "Together, we still have a chance to stop the worst spread of this virus attacking our species, if we can bring our best to the fight". A further linkage between the thesis and the COVID emergency is present in the chapter Afterword: COVID-19 emergency.

But at this point a question arises:

Why does everybody recognize collaboration as essential in the humanitarian supply chain?

Firstly, it is important to highlight some contextual elements typical of the humanitarian field.

A key context's characteristic is the multiplicity and the high number of actors involved due to the huge size of the problem (Altay, 2008): many donors, humanitarian organizations (HOs), governments, civil protection and military bodies, private sector, philanthropists, media rush on the field.

[6] *https://europe.mercycorps.org/en-gb/blog/priorities-2020*

A second element to be considered is the diversity of the actors involved: they are characterized by differences in terms of nature, size, operational compatibility, interorganizational competition, partner's power disparity, and coordination processes (Chandes & Pache, 2010; Van Wassenhove, 2006a).

This diversity and the high number of partners involved, which is growing (Chandes & Pache, 2010; Lewin et al., 2018), creates bureaucratic, communication and collaboration difficulties (Altay, 2008; Day et al., 2012; Moshtari & Gonçalves, 2017).

Nonetheless, it is clear that the contribution of each of them can play a crucial role, but if they closely collaborate, it is easier to achieve the common goal of efficiently and effectively bring the necessary items and services to the people in need (Lewin, Besiou, Lamarche, Cahill, & Guerrero-Garcia, 2018). A collective strategy seems the only solution in opinion of Chandes & Pache, (2010).

In addition, it is important to consider a third element: due to the presence of many INGOs it is easier that each organization involved develops its own logistic office to deliver missions and, as a consequence, overlapping, duplications, wastage can easily arise (Lewin et al., 2018; HLA website[7]).

Finally, it seems essential the collaboration even in the recovery: local and international actors need to collaborate to ensure the long-term local sustainability. "*Equal partnerships between international and local actors and to pursue full integration of national and local actors in coordination mechanisms at all levels*" (HNPW 2020[8]) are extremely important.

Both the academic and practitioners' world seem have understand that is not possible to imagine a future without showing to *"the world that we are indeed stronger when we work together*" (Mercy Corps, Priorities for 2020[9]).

In the last decade many different initiatives have arisen: practitioners have initiate the UN Cluster System, the Inter-Agency Standing Committee by UN system, conferences and fairs with a focus on collaboration topics like IFRC Fleet Forum Conference of 2011 on the theme "'*Growth through Collaboration*", organisation founded in order to coordinate and facilitate the collaboration (HLA, OCHA) and increasingly involving the private sector in this field. But also, in the academic perspective literature studies on collaboration are recently increased (Altay, 2008; Nurmala, de Leeuw, & Dullaert, 2017). However, further research is required to create mature and generalizable results (Naor, Dey, Goldstein, & Rosen, 2018; Nurmala et al., 2017, 2018).

A final specification should be pointed. Leiras et alt., (2013) literature review underlines a gap: many scholars focus on collaboration starting from a single perspective, but it seems relevant to enlarge this view to study the interaction between stakeholders. For this reason, other academics (Lewin et al., 2018; Van Wassenhove, 2006) and practitioners (like OCHA, 2018; HNPW 2020[10];

7 https://www.humanitarianlogistics.org/new-research-on-addressing-hum-log-challenges-and-improving-relief-operations/
8 https://www.aid-expo.com/blog/324-the-power-of-partnerships-and-communication-in-crisis-response-settings
9 https://europe.mercycorps.org/en-gb/blog/priorities-2020
10 https://www.aid-expo.com/blog/324-the-power-of-partnerships-and-communication-in-crisis-response-settings

HLA in 2019 International Transport Forum[11]) prioritize the so called "*cross-sector collaboration*". It can be defined as the "*set of activities that involve collaboration between organisations that are based in three sectors: the state (government), the market (business) and civil society (such as NGOs or non-profits)*" Waddell and Brown (1997).

An authentic interest about the management of HSC, the awareness about the importance of collaboration in this field, the recognition that the literature is not mature, and that research is strongly needed, led the choice of the focus for this research. This work aims at investigating how to make the disaster relief more effective focusing on the HSC side and in particular it will analyze how the cross-sector collaboration can contribute.

In particular three main research questions (RQ) emerge:

RQ1: "Which are the main elements of cross-sector collaboration in HSC?"

RQ2: "Which elements, among the cross-sector collaboration ones, can be considered collaboration critical factors (CCF)?"

RQ3: "Among the collaboration elements, which are the more recurrent and relevant patterns?"

The *RQ1* is broad and is addressed through the first part of the thesis, the systematic literature review (SLR). Through the SLR all the main elements of the cross-sector collaboration are identified. The innovative contribution is that the collaboration is not analysed with a single perspective but the research takes into consideration at the same time all the relevant dimensions of the collaboration (for example not assuming specific actors' perspective or focusing on technical aspects like the communication challenge). In particular, seventeen dimensions are used to describe and analyse each cross-sector collaboration.

The *RQ2 and RQ3* are addressed through the second part of the thesis: seven real case studies are analyzed according to all the dimensions identified. In particular, the cases are real projects characterized by a cross-sector collaboration. Semi- structured interviews and other primary and secondary sources permit to collect the necessary data. This work allows to identify which elements are collaboration critical factors (CCF) and if there are some relevant patterns that are more common.

This research is organized as follow. **Section 2** contextualize HSC background and the challenges that characterize the context, **Section 3** explains the methodology of the research, **Section 4** describes the state of art's investigation reporting the findings and a critical discussion of the SLR. **Section 5** reports the findings divided by project and some details about the data collection; while in **Section 6** are reported the results of the two analysis performed: the within-case analysis and the cross-case analysis. Finally, conclusions and limitation of the research are clarified in **Section 7**.

[11] *https://www.humanitarianlogistics.org/hla-highlights-need-for-multi-sector-collaboration-at-humanitarian-logistics-conference/*

2. HSC: Background and challenges

From the beginning of the research project, it is clear that neither a strong supply chain background nor a humanitarian aid knowledge one could be enough to cover the necessary knowledge to develop a research in the humanitarian supply chain field.

Indeed, Humanitarian Supply Chain (HSC) is a specific field characterized by singular features; therefore, it appears to be fundamental to familiarize and deeply investigate this sector before the research starts.

To develop a proper knowledge, the most relevant papers in the field have been reviewed. The sample is composed by research projects drafted by the main scholars in the humanitarian supply chain. Then, the most peculiar elements emerged from this study have been summarized in seven main categories.

2.1 Definition

The starting point to define HSC is the concept of Supply Chain Management (SCM).

HSC is a subcategory of SCM so it is necessary to detect what is SCM in general to determine what HSC is specifically.

Indeed, there are some common elements of all the supply chains, but the change of environment strongly affects how these elements are combined and so how supply chains are formed, deployed and changed (Day, Melnyk, Larson, Davis, & Whybark, 2012).

The SCM is defined as *"[…] an integrating function with primary responsibility for linking major business functions and business processes within and across companies into a cohesive and high performing business model. It includes all of the logistics management activities, as well as manufacturing operations, and it drives coordination of processes and activities with and across marketing, sales, product design, finance, and information technology".*[12] (Council of Supply Chain Management Professionals (CSCMP))

When SCM is implemented in the delivery of humanitarian aid (HA) it is possible to use the term Humanitarian Supply Chain (HSC). The objective of the SCM, in this specific context is to give aid and assist people in their survival in a timely and cost-effective manner (Pettit & Beresford, 2009).

In addition, to understand what HSC is, it is appropriate to clarify the difference between Humanitarian Supply Chain (HSC) and Humanitarian Logistics (HL) because sometimes, in the HSC field, the two terms are used as synonyms.

[12] *Council of Supply Chain Management Professionals (CSCMP), Supply Chain Management – Boundaries and Relationships, access on the internet on 12/1/2020 extracted by https://cscmp.org/*

Firstly, HSC has a broader view: the system rises not just when the disaster has occurred but also for current and future humanitarian disaster events. For this reason, HSC involves preplanning, activities' integration of the different actors and evaluation of the desired output. In this project the reference HSC definition is:

"The system that is responsible for designing, deploying and managing the processes necessary for dealing with not only current but also future humanitarian/disaster events and for managing the coordination and interaction of its processes with those of supply chains that may be competitive/complementary." (Day et al., 2012)

HL, instead, is focused just on response during a single event. The aim is to match demand with supply in a timely and cost-effective manner; so, in this case the focus is on the operations and execution (Day et al., 2012).

In this project the reference HL definition is: *"The process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from point of origin to point of consumption for the purpose of meeting the end beneficiary's requirements*". (Thomas and Mizushima, 2005).

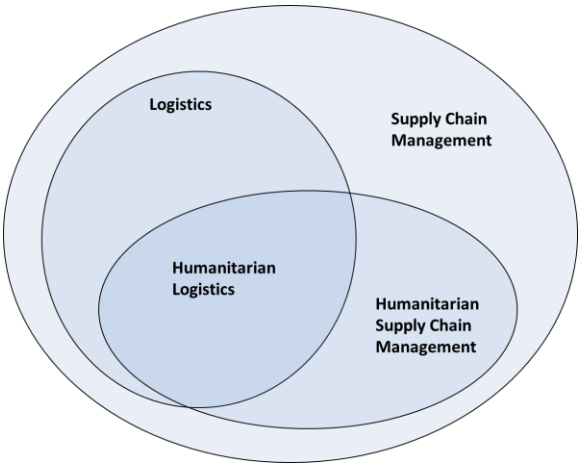

Figure 2.1:Venn Diagram Depicting Relationships among SCM, Logistics, HDR Logistics, and HDRSCM (Day et al., 2012)

All the relations explained between the different terms are well represented in the Figure 2.1. SCM is the broader umbrella which contains the logistics. The humanitarian field could be considered a specific sector of SCM and Logistics but the relation between these two latter elements is the same of the SCM view.

2.2. Actors

HSCs combine the efforts of many different actors, so they are *"essentially networks of organizations working for the same objective"* (Altay, 2008). The main reason for the presence of many actors is that it is almost impossible for a single organization to fulfill the needs of people affected or to rebuild the infrastructure alone. Usually even just because the size of the disaster is

huge. Hence, different organizations come together to react to these disasters: they provide the help and the assistance needed combining their efforts (Akhtar, Marr, & Garnevska, 2012; Altay, 2008).

It is important to notice that even if each actors involved has the same general goal, their primary motives, missions and operating constraints may differ (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2010). So, it could be useful to fully understand the individual features of them because the different objectives may affect the level of commitment of the actors involved and, as a consequence, the success of the relief operations (Tomasini & Van Wassenhove, 2009).

The classifications from previous researches could help to identify the main actors and their objectives. In particular, the main references for this research are the classification by Kovács and Spens (2007) by Cozzolino et al. (2012). These classifications are the starting point to identify the main actors' categories.

2.2.1 Humanitarian organizations

These are the primary actors of the HSC: they assess the demand and they try to reach the final customers through different channels (Kovács & Spens, 2007). Usually they are non-governmental organizations (NGOs).

The literature highlights some common features and challenges to their work during HA.

For example, sometimes they do not have the necessary resources to face the emergencies and for this reason they may be in competition one against the other to get access to the limited resources available (Kovács and Spens, 2007). They also lack of technical competencies and logistics skills within the organization (Van Wassenhove, 2006).

Nonetheless, this category includes organizations very different one from the others in terms of size, nationality, and mission: they could be global actors but also small regional and country-specific aid agencies (Thomas and Kopczak, 2005; Long, 1995).

In particular, this research will follow the classification of NGOs by Lu and Xu (2015). They propose a categorization according to the NGOs' geographical coverage, provenience and their relationship with the government, they identify three categories:

International NGOs (INGOs): these NGOs have the headquarters in foreign countries. INGOs are regarded as important for their capacity to deal with development matters such as poverty alleviation, sustainable development and human rights (Madon, 1999).

Government organized NGOs (GONGOs): These organizations have relationships with government; they are created by a government or by one of governmental agencies and they are actively involved in social welfare and public affairs.

Civil NGOs (CNGOs): *"These NGOs are local and traditional. CNGOs have played an important role in self-aid and long-term reconstruction."*(Lu & Xu, 2015). Often, they can be called also Local NGOs (LNGOs).

2.2.2 The military

The militaries have been called in many occasions to provide humanitarian assistance (O ¨zdamar et al., 2004).

They are involved in large scale disasters for different reasons: they have adequate equipment, financial resources and trained workforce that is available when the demand arises (Rietjens et al., 2007; Kovacs and Tatham, 2009). In addition, military organizations have the robustness to operate in harsh field conditions during response operations (Graham Heaslip, 2013).

Otherwise, it is difficult to design a relationship with them and to set the boundaries among military and humanitarian operators.

The challenges of this collaboration are linked to the fact that humanitarian agencies and military are very different by nature. Firstly, they usually have different organizational structures (Dubey, Altay and Blome, 2017): the military force has well-defined structure, precise boundaries and controlling mechanisms; and they are usually coordinated from one specific coordination center (O ¨zdamar et al., 2004; Roosevelt, 2005). Furthermore, the military units are functionally organized whereas the NGO's ones are geographically organized (Dubey, Altay and Blome, 2017). In addition, militaries are mission oriented and they carry out the necessary actions to reach an objective; while humanitarian agencies are development oriented (Dubey, Altay and Blome, 2017; Long, 1997).

However the main difference regards the principles: the main objective of military forces is fight wars, so their involvement in disaster relief operations is seen by some NGOs as a risk for neutrality (which is one of the principles that shapes the humanitarian space (van Wassenhove, 2006)). This is particularly challenging if the disaster area has a history of military or political tension.

Nevertheless, the presence of militaries seems necessary to ensure security when the disaster area suffers from war, internal conflict or looting (Dubey, Altay and Blome, 2017).

2.2.3 Government

The government's involvement is very common, but it may regard not just the engagement of the local one but also neighboring country governments and other country governments within the international community.

Local governments are fundamental actors of the HSC as they are *"the activators of humanitarian logistics stream after a disaster strikes"* (Cozzolino, 2012). Generally, this happens because they should have the power to control the situation and mobilize resources in the first stage, when time is a critical element and the coordination by command seems to be the most effective mechanism (Van Wassenhove, 2006).

However, at the same time, this could be a source of disadvantages because governments may lack the necessary experience and knowledge required to manage emergencies effectively, especially

when the effects of disasters are overwhelming (Balcik *et al.*, 2010). In addition, other actors are obliged to abide to their laws: no international action can be taken if the local government does not authorize it, with the exception of national aid agencies and militaries (Cozzolino, 2012; Day *et al.*, 2012).

Furthermore, the host governments are usually responsible to establish protocols and to take action for reducing the probability of disasters during the preparation phase (Cozzolino, 2012).

It is possible to enlarge the definition of the government category including in it the "*public authorities*". They are the governmental agencies of all levels (city, federal or state level) which are responsible for civil defense operations together with the respective operative units (e.g. fire departments, ambulances or official technical support agencies) (Wimelius & Engberg, 2015).

2.2.4 Private sector

The private sector involvement is increasingly growing in the humanitarian relief environment (Cozzolino, 2012).

This category mainly includes for-profit companies, companies which have as main mission the creation of economic value to respond to their shareholders or to their owners (Andrea Binder and Jan Martin Witte, 2007). They are completely different from the other humanitarian actors who firstly respond to the needs of the beneficiaries. This is the reason why, as Nurmala et al. (2017) indicate, the number of partnerships between the business sector and the humanitarian sector in managing humanitarian logistics is still limited. In this research, the term "*private sector*" refers just to for-profit companies.

However, this category seems very strategic in the humanitarian context; humanitarian actors, could greatly benefit from the participation of the private sector because it is a rich resource to manage materials, service information and capital flow (Li *et al.*, 2019). In addition, it is a convenient relationship also from the private sector perspective: firstly, the humanitarian relief word could be seen as a multi-billion-dollar market (Li *et al.*, 2019). Secondly, the involvement of private sector can be motivated by non-economic benefits (e.g. brand images, corporate social responsibility and staff motivation) (Balcik *et al.*, 2010). Finally, the local private companies are interested in humanitarian operations also because, in case of disaster, the population affected is their market. If they contribute to help disaster relief, they can mitigate the disaster effects on their businesses (Jordan & McSwiggan, 2012).

It is interesting the result of Cozzolino (2012), who classifies the main contributions of private sector in the HSC in the following three roles.

Donor: it is a company which supports humanitarian logistics giving financial contributions (in cash) to fund aid operations (Financial contributions comprise the most common type of resource delivered (Nurmala, de Leeuw and Dullaert, 2017)).

Collector: it is a company which gather financial means from its customers, its employees, and its suppliers in order to fund aid operations.

Provider: It is a company which offers its goods and services for free (in-kind donation) or as a consequence of a selling action.

2.2.5 Media

This category is not included in the supply chain itself; nonetheless, in the humanitarian organizations' perspective the press presence is a very powerful player of HA. On one hand, it awakes the interest of public and institutions about the disaster and the needs, helping to generate donations; on the other hand, it can address attention toward breakdowns or problems about the performance of the supply chain (Day *et al.*, 2012). This correlation between the media's coverage of a disaster and political and donor activity is known as the *"CNN effect"* (Thompson, 2010).

In addition, press influences the relationships among HOs because it may lead them to competition (Day *et al.*, 2012): organizations compete to seek visibility and to potentially attract more resources from major donors and the public. Sometimes media pressure makes them act in ways that are contrary to what they believe is appropriate in a given situation (Day et al., 2012).

2.2.5 Donors

It is important also to focus the attention on the donors' category which is a fundamental enabler of relief operations. Many relief organizations rely just on donor funding and they cannot participate in a disaster response before funding becomes available (Seaman, 1999).

In addition, donors have a great influence on relief operations setting precise constraints.

Indeed, to meet the donors' requirements, humanitarian actors sometimes are under pressure: they need to spend the available money in a short period of time (Moore, Eng and Daniel, 2003) or the donors may restrict the relief activities funded (Stephenson and Schnitzer, 2006). In addition, donors demand great accountability, therefore relief organizations have to justify their their actions to them (Thomas and Kopczak, 2005).

Nonetheless, usually the donations are an uncertain factor of HSC: they are variable and sometimes even unwanted, in particular the in-kind donations (Kovács and Spens, 2007).

2.2.6 Local community

Usually the local community is not directly an actor of the HSC. Anyway, when a disaster occurs the local community is disrupted (Natarajarathinam, Capar and Narayanan, 2009) and the main aim of HSC is to meet the local community's requirements (Thomas and Mizushima, 2005). Therefore, the local community mainly assumes the role of beneficiary in HSC.

Finally, the local community is a key player also because the integration of local people may be essential to guarantee successful performances of a joint disaster response (Martin, Nolte and Vitolo, 2016).

2.2.7 Roles

The roles of the traditional SC are affected by the humanitarian environment. This section analyses the suppliers and customers role. In the HSC context they have some peculiarities:

Suppliers

The supply side of HSC is different from the commercial one because the beneficiary neither purchases nor pays for the delivered service. On the contrary, public or private donors finance the transactions.

Consequently, it is often unknown the behavior of the donors and, as a consequence, the amount of resources available and even the involvement or contribution of suppliers is unpredictable (Tomasini and van Wassenhove, 2009). This is due to the inclusion in the suppliers' category of actors who are very different among each other (private donors, governments, NGO's business companies, media, etc) and because the suppliers' behavior is greatly influenced by the motivation that drives their action (Kovács and Spens, 2007). It could be useful to group them in three major categories: *commercial, humanitarian, commercial and humanitarian*. This classification by Prasanna and Haavisto's (2018) permits to better identify each supplier peculiarities in terms of organizational culture and collaboration.

Costumers

In the humanitarian context, the demand of the customers is not voluntary. Consequently, it cannot be managed and created by the suppliers themselves, but it is the real demand: the time, the place, the quantity cannot be addressed by anyone, the customers have no choice. (Kovács and Spens, 2007). The HSC should just register the needs and meet them in the most timely and efficient way. As a result, the customers are called beneficiaries.

2.3 Type of flows

The HSC, as a general SC, is a network based on three types of flow, as described by Van Wassenhove (2006):

Material flow: it is the flow of physical products from the supplier to the customers including also the reverse flows (recycling, product returns, servicing).

Information flow: it is the flow related to the transmission of information (ordering, tracking, coordinating, material, etc)

Financial flow: it represents credit terms, payment schedules and consignment arrangements

Even if the flows are the same of the private SC, the HSC includes some differences, as described in Altay (2008) paper Figure 2.2.

While in the corporate SC the relation with the shareholders is based only on financial flows, in HSC the donors are the main capital and material providers. In return, they want feedbacks and information about how their donations are spent and the results achieved. The information flow is fundamental: if no feedbacks are sent, the donors may stop their philanthropy.

In addition, the aid agencies have a different relationship with the "*customers*" due to the humanitarian context: the beneficiaries after a disaster are not able to offer a financial reward to remunerate the help received; consequently, no reverse financial flow is expected. They neither provide feedbacks also because generally, the infrastructures are damaged or destabilized and cannot permit an effective and real time communication (Kovács & Spens, 2007).

Finally, also the communication with suppliers is not always clear and the information flow can be interrupted because challenges of different nature can arise.

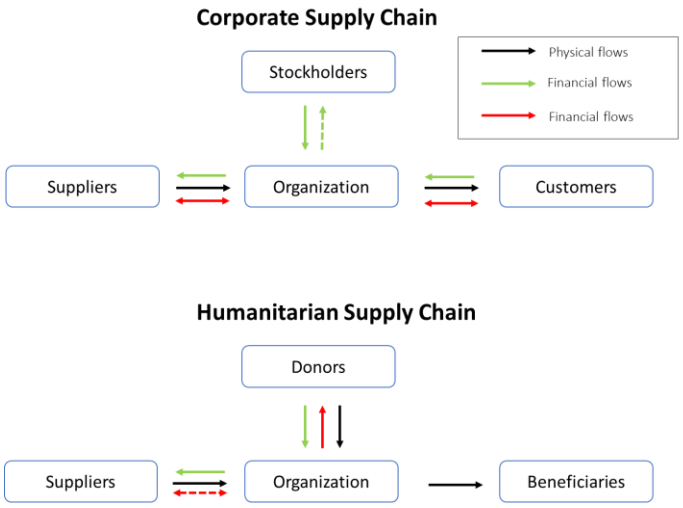

Figure 2.2:Altay (2008): Physical, financial, and information flows in corporate versus humanitarian supply chains. Source: Blanco and Goentzel (2006)

2.4 Disaster phases

HSC deals with disaster management, so it is important to briefly report the main features of this discipline because just only including the stages of a disaster relief can make explicit the unique nature of disaster (Besiou et al., 2011). In addition, distinct phases have markedly differing requirements for HSC design (Kovács and Spens, 2009; Kovács and Spens, 2007); so, a clear description of them it is necessary.

Many authors (Cottrill, 2002 ; Kovács and Spens, 2007 ; Lee and Zbinden, 2003; Altay and Green, 2005; Van Wassenhove, 2006 ; Natarajarathinam, Capar and Narayanan, 2009; Cozzolino, 2012), borrowing the concept of disaster phases from risk management discipline, argue about the best classification of the phases in the humanitarian context. The most common nomenclature includes three main phases: *Preparation* (or preparedness), *Immediate response* and *Recovery* (or reconstruction) in which logisticians and humanitarian actors are typically involved (Cozzolino, 2012).

2.4.1 The preparation phase

This phase is related to the strategies and measures that can reduce the impact of a possible disaster (Mackay, Munoz and Pepper, 2018; Cozzolino, 2012). There are no doubts that "*being better*

prepared leads to a better response" (Van Wassenhove, 2006). The main risk is that without adequate preparation, a system will be unable to return to an acceptable level of performance post-disruption (Sheffi and Rice, 2005). Indeed, as Natarajarathinam, Capar and Narayanan (2009) analyze, the impact of a crisis without a crisis management plan is represented by the bold black line in the Figure 2.3. While, a preparedness and planning strategy could mitigate the consequences for the organizations as the dotted line shows.

Examples of such preparedness measures are: training of the population (Van Wassenhove, 2006) implementation of warning signals (Van Wassenhove, 2006) , pre-planned plans of crisis management (Natarajarathinam, Capar and Narayanan, 2009) , disaster scenario analysis (Kovács and Spens, 2007) or pre-positioning of inventories in strategic locations to increase logistic flexibility (Van Wassenhove, 2006; Mackay, Munoz and Pepper, 2018; Heaslip and Barber, 2014; Long and Wood, 1995; Balcik et at., 2010).

The academic word, in the last years, recognizes the importance of preparedness and deeply studies the best applicable measures (Kovács and Spens, 2007). However, in practice, due to lack of funds (Van Wassenhove, 2006) or because donors want their money to go directly to the beneficiaries and not in back office activities (Murray, 2005), the HOs and the governments often neglect this stage (Chaikin, 2003).

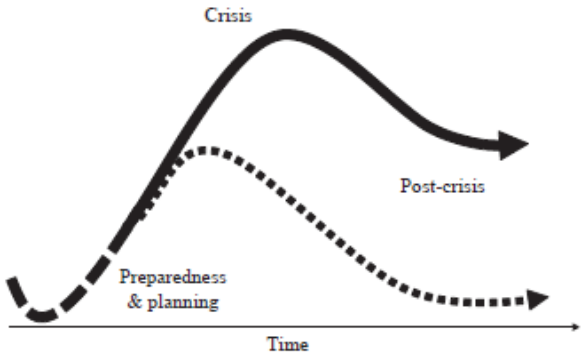

Figure 2.3: Natarajarathinam, Capar and Narayanan (2009): Effects of crisis management

Another important aspect is the uncertainty of the disaster itself: no information regarding the time, location, type of disaster or number of victims are foreseen in advance. So how can an organization be better prepared without these critical data? Van Wassenhove (2006) identifies five key elements to be managed in the preparedness phase to reach an effective disaster management independently from the information available, they are briefly reported.

Operations and process management: logistics plays a central role, so can have big impact. Indeed, the planning and the design of the SC network should be based also on logistics' requirements and constraints and it serves as a bridge between disaster preparedness and response (Thomas, 2003). In general operations and process need to be clearly identified, in order to build a prepared SC that is characterized by lean and efficient strategies: it should be possible to move the resources quickly and to change the suppliers when it is necessary (Mackay et al., 2019).

The selection of adequate human resources: it has a huge impact; training people who can effectively plan, coordinate, act and intervene where and when it is necessary, can change the final result (Pettit and Beresford, 2009).

Financial resources: A sufficient amount of financial resources should be prepared in advance, to start run the operations and guarantee a smoothly rate.

Knowledge: Learning from previous disasters can help the management of the present (Cozzolino, 2012).

Community: Training of local population is essential, if people and local countries can help themselves a first response is possible and lower impact is expected (Lewin et al., 2018). Everybody in the community should know his role in order to be able to deal with a possible crisis (Kovács and Spens, 2007). In addition, it is fundamental the construction of possible collaboration among key players and collaborative platforms (Kovács and Spens, 2007). Stronger is the country, greater is the effectiveness of response as response time could speed up by preparedness training (Lewin et al., 2018).

A main issue can arise at this point: who among the humanitarian organizations can invest time, money and research on activities that will improve the efficiency and effectiveness of the response, but which have no accountable results in a short-term perspective to be shown to the donors? Even if it is estimated that the benefits of investing in preparedness can reduce the cost of future response, there is often a lack of this strategic perspective (Lewin et al., 2018).

2.4.2 The immediate response

This phase starts after the disaster takes place and deals with all the activities needed in the short period after the event (Natarajarathinam, Capar and Narayanan, 2009; Cozzolino, 2012). The speed and effectiveness of these critical hours determine if the relief operation are a failure or a success and it strongly depends on the characteristics of the local response (Altay, 2008; Wassendhove, 2006). All the resources and emergency procedures should be employed according to the plans established in order to preserve life, context, economic or social structure and in general the community affected by the disaster (Altay and Green, 2005; Natarajarathinam, Capar and Narayanan, 2009; Kovács and Spens, 2007). Cozzolino (2012) identifies two sub-phases with two principal objectives:

The immediate response: The aim of this phase is to immediately respond, activating the "*silent network*" (Jahre et al., 2009).

The restore: The objective is to restore the basic services as fast as possible, delivering goods to the highest number of beneficiaries. Time can worsen the magnitude of the event and affect the impact on beneficiaries, so speed is the main driver while cost takes a lower priority (Tomasini and Van Wassenhove, 2009). For this reason, it is necessary an adequate focus on SC management functions (Tomasini and Van Wassenhove, 2009). Often push strategies are put in practice

(Cozzolino et al., 2012; Day et al., 2012) together with the design of a new supply chain with agile, dynamic and flexible characteristics (Altay, 2008).

The idea is to design two SC: one before a disaster occurs (*preparedness stage*) with lean features and one in the *response stage* with an agile strategy. The latter depends on the local infrastructure much more than the former (Altay, 2008; Day et al., 2012; Cozzolino, 2012).

Moreover, the SC should face many challenges: the infrastructures are destabilized (Cassidy, 2003; Murray, 2005) and there is a lack of transport connectivity (Long and Wood, 1995). In addition, as many actors are involved, the collaboration is often inconsistent or inefficient (e.g. competition among HOs, redundancies and duplication of efforts and materials) (Kovács and Spens, 2007; Tomasini and Van Wassenhove, 2009; Cozzolino,2012). In general, the high level of uncertainty and limited resources in every situation make the response phase the most challenging task (Tomasini and Van Wassenhove, 2009).

2.4.3 The Recovery

Recovery deals with crisis on the long run (Altay and Green,2005; Cozzolino,2012). The aim is to support all the involved parties trying to stabilize the community (Altay and Green,2005) and to restore conditions till an acceptable state (Natarajarathinam, Capar and Narayanan, 2009). This future state can be defined like the pre-disaster or a better, new-normal one with higher performances (Day et al., 2012).

The main points of interest are the reconstruction activities of infrastructures or of the economic system (Van Wassenhove, 2006), cost reduction strategies because the perspective is long term such as bring the SC back to a leaner strategy (Tomasini and Van Wassenhove, 2009; Mackay, Munoz and Pepper, 2018; Cozzolino, 2012), measurement of performances (Mackay, Munoz and Pepper,2018) the preparation for future disaster through continuity planning (Kovács and Spens, 2007) and lessons learnt from the event (Thomas, 2003).

Furthermore, Tomasini and Van Wassenhove (2009) believe that the main critical success factor for disaster's recovery is an effective supply chain management. A challenge is related to the nature of the HSC: SC exists for a given period of time and is ending when certain conditions (the desired future state) are met; therefore it is defined "*Transient*"(Day et al., 2012).

Unfortunately, this stage is often neglected or considered a secondary issue (Kovács and Spens, 2007; Day et al., 2012) as the funds are mainly addressed to short-term activities (Gustavsson, 2003). However, without this last step, a community can be destroyed forever, because of many long-term consequences not only for the affected population but also for the management of the companies (Kovács and Spens, 2007; Cozzolino,2012).

2.5 General characteristics

Even if the main elements of different supply chains are common, the HA environment and the nature of the disaster strongly affects and challenges HSC (Altay, 2008; Day et al., 2012). This paragraph aims to lists and briefly describe the main elements which describe and affect HSC.

2.5.1 Uncertainty and dynamism

A first element to be considered is the uncertainty which is inherently linked to the HSC. The reason of this, is that the heart of any humanitarian relief system is the disaster and the nature of a disaster is unpredictable: it is not possible to forecast timing, scale, location and occurrence of them (Balcik et al., 2010; Day et al., 2012; Kovács & Spens, 2007). Furthermore, the factors of the crisis are deeply interactive but the relations among them are not clear so it is not possible to predict the direction in which the crisis may scale (Van Wassenhove, 2006).

Also the environment of the disaster could strengthen the uncertainty factor: the external conditions such as security or politics and the needs are highly dynamic and could be unpredictable (Tomasini & Van Wassenhove, 2009).

In this context, usually it is necessary to implement new supply chains which are different from the one implemented in the past because humanitarian supply chain only exists temporarily. Each time a disaster strikes a new humanitarian effort, new supply chain practices and endeavors are implemented in order to be suitable to answer to the new crisis (Oloruntoba & Gray, 2006).

In addition, it is hard to plan and implement supply chains before the disaster strikes because many necessary information are uncertain: such as the amount, type, and usability of infrastructure (e.g. bridges) and equipment (e.g. material-handling equipment) (Overstreet, Hall, Hanna, & Kelly Rainer, 2011); but also the basic elements of the supply chain such as the demand and the supply capacity which cannot be forecasted (Van Wassenhove, 2006).

Not only the priorities change over time, but also the local conditions are highly dynamic as well. This situation requires different responses, resources and capabilities along the different disaster's phases and according to the dynamic needs (Day et al., 2012; Van Wassenhove, 2006).

To face uncertainty and dynamism humanitarian logisticians have learnt to be very agile, adaptable and capable of setting up and changing supply chains quickly and in difficult conditions aligning the differing needs and dynamic roles of many players (Van Wassenhove, 2006).

In addition, some authors suggest to work during the preparation phase in order to try to mitigate it by implementing *"strategies that shift the impact of such events towards an acceptable level"* (Mackay, Munoz, & Pepper, 2019), even if there is a trade-off between preparation costs and the speed of response when the disaster strikes (Tomasini & Van Wassenhove, 2009). Or to strengthen the information management which can help to reduce the complexity due to uncertainty (Tomasini & Van Wassenhove, 2009). This could be challenging because some information are simply not available or unreliable to the one who may concern and need it (Day et al., 2012). Also

because disasters often occur in developing countries where transportation and communication infrastructures are inadequate (Altay, 2008).

2.5.2 Command and control

Command and control are key aspects in the HSC context. Frequently the relief is challenged by occasional conflicts of authority and delays in decision making, due to distance, communication impediments or misunderstanding (Altay, 2008).

This happens because the actors participating to the disaster relief are not always the same in every disaster, the capabilities of them can change and even if they are the same actors their role within the supply chain probably change (Altay, 2008).

2.5.3 Convergence

One of the main challenges when a disaster strikes is the sudden increment in the supplier and service provider base, both in terms of human capital and of material (Day et al., 2012).

The new groups (suppliers and LSPs) should be incorporated in a structure where they are not traditionally involved: new boundaries should be set in function of their scope and capabilities, they need to be updated of the current performance standards and it is important to determine how these convergence-driven individuals or organizations can provide the greatest assistance. The self-initiated participants often create additional challenges: coordination, communication, and planning efforts are needed and often amplified since they do not participate in any prior planning phase. In addition, if their efforts are not combined, they often disrupt or complicate the efforts of the others. However, they can bring with them new useful relationships, increase the capacity and maybe reduce the conflicts that can arise among the existent organizations such as cultural, religious, gender and race differences (Day, 2012).

Furthermore, individuals and organizations perceive a sudden increase in demand that over-whelms the current supply chain. So, it is usually registered a sudden increase in the supplier base (Day et al., 2012). The material convergence may be supplied by unsolicited donations. The donations are often unrelated to the demand, so they can be unbalanced with respect to the real needs of the people, and this causes resource shortage or oversupply (Balcik et al., 2010).

Consequently, it may arise bottlenecks in the supply chain for the oversupply much-needed resources, including personnel and transportation to sort through and transport the supplies (Van Wassenhove, 2006).

In addition, a lack of standard labelling could worsen the convergence phenomena because it is not clear the content and the priorities of the goods arrived (Kovács & Spens, 2007).

2.5.4 Funding structure

Regarding the convergence, it is necessary to point the attention on the funding. HOs cannot rely on financial returns for their action and their main incomes are the donations. This affects the work

of HOs because the funds could be bounded to specific sets of activities, objectives or time horizons and this narrows the field of action (Moshtari & Gonçalves, 2017).

The time and the amount of funds available could not be easily forecasted; in particular, there is a lack of resources addressed to the activities of the preparedness phase because a great part of the funds flow only after the disaster has occurred (Van Wassenhove, 2006).

In addition, donors ask for high degree of transparency: they want HOs to be accountable for all their funds, to make the money reach the beneficiaries in a fast and efficient way (Altay, 2008). The donors' requirements influence the work of HOs who feel the pressure of time and of the results. However this could lead to paradoxical result: HOs sometimes use funds inefficiently launching simultaneous projects and executing them with large number of personal just to satisfy the donors requirements (Altay, 2008).

2.5.5 Diversity of actors

The size of the disasters usually implies the involvement of many actors who are very different from each other in terms of strategic compatibility, operational compatibility, interorganizational competition, partner's power disparity, and coordination process. This factor could create bureaucratic, communication and collaboration difficulties (Altay, 2008; Day et al., 2012; Moshtari & Gonçalves, 2017).

In addition, HSC incorporates groups who are not traditionally involved in disaster response. To run the interaction among them it is usually necessary "*mutual affective trust"* that is the "*extent to which the supply chain partner believes that the other party is trustworthy or reliable"* (Day et al., 2012). However, this type of trust is generally developed through previous firsthand experience, that is uncommon in HSC (Day et al., 2012).

Even if the actors involved in the HSC share a common goal, the organizations compete, especially in the early stages. As a result, they are reluctant to share information and they compete for the media attention in order to have more visibility and reach more potential donors (Van Wassenhove, 2006).

2.5.6 Human resources

Most people working for humanitarian aid agencies are social activists who are not professional logisticians. On one hand this is a great advantage for HSC because the people involved are strongly motivated and strive to reach the common aims (Heaslip, Sharif, & Althonayan, 2012). On the other hand, this implies shortage of technical knowledge because they are neither professionals nor trained. In particular, the shortage of logisticians impacts notably in the area of assessment and planning (Moshtari & Gonçalves, 2017).

In addition, humanitarian operators work usually in harsh conditions, unsecure situations, and under time pressure because the purpose is *"a matter of life and death"* (Altay, 2008; Day et al.,

2012) so they tend to get stressed and burned out quickly (Altay, 2008; Van Wassenhove, 2006). Fieldwork could help the management of this type of situation. However, the high staff turnover obstacles the creation of a stable knowledge capital that could be exploited in the future disasters (Moshtari & Gonçalves, 2017).

2.5.7 Continuous improvement

Among HOs there is no the culture of continuous improvement and so they are not used to learn from previous experiences (Van Wassenhove, 2006).

Many motivations exist behind: among them there is the high staff turnover (Altay, 2008); HSC management during a disaster is unique and novel each time: in the humanitarian context similar events may require totally different response patterns. In addition, "*disaster relief agencies' knowledge often is only tacit, and because debriefings following a relief operation often are absent or limited in their ability to suggest improvements to relief supply systems"* (Maon, Lindgreen, & Vanhamme, 2009).

Nonetheless, "*it is possible to extrapolate from one particular historic disaster to one in the future"*, but it is necessary to work between the disasters and lead common research (Tatham & Houghton, 2011). This could be hard because it is common a "*we know best*" mentality which regrets the others' approaches. Finally, the lack of improvement is stressed by the lack of funds addressed to HSC (Pettit & Beresford, 2009).

2.5.8 Ethical issues

The aid organizations usually want to create a space of neutrality, transparency and impartiality to work (Van Wassenhove, 2006); however, many elements challenge this space during disaster relief. For example, financial resources are sometimes available in special situations that might be considered a threat to humanitarian principles (Moshtari & Gonçalves, 2017). Or according to some NGOs, the involvement of the military sometimes seems to compromise the principle of neutrality (Heaslip & Barber, 2014); another challenge is the corruption which may affect internally the protection and distribution of relief supplies or, externally, the willingness of donors to contribute (Altay, 2008).

2.6 SC Activities in humanitarian context

The operational characteristics of the relief chains differ depending on the type of disaster and the types of actors involved.

The common aim of these operations is to *"get the right goods, at the right place and distribute to the right people at the right time"* (Van Wassenhove, 2006).

However, it is possible to identify some main HSC activities implemented at the international organization level: procurement, stock pre-positioning, preparedness and design during the pre-disaster phase; and then procurement, transportation inventory, warehousing, distribution and recipient satisfaction in the post-disaster stage (Balcik et al., 2010; Van Wassenhove, 2006).

Among these typical activities, three of them are deeply analysed: procurement, pre-positoning or warehousing, and transportation.

Procurement: The aim is to supply the necessary products. These could be retrieved both locally and/or globally. The choice depends on many factors: the logistics costs, usually lower in the local scenario; the lead time, higher if the goods are far from the destination point; and supply availability, which can be not adequate in terms of quantity or quality for the local one (Balcik et al., 2010).

Competition for local suppliers can inflate the local market (Van Wassenhove, 2006). In addition, sometimes the supplies can be in-kind donations, after the disaster occurs. A point of attention is related to the unsolicited donations that may congest the relief chain (Kovács & Spens, 2007).

Pre-positioning: Instead of waiting passively for a situation of crisis to occur somewhere in the world to launch humanitarian operations, it is possible to mobilize supplies or other material and non-material resources in anticipation. An example is the one illustrated by Chandes & Pache, (2010) who describe the positioning of some common supplies at distribution centers at different intermediary levels. These activities allow to mobilize the different humanitarian supply chain members quickly and to better organize their resources and competences once the disaster strikes (Chandes & Pache, 2010).

Due to high uncertainty, lack of funding and high costs, this strategy is used by few humanitarian organizations. More often, the centres are used temporarily and to support post-disaster relief logistics (e.g. storage at airports or seaports) (Balcik et al., 2010).

Transportation is a key operation, particularly in the post-disaster phase where the "*last mile*" distribution can be very challenging.

Indeed, many factors can create issues for transportation, for example: damaged infrastructure, limited transportation resource, (generally the HOs do not own vehicle fleets and rent locally vehicles and drivers) the geographical characteristics of a region or lack of information about the current road conditions (Balcik et al., 2010; Kovács & Spens, 2007).

A possible representation of a general HSC with the main operations and actors, is well designed by Balcik et al. (2010). They identify the ideal structure of an HSC where pre-positioning is performed and intermediary distribution points are available, often exceptions and peculiarities can change the framework Figure 2.4

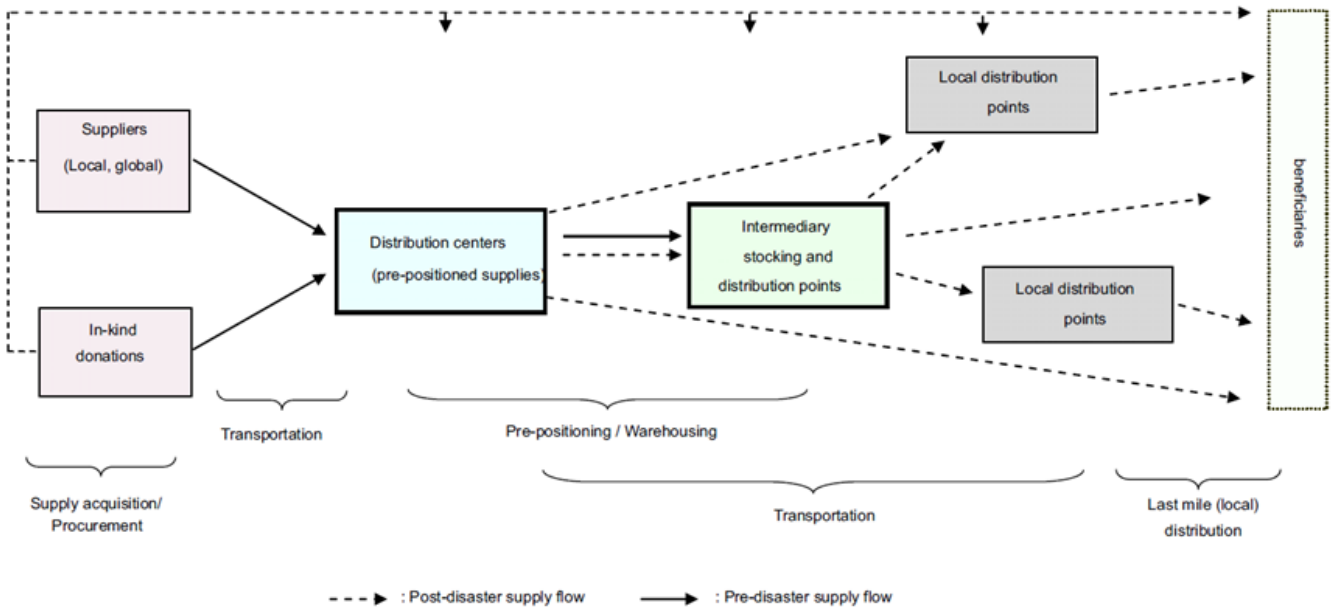

Figure 2.4: Balcik et al. (2010): Humanitarian supply chain structure

2.7 Supply chain strategies

During the the different phases of SC it is possible to apply two main principles of SC leanless and agility (Cozzolino, 2012).

The lean paradigm suggests that *"any activity that does not add value as perceived by the end consumer is waste, and through the removal of waste, value can be added and a superior offer provided"* (Pettit & Beresford, 2009). This concept suites to circumstances where demand is stable and there is low product variety (Christopher, 2000) and it focuses on efficiency and cost saving.

Agility, instead, aims to respond rapidly to changes in customer demand levels and requirements (Booth, 1996). The key concept of agility are flexibility, additional capacity and adaptability. For this reason, an agile supply chain is less cost effective than a lean one, but it has better customer service levels able to meet the demands of consumers when they change (Van Wassenhove, 2006).

The humanitarian context is characterized by uncertainty (in both demand and supply), continuous changes of needs, dynamic roles of many players and unpredictability of disaster (time and location), and it requires an agile approach which allows to the SC to change quickly and shape a suitable structure (Van Wassenhove, 2006).

The lean principle, however, suits to the restoring and reconstruction phase (Thirdly, the phases of the disaster are identified studying also their impact on the HSC: the preparation before the disaster strikes can lead to a better response but it is often neglected because it implies capital to be invested that is not present before the disaster strikes. The HSC implemented should be lean. Secondly,) because it permits to save as many costs as possible (Cozzolino, 2012).

Oloruntoba & Gray (2006) propose the combination of these principles within the same supply chain: the result is an hybrid supply chain that combines a lean and efficient supply upstream and an agile and effective supply downstream (Figure 2.5).

At the international level, during the preparedness phase, should be lean and efficient: the procurement, the needs forecasting, the planning, the transportation towards distribution centers should be characterized by cost reduction and efficacy. The lean part should keep on with demand rate that are stable and predictable, allowing for a sustainable long-term HSC.
Meanwhile, when disaster occurs the supply chain should be adequate to respond to real demand, adapting its design (for example providing additional capacity that can meet the changing requirements or minimising the amount of inventory within the SC).

An hybrid solution needs to mix these concepts, aiming at both the objectives. An example is the usage of postponement strategy: generic inventories are warehoused by suppliers, allowing cost reduction for economies of scale, and then customized according to the evolving needs of end users (Oloruntoba & Gray, 2006).

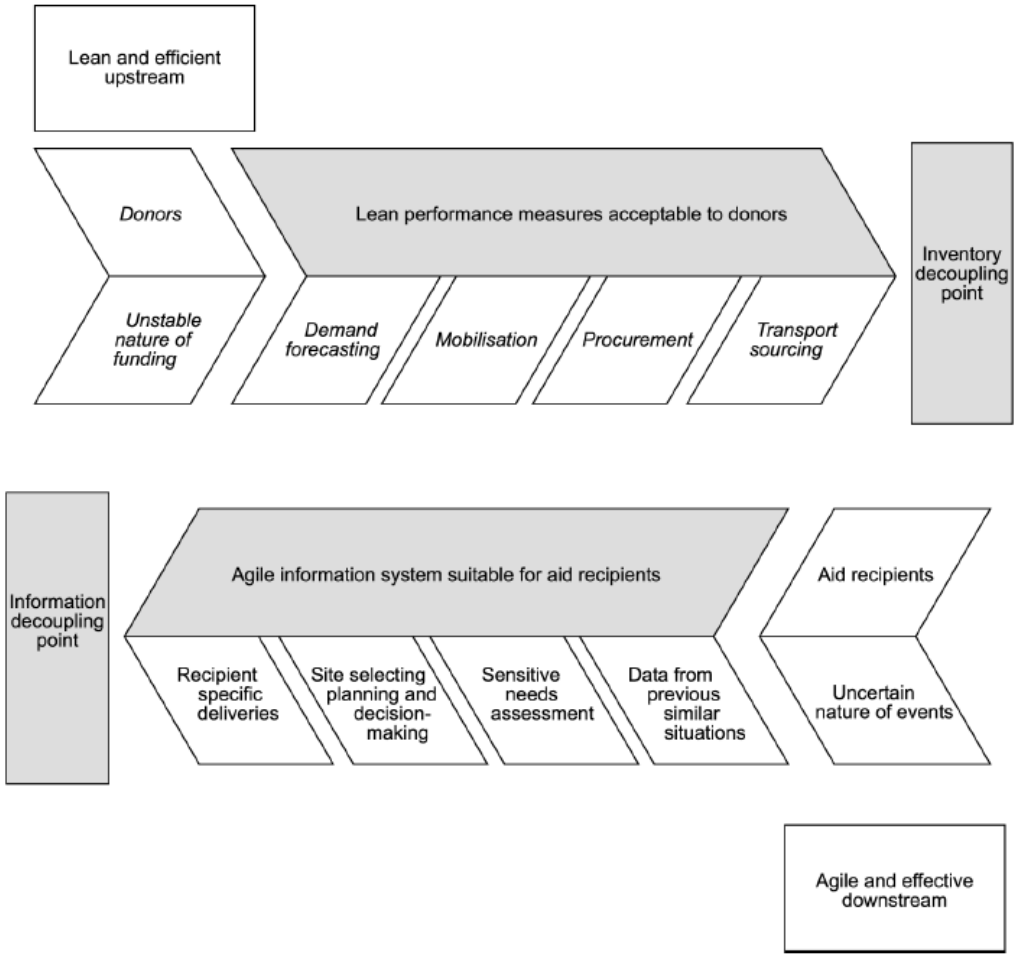

Figure 2.5:An agile supply chain for humanitarian aid (Oloruntoba & Gray, 2006)

3. Research design

3.1. Research approach

This research tries to answer to the three wide research questions that are reported in the Introduction through a precise research strategy. This chapter describes this research strategy and refers to other research approaches with reference to the research onion of Saunders et alt., (2015).

Inductive approach

First of all, the thesis approach is mainly **inductive**.

Saunders et alt., (2016) identify two main approaches for theory development: deductive and inductive. In particular, when the starting point for the research is theory, and the research strategy is used to test the theory, the authors define it a more deductive approach. While, if the data are collected to explore a phenomenon and then theory is generated or built, the approach is inductive. In this last case, from the specific it is generated the general by making observations, finding related patterns, creating outcomes and trying to search the validity of those outcomes[13].

The choice of an inductive approach is explained by some reasons:

Firstly, this approach is likely to be particularly concerned with the context in which the events investigated take place (Saunders et alt., 2016). The humanitarian field, indeed, as highlighted in the chapter HSC: Background and challenges, is a peculiar and unique environment.

Secondly, the humanitarian academic research focused on collaboration is not very developed and mature (Nurmala et al., 2017; Nurmala et al., 2018): so, it seems to be more valuable generate and build new theories (inductive) instead of falsifying or verifying the existing ones (deductive).

Thirdly, this approach fits better to explore all the relations, meanings and insights related to the collaboration topic to answer the research questions.

In addition, the inductive approach permits to generalize from the specific, and this well fits with the case study approach.

Explorative research

Secondly, it is important to underline that the aim of the research is to explore the collaboration topic, trying to discover what is happening and gaining insights about this specific topic (Saunders et alt., 2016). The purpose is explorative because the research question covers a broad spectrum, it is not related just to specifics elements of collaboration and their causal relationships that exist between variables, as an explanatory study is.

[13] *Hinkelmann, K. & Witschel, H. F: "How to choose a research methodology?". From the website http://knut.hinkelmann.ch/lectures/project*

This approach leads the entire research project, both the literature review project and the research strategy.

A case study strategy

These two aspects of research and some other pragmatic concerns lead the choice of research strategy: a **case-study strategy**.

The case study is an in-depth inquiry into a topic or phenomenon within its real-life setting (Yin 2014). It is useful to generate insights from intensive and in-depth research into the study of a phenomenon in its real-life context, leading to rich, empirical descriptions and the development of theory (Dubois and Gadde 2002; Eisenhardt 1989; Eisenhardt and Graebner 2007; Ridder et al. 2014; Yin 2014). The main idea is that through this strategy it is easy to understand the relation between a phenomenon and its context (Dubois and Gadde 2002). This aspect seems particularly relevant in this case because the data collected are strongly context-specific: they belong to different type of companies (NGOs, private), different managerial levels (CEO, operative operators, mangers of BUs), different location and disasters, different disaster phases (preparedness, recovery, response).

This in-depth analysis permits to integrate these sources to describe the HSC, the reasons of its configuration, and maybe to understand the effects of the situation and implications for action. In addition, the inductive approach enables to identify themes and patterns in these data, trying to locate them in the existing literature in order to refine, extend or generate theory (Ridder et al. 2014).

The case-study approach is commonly used in the HSC context (Vega, 2018), however, usually these cases lack of rigor. For this reason, a framework has been developed for structure the case study rationale and analysis. In the chapter 3.3 Research methodology are provided specifications about the purpose, the unit of analysis, and data collection techniques implemented.

Finally, the research is **multiple cases**: more than one case is collected and analyzed. This approach enables to find out results that could be common to different cases. The research questions reveal the intention to discover results that are independent from the single cases.

3.2 Research Method

A qualitative research

To perform the case-study strategy some methods and techniques are used for the data collection.

An important aspect is the research design choice: it is a mono-method technique, a completely **qualitative data** collection through a single technique (interviews). The reasons of this choice are many.

Firstly, it is clear that quantitative data could not capture all the relations, meanings and insights related to the collaboration topic to address the research questions. Their nature is intrinsically

qualitative and even if some authors try to analyze it in a more quantitative way, it is more valuable to exploit the subjective and socially constructed meanings expressed by those who take part in the collaboration phenomenon.

Secondly, non-numerical data are the more common type of data generated by interview (Saunders et alt., 2016).

And thirdly, qualitative data are likely to be characterized by richness and fullness, because they allow to explore a subject in a manner as realistic as possible (Saunders et alt., 2016).

However, a challenge that should be considered is that the content is derived from words which may have multiple meanings or unclear meanings: they are non-standardized data that require classification into categories and interaction between data collection and analysis (Saunders et alt., 2016).

Systematic review methodology

A qualitative research implies a preliminary step before data collection: a critical review of the literature which represents the foundation on which the research is built. In particular, this review is focused on the research question's topic: the cross-sector collaboration in the HSC context.

Indeed, in order to increase the significance of research's analysis and results and to show a deep understanding of the field and its key theories, concepts and ideas, as well as the major issues and debates, it is essential a relation to other people's research and their findings (Saunders et alt., 2016; Denyer and Tranfield 2009). It is important not just to demonstrate awareness of the current state of knowledge in the HSC collaboration subject, but to critically identify its contributions, limitations, knowledge gaps to be filled and develop the existing body of further (Seuring & Gold, 2012).

There are many alternatives available about the methodologies for critical review of the HSC collaboration; in this project the **Systematic Review methodology** is the chosen one.

The reasons of this choice are different: firstly, from the chapter 2.HSC: Background and challenges, it emerges that the research in this field includes sources and authors who have completely different backgrounds and aims; therefore, it could be difficult to compare and aggregate the existing knowledge to have a whole picture of the state of art in the field (Durach et al., 2017).

In addition, SCM knowledge (and HSC can be included in this category) is shaped by prior knowledge of the external reality, and it is subjected to the language used to express the know-how and to imperfect observations (Durach et al., 2017).

Consequently, a systematic approach seems the most suitable, in order to create a rigorous, transparent knowledge (Durach et al.,2017). This approach is "*a systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents"* (Fink, 2005); in other words it is a comprehensive pre-planned strategy for locating, critically appraising, analyzing and synthesizing existing research (Saunders et alt., 2016).

More details about the process and key steps are available in the chapter 4.1 Literature search methodology.

Semi- structured interviews

To collect information on each case of study, two types of data are collected: primary and secondary.

Semi-structured interviews are conducted to collect the main primary data.

This method is selected among many others (interviews, discussions, observations and questionnaires) because interviews are generally used to gather valid and reliable data that are relevant for the research question, and they are particularly suitable for qualitative design (Saunders et alt., 2016).

However, there are different types of interviews: structured, semi-structured, unstructured or in-depth interviews. The semi-structured interview has been selected for two reasons.

Firstly, because of the nature of the data: they are completely qualitative, extremely dependent from the context and so not suitable for structured interviews.

Secondly, because it allows to maintain a certain level of formality and focus: in the literature review some typical dimensions of the collaboration are identified (as described in the 4.3 Definition of the SLR framework) and the semi-structured interview maintains a structure related to these dimensions (this structure is detailed in the chapter 5.1 Data collection).

Consequently, semi-structured interviews seem the right choice because they are a good trade-off because they are not standardized, but a structure exists: there is a list of key questions that may vary from one interview to another.

In addition, more practical motivations justify the choice of this technique: as Bernard (1988) claims, semi-structured approach is best-suited when interviewer has only one-time opportunity to make the interview with someone, which represents exactly a constraint of this research project.

Furthermore, the humanitarian context is characterized by general distrust of other types of data collection techniques and by a lack of understanding of modern operations research and coordination concepts, particularly, in developing countries (often target of this project's interviews) (Mehta et al., 2003; Akhtar, 2009).

A brief list of questions is available in the paragraph 5.1.1 Semi-structured interview protocol.

Finally, other primary data are collected from reports and documents directly published or provided by the interviewee's organization (the list of these data is available in chapter5.1.2 Primary documents and reports) and additional secondary sources are analysed from articles, journals, national authorities, books or academic material (the list of these data is available in the5.1.3 Secondary sources).

All these different data are then triangulated with the semi-structured interviews to obtain a complete picture about the case studies.

Analysis techniques

The analysis of data is performed using the thematic narrative techniques to focus on the content of the qualitative data, of the narrative. Indeed, the objective is to identify themes across different narratives (the interviews transcription and the data from other sources). Especially a color-code analytical themes is performed for each interview and secondary data; the themes corresponds to the 17 dimensions of the *findings framework* (described in detail in chapter5.1 Data collection). This type of technique seems the most appropriate in this type of research because the interviewee's experience can be maintained, the chronological sequence and contextual background are preserved and finally the emphasis (compared to other type of analysis) is more on '*what'* the narrative is about rather than '*how'* about how it is constructed (Saunders et alt., 2016).

3.3 Research methodology

The following Figure 3.1 shows briefly the processes followed for the entire research. For each step an explanation or comment is available.

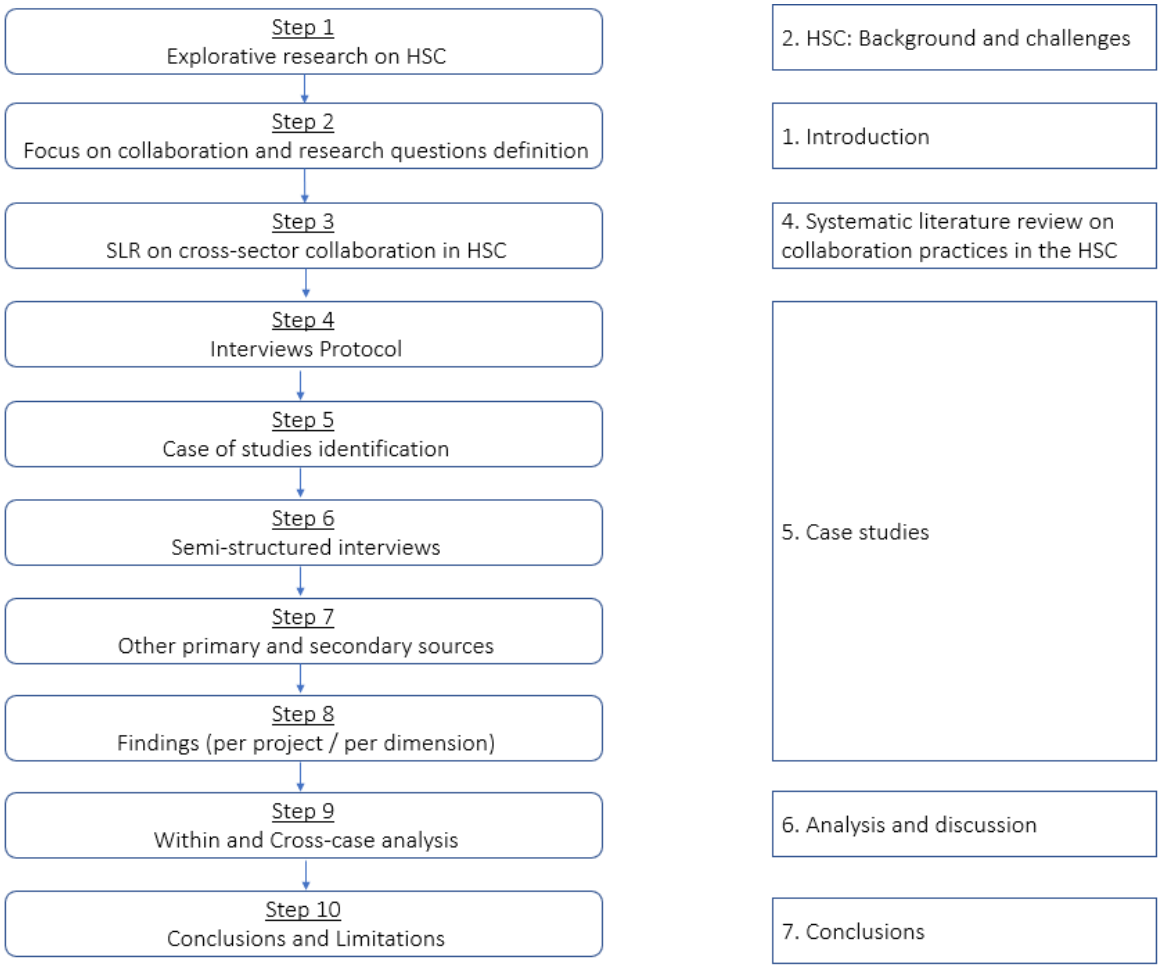

Figure 3.1: Steps of the research methodology

First and second step:

In the first step an explorative research about the HSC is performed because this specific field is characterized by singular features. From this research it emerges that one of the main challenges is the collaboration inside the HSC. This theoretical knowledge and practitioners' opinions allows the detection of a first draft of the research question (see chapter Introductionfor) :

RQ1: "Which are the main elements of cross-sector collaboration in Humanitarian Supply Chain?"

RQ2: "Which elements, among the cross-sector collaboration ones, can be considered collaboration critical factors (CCF)?"

RQ3: "Among the collaboration elements, which are the more recurrent and relevant patterns?"

Third step:

As described in chapter Systematic literature review on collaboration practices in the HSC a systematic literature review on the cross-sector collaboration in the HSC is performed. The aim is to revise critically the state of the art on this topic, following precise procedures (4.1 Literature search methodology) and collecting the data based on twenty-four dimensions (which constitutes the so-called *SLR framework*) that are better defined later (4.3 Definition of the SLR framework). In particular, 40 papers are analyzed and the gaps in the literature are identified and commented.

Fourth step:

The identification of the theoretical gaps allows to draft the protocol for the interview trying to cover the gaps discovered in the literature and to investigate the case studies to answer to the research questions. Details on the protocol and questions are available in the 5.1.1 Semi-structured interview protocol.

Fifth step:

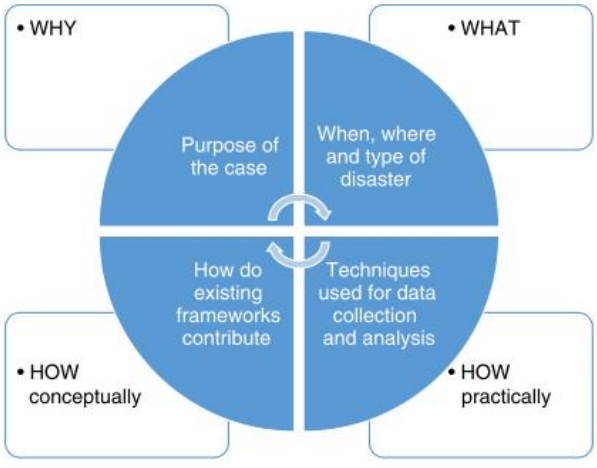

Figure 3.2:Crafting case study research in Humanitarian Supply Chain

Successively the case studies are identified. The framework of Vega,(2018) is the ratio to identify the most suitable ones. In particular, as it is showed in the figure above (Figure 3.2) four main elements need to be specified:

1. The why: the purpose of the case-study is explorative. They are real-life examples through which collaboration is examined and patterns, linkages, challenges emerge from the analysis. The cases are sources of inspiration for new ideas, and this is particularly common in inductive approach (Vega, 2018).

2. The what: the unit of analysis of each case study is a collaboration's project within an organization: how the collaboration is structured within a specific project. Indeed, inside an organization many projects or programs exist, especially in the case of INGOs, and each of them have different aims, characteristics and actors. It is selected as unit of analysis the collaboration project and not the organization in order to obtain more context-specific data and to include all the elements and relations that exists within a collaboration. The collaboration projects are supply chain projects in the field of humanitarian aid, they can be related to all the different phases, without any specific restriction on the disaster type (both natural, man-made), the location extent is the country or regional level but in developing countries. There is an important inclusion criterion: they should be cross-sector collaborative projects. As a result, the definition of reference for what is a cross-sector collaboration is "*set of activities that involve collaboration between organizations that are based in three sectors: the state (government), the market (business) and civil society (such as NGOs or non-profits)*" (Waddell and Brown 1997)

3. The how practically: it is not possible to retrieve data directly from the site, but more retrospective studies may be performed. Historical data (from reports, journals …) are complementary to the experience feedbacks retrieve through the semi-structured interviews. To choose the sample a criterion technique is used[14]: only case studies that involved cross-sector collaboration are included. However, the time available for the research is limited, consequently critical case sampling is also implemented.

4. The how conceptually: from the SLR no integrated theoretical frameworks about all the dimensions considered is emerged. For this reason, no direct relation with specific theoretical frameworks is performed. However, in the Analysis and discussion chapter the results will be linked to the existing literature.

Sixth step:

The research is based on evidences collected from 7 case studies, and as first step semi-structured interviews are performed in a single round. In particular, 6 interviews are made but in two cases the respondents report about two different projects. One interview is face to face while the others

[14] *Cohen D, Crabtree B. "Qualitative Research Guidelines Project." July 2006. http://www.qualres.org/HomeCrit-3805.html access on the internet on 12/1/2020*

on skype-call. For the Case A two interviews with two different actors of the same project are reported and integrated.

A short version of the interview's protocol has been sent to the respondents before the interviews. The interviews lasted on average one hour and quarter and they are led by three interviewers.

The Table 3.1underlines each case study code, case study name, the case study location, the organization interviewed (only in case A more than one organization has been interviewed about each case study), the respondent code and its role in the related organization, and finally the main other sources (both primary and secondary).

Case code	Case study Name	Case study Location	Organisations interviewed	Respondent code – role	Other sources
A	Malaria treatment SC	Zambia	1.INGO 2.No-profit organisation	R1 – CEO of INGO R2 – PM of INGO R3 – CEO of No-profit	Actors websites; Project reports; Manuals; Newspapers articles
B	Emergency distribution SC	Madagascar	INGO	R1 – CEO R2 – PM	Actors websites; Project reports; Actors news
C	Food rations SC	Syria	UN agency	R1 – Logistic Assistance	Actors websites; Annual country reports; Project reports;
D	Cash based assistance SC	Syria	UN agency	R1 – Logistic Assistance	Actors websites; Annual country reports; Project reports; Papers
E	Survival kits pre-positioning	Kenya	Private company	R1 – Operation manager	Actors websites
F	Hurricane Dorian response SC	Bahamas	Private company	R1 – CEO	Actors websites; Actors news; Newspapers articles
G	Yemen medical distribution to IDPs	Yemen	INGO	R1 - Head of logistics	Actors websites; Newspapers articles

Table 3.1:Synthesis cases information

Seventh step:

After the identification of the projects, to complete the case studies, more information is retrieved from other primary or secondary sources. The list of this information is specified in the paragraph 5.1.2 Primary documents and reports and 5.1.3 Secondary sources.

The data are then combined with the interviews, however if there are conflicts between the sources the information from the semi-structured interview are considered as the most reliable.

Eighth step:

The data collected are reported in a *findings framework* in order to permit systematic collection and later, a cross-case analysis. The findings framework is built based on the protocol of the interview. It consists of an Excel sheet: each row refers to a case study and the columns to the collaboration dimensions investigated. The framework is different from the SLR framework: *risks*, *scope* and the *disasters dimensions* are not included. Reasons for the exclusions of this variables and additional details on the framework structure are available in the paragraph 5.2 Findings and in the Appendix 4: Sample findings framework.

In the findings chapter, the unit of analysis is the case study that is the collaboration project (the two words are used as synonymous in the thesis) and information is reported separately according to the 17 dimensions of the framework.

Ninth step:

The analysis of the data is performed using the thematic narrative techniques, with a color-code analytical themes approach where the themes corresponds to the 17 dimensions of the *findings framework*.

Two type of analysis are performed in this research: a within and a cross-case analysis.

The first tries to answer to the research question *RQ2:* "*Which elements, among the cross-sector collaboration ones, can be considered collaboration critical factors (CCF)?".* The aim is to identify for each single case study one or more CCF, keeping a relation with the specific context. However, the CCFs are researched among the collaboration dimensions for which more data are available. More details on the structure of the within-analysis are available in the relative paragraph 6.1 Within-case Analysis:.

While the cross-case analysis tries to answer to the RQ3*"Among the collaboration elements, which are the more recurrent and relevant patterns?".* The analysis aims to explore deeply the elements of the cross-sector collaboration, trying to identify if there are some patterns and possible relations among the elements which could explain the configuration of the elements across the cases. In order to identify the more relevant patterns, it is not possible to compare all the elements of the collaboration, so the patterns are identified only among the CCF's elements. In conclusion, this cross-case analysis permits to identify some relevant insights but also some suggestions about four CCFs: the presence of the private sector, government, central coordinator and agreements.

Tenth step:

The last step of the analysis summarizes the contribution of the thesis to the potential stakeholders of this research: it identifies the practical implications the results obtained could give to the work on the field of the practitioners and it describes the contribution the research could give to the academic world.

Furthermore, it specifies the boundaries of the validity of the results and the limitations of the research process. Finally, starting from a reflection about potentiality of the direction set in the research and of the limits of this work, future development of the thesis are identified and described.

4. Systematic literature review on collaboration practices in the HSC

In the next section is described in detail the systematic review study of the literature about the collaboration practices in the field of the HSC. This study is necessary for the research project to develop an adequate knowledge of the field and give a significant contribution to the research in this specific field. In particular, the chapter is organized as follow: in the chapter 4.1 Literature search methodology it is described in detail the methodology to select and analyze the literature sample; this sample is briefly described in the 4.2 Descriptive statistics chapter; then the content of the sample are reported, in particular in the chapter 4.3 Definition of the SLR framework it is reported a description of the structure of the framework to collect the findings of the literature and in the 4.4 Findings on literature review the content are reported in synthesis and in detail. Finally, the last part (4.5 Discussion on literature review) is dedicated to a discussion about the content of the literature and to the identification of the gaps.

4.1 Literature search methodology

As highlighted in the 3.2 Research Method chapter, the technique used to perform the critical literature review on the cross-sector collaboration in the HSC is a Systematic approach.

In particular, the systematic literature review process follows precise guidelines; in this research a first source of inspiration is the new paradigm of Durach et al., (2017). Indeed, they try to deeply define six steps that can reflect the idiosyncrasies of SCM research. This method could be applied also in the HSC context; however, in this work the different steps are overlapped in some points.

The quoted six steps are:

1. Defining the research question of the systematic literature review
2. Determining the required characteristics of primary studies
3. Retrieving a sample of potentially relevant literature
4. Selecting the pertinent literature
5. Synthesizing the literature
6. Reporting the results

The **first step** identified by Durach et al. (2017) aims to *"create the theoretical lens to study the phenomenon of interest"* and *"to identify in a detailed way the purpose"* of the SLR. In the thesis the main aim is the review of studies about the cross-sector collaboration in the HSC context.

The theoretical lens, at the beginning, consist of an initial *SLR framework* regarding the phenomenon under study which specifies the boundaries, defines the unit of analysis selected and reflects the relations with the concepts of the phenomenon (Durach et al., 2017). This initial framework is composed by twenty-four dimensions (6 related to the disaster typology and 18 related to the collaboration) that are descriptive of collaboration in the humanitarian context and

the related disaster features. The dimensions have been derived mixing two different fields: the studies on the humanitarian supply chain and the studies on collaboration in the supply chain. Take inspiration from the mature SC collaboration research field seems to be important to set the work in the humanitarian context.

Before starting the review, a quick review of the sample papers double checked the need to include all the twenty-four dimensions. Obviously, lesson learnt, recommendations of the authors, methodology and personal notes have been collected for each paper revised.

The main objective of the next phases (2, 3, 4) is to identify the primary studies and then select the "*baseline sample*" of potentially relevant literature which covers the different aspects identified in the initial framework.

Especially, in the **second step** the primary studies characteristics are selected by developing inclusion and exclusion criteria.

This selection consists of three successive phases to identify a relevant sample of studies to reach a number of relevant papers adequate to the time constraints of this research.

In the first phase the studies are selected according to these criteria:

Exclusion criteria:

- Studies published in language other than English
- Studies which miss important detail data the author, the title, the year, the abstract
- The documents type excluded are *book, book chapter, conference review, conference paper, report, note, letter* (because the priority is to the most synthetic and independent format)
- The papers written before 1990, under the assumption that they are outdated and that their contributions are integrated and included in the more recent ones

Inclusion criteria**:**

- Both qualitative and quantitative studies
- Conceptual and empirical studies

In the second phase the studies are selected according to these criteria:

Inclusion criteria:

- The studies published on selected journals that are available in the Table 3.1

Annals of Operations Research
Disasters
European Journal of Operational Research

International Journal of Physical Distribution and Logistics Management
International Journal of Production Economics
International Journal of Production Research
International Journal of Supply Chain Management
Journal of Business Logistics
Journal of Cleaner Production
Journal of Contingencies and Crisis Management
Journal of Emergency Management
Journal of Humanitarian Logistics and Supply Chain Management
Natural Hazards
Production Planning and Control
Public Administration

Table 4.1: Table of the selected journals

In the third phase the studies are selected according to these criteria:

Exclusion criteria:

- The studies which are related to the research questions excluding the ones that just mention the collaboration in the HSC
- The papers focused on IT and technology's tools
- Papers whose core is modelling and simulation
- Studies missing full text

Inclusions criteria:

- Scope: papers focused on the cross-sector collaboration in HSC and disaster relief contexts

In the **third step** it is performed the collection of the potentially relevant literature which covers the different aspects identified in the initial framework. In order to do this, search procedures and keywords are selected. This research is performed on *Scopus* since it is one of the most complete and high-quality electronic literature databases.

To what concerns the *keywords*, the narrative literature research about HSC in general enables to identify which keywords are commonly selected to address the topics investigated in that context. In particular, the aim of the keywords selection is to include as many relevant studies as possible and to limit the studies to the one concerning the collaboration in the humanitarian sector. For these reasons, it is identified two clusters of words: the first limits the studies to the one concerning HSC and disaster relief context and the second to the one related to collaboration. The keywords of the first group are: "*relief chains*", "*Humanitarian supply chain*", "*humanitarian operations*", "*humanitarian logistics*", "*disaster management*", "*crisis management*", "*disaster relief*", "*emergency management*"; the ones of the second group are: "*Cross sector collaboration*", "*Coordination*", "*Partnership*", "*Collaboration*", "*Private Sector*". Then, the words of the two clusters are combined using the Boolean operator "*AND*" to create all the possible research combinations.

The Table 4.2 summarizes the result of this process. In total 40 combinations have been created.

Keyword 1		Keyword 2	Number of papers retrieved
Cross sector collaboration	AND	relief chains	6
Cross sector collaboration	AND	Humanitarian supply chain	5
Cross sector collaboration	AND	humanitarian operations	4
Cross sector collaboration	AND	humanitarian logistics	4
Cross sector collaboration	AND	"disaster management"	9
Cross sector collaboration	AND	"crisis management"	9
Cross sector collaboration	AND	"disaster relief"	4
Cross sector collaboration	AND	"emergency management"	13
Coordination	AND	"relief chains"	15
Coordination	AND	"Humanitarian supply chain"	30
Coordination	AND	"humanitarian operations"	37
Coordination	AND	"humanitarian logistics"	70
Coordination	AND	"disaster management"	650
Coordination	AND	"crisis management"	335
Coordination	AND	"disaster relief"	270
Coordination	AND	"emergency management"	519
"Partnership"	AND	relief chains	23
"Partnership"	AND	"Humanitarian supply chain"	8
"Partnership"	AND	"humanitarian operations"	8
"Partnership"	AND	"humanitarian logistics"	21
"Partnership"	AND	"disaster management"	215
"Partnership"	AND	"crisis management"	127
"Partnership"	AND	"disaster relief"	92
"Partnership"	AND	"emergency management"	199
"Collaboration"	AND	"relief chain"	6
"Collaboration"	AND	"Humanitarian supply chain"	29
"Collaboration"	AND	"humanitarian operations"	22
"Collaboration"	AND	"humanitarian logistics"	40
"Collaboration"	AND	"disaster management"	532
"Collaboration"	AND	"crisis management"	355
"Collaboration"	AND	"disaster relief"	145
"Collaboration"	AND	"emergency management"	488
"private sector"	AND	relief chains	13
"private sector"	AND	"Humanitarian supply chain"	7
"private sector"	AND	"humanitarian operations"	4
"private sector"	AND	"humanitarian logistics"	13
"private sector"	AND	"disaster management"	156
"private sector"	AND	"crisis management"	72

"private sector"	AND	"disaster relief"	46
"private sector"	AND	"emergency management"	96

Table 4.2: keywords combinations

Scopus identifies all papers containing both the words as keywords or as part of the title or included in the abstract. The table shows that some words are inserted without quotation marks. This because those combination of words could be retrieved not exactly in that order.

The studies retrieved thanks to the *Scopus* research are 4697 with duplications by applying the 40 keywords strings.

The **fourth step** aims to assess the potentially most relevant papers among them (the "*synthesis sample*"); indeed, the inclusions and exclusions criteria described above are applied mainly in three iterative stages, as depicted in the Figure 4.1:Literature review sample selection stages.

Firstly, the duplicated papers are excluded (1271), then theoretically the non-English studies should be excluded but all the studies are English based, in addition looking at the document type 1351 papers are eliminated together with the ones without important detail like author or abstract (24) and finally the time horizon criteria takes out 24 works. So, a first screening of title and abstract is performed on 2027 papers. However, the large sample includes many studies that are completely out of scope and some with a low quality. For this reason, some journals are selected: they represent authoritative sources in the field of disaster management, operational research and supply chain, and they can be considered providers of established knowledge and with a higher probability of having a significant impact on the field (Vega, 2015). Applying this inclusion criteria, the resulted sample consists of 239 papers for which the title and abstract are analyzed. Mainly 197 can be classified out of scope: some are not related to HSC, some do not focus on collaboration and some are too specific on IT, technologies implementation or on quantitative and optimization models. The third sample is composed of 42 papers, however 2 of them are excluded as the full text is not available. Consequently, the synthesis sample is made by 40 papers for which the full text is analyzed as core basis of the literature review. The complete sample is available in the Appendix 2: SLR paper sample.

In the **fifth step** the relevant literature is studied and coded according to the framework defined in first step to extract pertinent information. However, comparing the differences between the studies and their contents, as it often happens, new lights on the initial framework can be shed (Durach et al.,2017). Indeed, small changes in the identification of the information collected about the dimensions are necessary: for example, more precise definitions (as the ones for the type, the roles taken by the actors or the mechanisms) or more descriptive names (like institutionalization dimension that before was formalization or the enabler ones that is called drivers implicitly including just necessary conditions). For this reason, it is draft and filled a second reference framework. It is the one described in the paragraph 4.3 Definition of the SLR framework, while the initial framework is not reported. The reason of this choice is that the changes are just related to not relevant aspects (definitions or names) and seem not necessary to detail them, however practically the two stages are carefully performed.

In the **sixth step**, the whole picture of the collaboration in the humanitarian supply chain emerged from the codification performed using the second framework; it is summarized and reported the through most appropriate tool: *descriptive findings* (Durach et al.,2017), with a detailed description of each dimensions of the *SLR framework* (4.4 Findings on literature review) .

Finally, it can be pointed out that one of the potential biases for the SLR process is the so-called *selector bias*. It is defined as the subjectivity which brings the author's perceptions regarding results, authors or journals in the selection of the primary studies (Durach et al.,2017). Especially, it can be relevant when the exclusion of the "*out-of-scope*" papers is performed because the approach is a qualitative one and it is based on the author opinion. In this research, this risk emerged during the third selection phase, however, as highlighted by some scholars (Durach et al.,2017), the presence of multiple independent coders can reduce this bias: this research benefits the independent classification of two researchers who develop separately the exclusion choices and then agree about the final and definitive selection.

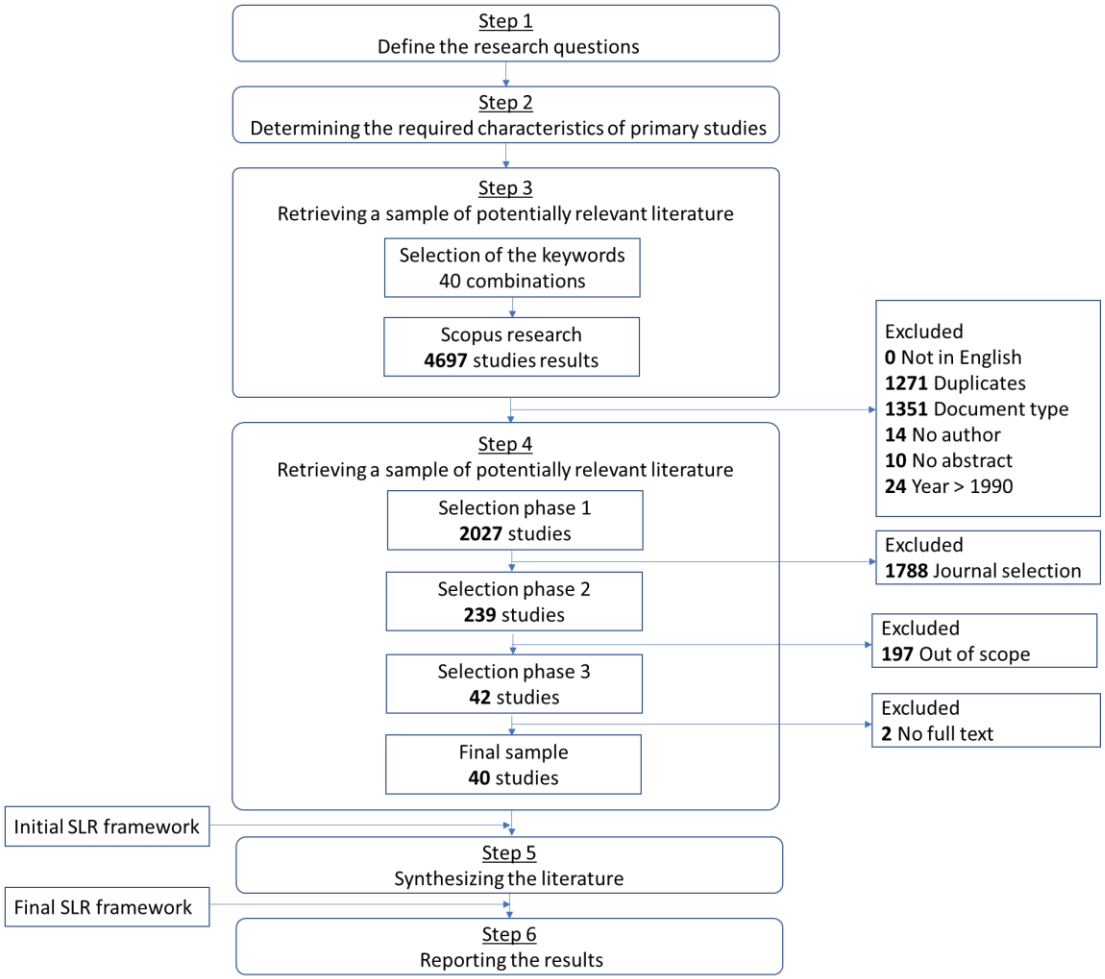

Figure 4.1:Literature review sample selection stages

4.2 Descriptive statistics

This section is dedicated to a descriptive analysis of the 40 papers selected of the systematic literature review (see Appendix 4: Sample findings framework). The aim is to explore the sample in order to have a general idea about the distribution of the publications along the time, the journals which have published the papers and the relevance of each paper within the sample.

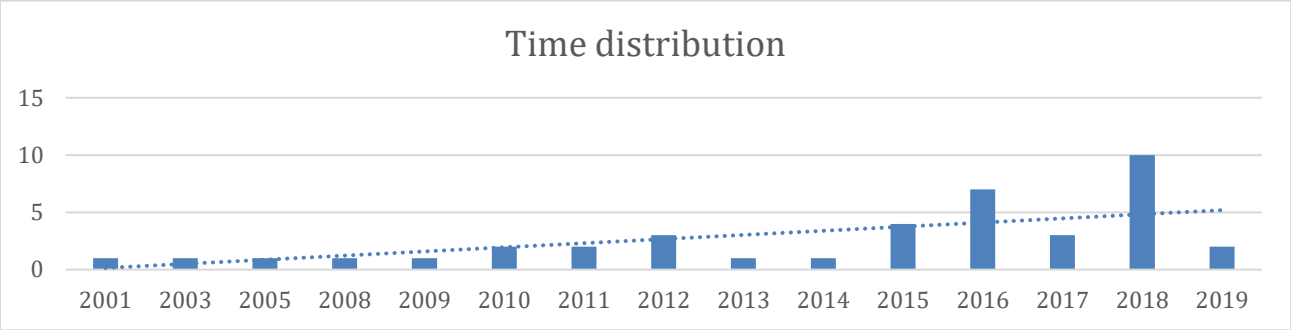

Figure 4.2: Time distribution of the sample of papers

The Figure 4.2: Time distribution of the sample of papersFigure 4.2 represents how many papers of the sample are published each year.
The papers are equally distributed over the time (from 1 to 3 papers per year) until 2015 but the concentration of the publications increases in recent years: the number of papers considered published each year is higher between 2015 and 2018 (from 3 to 10 per year). The 2019 can be considered an exception, the reason can be that the selection of the papers is performed before the end of 2019.

This incremental trend in the number of publications can reflect a general increment in the publications about collaboration in HSC in the research field. This trend maybe is caused by some significant events in the field; for example, in 2010 more than 200 organizations participate at Haiti earthquake response; this large-scale event highlights the need of coordination systems within the humanitarian and ways of working; similarly the necessity of more efficient collaboration emerges in Nepal 2015 earthquake when the number of actors challenges the coordination efforts (Lewin et al., 2018).

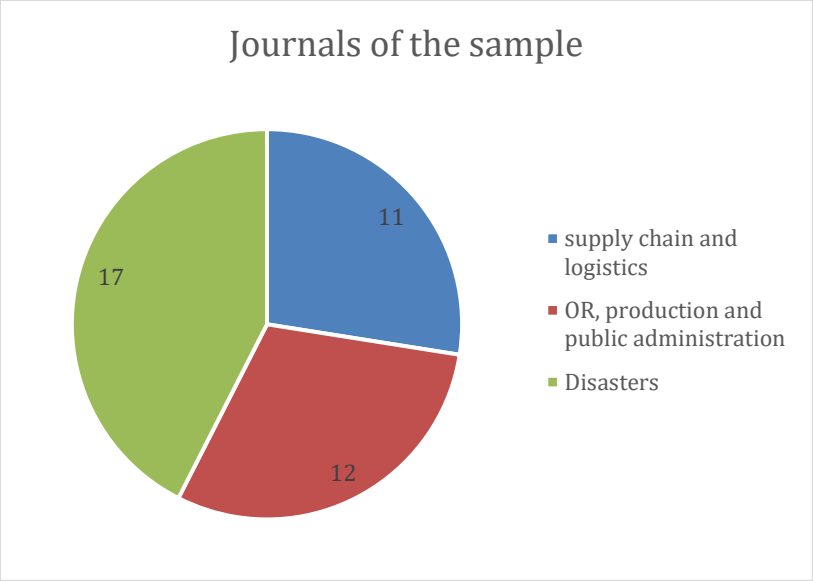

Figure 4.3:Journals of the sample

To define the sample of papers analyzed, some authoritative journals have been selected. Figure 4.3 allows to make some reflections about which kind of journals have published the papers; The majority of the papers are published on journals related to the disaster management field (30% of the total sample) while a smaller fraction is published on logistics or supply chain journals (27% of the total sample). Furthermore, it is important to highlight that within this last category the majority of papers are published on Journal of Humanitarian Logistics and Supply Chain Management (15% of the total sample). This journal is founded in 2011 specifically to spread HSC field knowledge.

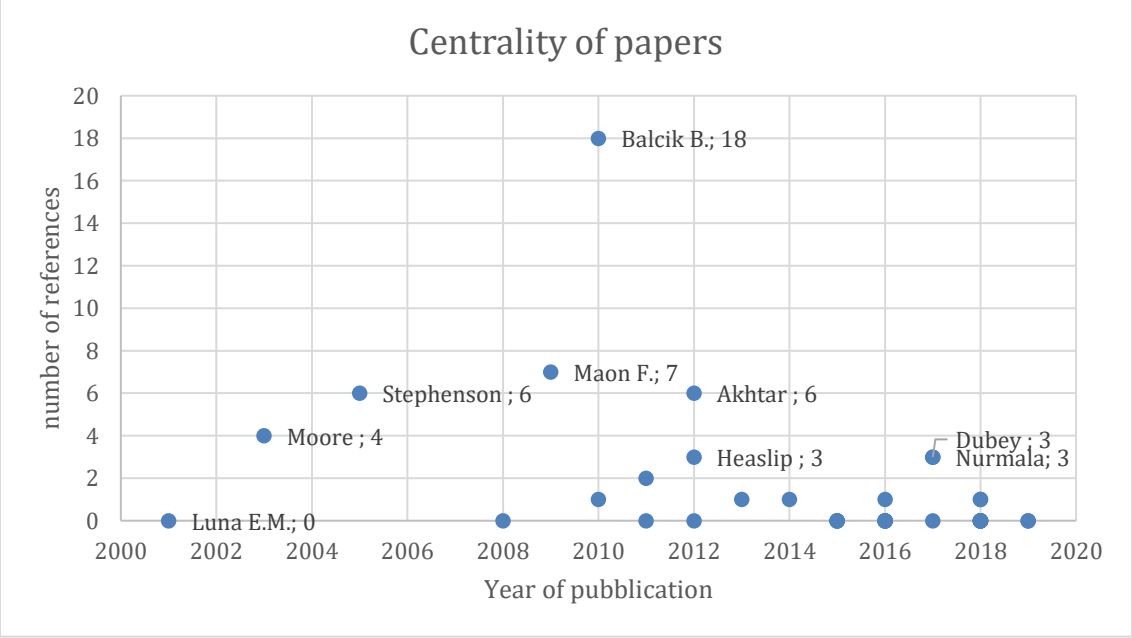

Figure 4.4: Centrality of the papers in the sample

The Figure 4.4 links the number of times each paper is mentioned by the other papers within the sample and the year of publication. At a first sight, it is observed that (Balcik, 2010) is an outlier because it is cited 18 times, so half of the authors analyzed in the literature review cite it. This underlines the relevance of that paper according to the other authors of the literature. In addition, it is important to notice also the relevance of (Stephenson, 2005), (Akhtar, 2012), (Maon, 2009) which are mentioned more than 5 times each by the other authors. As expected, the papers published in recent years are not mentioned many times on average compared to the previous one. From this analysis it seems that the most relevant papers published after 2013 are (Nurmala, 2017) and (Dubey, 2017) which have been cited 3 times each.

4.3 Definition of the SLR framework

As highlighted in the 4.1 Literature search methodology the data from the literature have been collected divided by 24 dimensions in the *SLR framework* for each paper (example in Appendix 3: Sample SLR framework). These dimensions are representative of collaboration and the reasons of this choice and a further description is reported below. Here a synthetic summary of all the variables (Table 4.3: SLR framework dimensions definition) gives a brief overview on them.

DIMENSION NAME	DESCRIPTION
Disaster Dimensions	
Phase	disaster stage (preparedness, response, recovery) for collaboration establishment
Location	place where the disaster has occurred and its features
Time	when the disaster has occurred
Cause	man-made or natural disaster
Speed of occurrence	the disaster's rate (slow-onset or sudden onset)
Size	Small-scale or large-scale disaster
Collaboration Dimensions	
Actors	who is involved in the collaboration and their features (#, features, role..)
Scope	towards the suppliers or the beneficiaries (downstream, upstream)
Type	Horizontal, vertical or cross-functional collaboration
Motivation	strategic reasons behind the relationship (beginning and ending)
Time span	the lasting of the relationship
Selection criteria	how the actors choose their partners in the collaboration
Institutionalization	formalized, not formalized collaboration and which type of formalization
Activities	activities performed, how many they are, and which reciprocal actors' responsibilities
Resources shared	which resources are the partners sharing and how they allocate them
Information share	which data are the partners sharing
Coordination Mechanisms	which mechanisms to collaborate exist (organizational and decision-making structures, communication tools)
Level	how much strong is the collaboration: strategical or operational
Relationship dynamics	operative benefits and costs of each actors and the mutual differences (un/balanced)
Enablers	which elements enables the collaboration
Challenges	difficulties and obstacles face in the collaboration
Outcomes	overall outcomes of collaboration (qualitative and quantitative)
Performance measurement	how to measure the performances of the collaboration, common KPI (qualitative and quantitative)
Risks	which are the collaboration and supply chain risks, shared or individual, metrics

Table 4.3: SLR framework dimensions definition

4.3.1 Disaster Dimensions

As can be observed in the description of the HSC, the definition of the humanitarian context is intrinsically linked to the response and management of a disaster (Mackay, Munoz, & Pepper, 2019). For this reason, in the SLR framework there is a section related to the disaster and its characteristics.

Firstly, the main dimension is the **Disaster phase**: this describes during which phase of the disaster the collaboration has been established. In particular, the classification of phases used, as better explained in the HSC part, includes preparedness, response and recovery. Indeed as Cozzolino (2012) underlines, logisticians and humanitarian are mainly involved in these three stages.

In the literature review sample two main clusters of papers could be identified: case studies, that are papers related to a specific disaster, and descriptive or theoretical papers which are focused on one aspect of collaboration without refereeing specifically to any disaster. Even if the sample included both the types of papers, disaster dimensions are collected for the first class of papers.

However, in this last case, at least the phase can be observed. Indeed, as underlined in 2.4 Disaster phases paragraph, the stages have markedly differing requirements for HSC design (Kovács & Spens, 2007; Mackay et al., 2019) and also for the collaboration itself (Falagara Sigala & Wakolbinger, 2019).

Secondly the **Location**: these dimension reports the place where the disaster has occurred and its features (e.g. economic status, geographical dispersion). In general, these aspects affect the HSC operations; as Mackay et al., (2019) states, they are key drivers in the investments of supply chain and logistic capabilities, infrastructure availability or coordination challenges. In addition, it is necessary to underline that sometimes the natural geographical and physical setting of some countries (e.g. Philippines) place these countries at a higher exposure to disasters (Luna, 2001) or to became a focal place for coordination - e.g. Hawaii and its coordination role in the Asia-Pacific region- (Prizzia, 2012).In this regard, it is important to underline that policies and procedures of the disaster response, are different depending on the countries. "*Some countries have strict guidelines for outside assistance, based on security restrictions, religion, or cultural preferences. Other countries accept assistance from any entity that will provide services and supplies*." (David Swanson & Smith, 2013)

The **time** dimension is as central as the spatial one. This dimension describes when the disaster has occurred and its duration. It can influence the humanitarian operations because the time horizon of a disaster has impact on the duration of humanitarian operations changing from "*temporary deployments to permanent fixtures* " (Mackay et al., 2019). Consequently, time affects also the collaboration performances.

Two other important aspects that describe the disaster are: the **cause** of the disaster itself (natural or man-made) and its **speed of occurrence** that is the rate of the disaster (slow or sudden onset).

Indeed, different authors (Cozzolino, 2012; Kovács & Spens, 2007; Van Wassenhove, 2006) classify the disaster in function of the causes and the occurrence. There are natural disasters which comprise both sudden-onset (e.g. earthquakes, avalanches, hurricanes, floods, tsunami, volcano eruptions…) and slow-onset (such as famine, poverty and drought). While the man-made category includes the sudden-onset (e.g. terrorist acts or nuclear accidents) but also slow-onset (e.g. political or refugee crises). This two dimension are essential as "*different types of disasters need to be managed in different ways: the aid provided to assist in a region's development is distinct from that given to deal with famine and drought; running refugee camps is very different to providing the kind of aid that is needed after a sudden-onset natural disaster or a nuclear accident*" (Cozzolino, 2012).

Finally, the framework includes also the **size** of the disaster. This dimension can influence the disaster in general and the collaboration.

In particular, the disaster scale can change the number of people involved and higher is the variety and number of actors involved, higher is the challenge for coordination (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2010) and the level of damage for infrastructure or communication tools (John, Gurumurthy, Soni, & Jain, 2018)

4.3.2 Collaboration Dimensions

Firstly, it has been collected general information about the nature itself of the collaboration to have a general idea about the context.

The first question faced has been: collaboration among whom?

So, the framework includes a column to investigate **the actors** of the collaboration. In particular, the aim is to track how many are the actors involved, which type of humanitarian actor do they are, which are their personal identifying data, which is their role in the supply chain (supplier, manufacturer, distributor, etc)

The data to be captured and the classifications for each actor are slightly different depending on the type of actor. In order to define the type of actor, it has been used the categories identified in the 2.2. Actors chapter.

These are the data the framework aims to collect according to the type of actor:

Humanitarian organizations: the name, the sector, the size and the type according to the localization degree and the relationship with the government. Regarding the type, as it has been already mentioned in section 2.2.1 Humanitarian organizations the classification used is the one of Lu & Xu (2015): the authors differentiate among International NGOs, Government Organized NGOs and Civil NGOs.
Private sector: the name of the company, the business sector and the role in the collaboration.
Media: the name, the nationality.
Military: the nationality, the unit.
Local community: the part of the local community that was involved.

Government**:** country (host, international, or neighboring country), governmental offices, institutions or other public authorities involved.
The number of actors involved is another important data to describe a collaboration (Nurmala, de Vries, & de Leeuw, 2018)

To better investigate the structure of the supply chain, the framework provides information about the **scope** of the collaboration i.e. if the shared activities are developed toward the customers or toward the suppliers (Frohlich & Westbrook, 2001). The direction seems an important variable for the analysis because it is one of the two dimensions identified by (Frohlich & Westbrook, 2001) to study the integration within the supply chain.

To classify the relationship among the actors, it has been inserted in the framework the **type's** column. This dimension has been used by (Wagner & Thakur-Weigold, 2018) for the operationalization of humanitarian–business partnerships in humanitarian logistics classifying the reciprocal position of the actors in the supply chain.

Wagner & Thakur-Weigold (2018) define precisely the type's categories: they consider *horizontal* the relationships between firms in the same stage of the network or of the same industry. This collaboration can occur 'through developing integrated horizontal links with operators at the same level of the supply chain' (Sanchez Rodrigues, Harris, and Mason 2015). While a *vertical* collaboration can be defined as the relationship that firms establish with their suppliers or, in downstream direction, with their customers (Cao and Zhang 2011). The vertical relationship is at different level of the supply chain stages. In addition, Wagner & Thakur-Weigold (2018) identify a third category of relationships: *cross-functional* relationships. They are the collaboration among different departments or functions within the firm itself.

What motivates the people can change how to do business. This is the reason why the **motivation** is a key dimension for a cross-sector collaboration in humanitarian supply chain. It represents the strategic reason behind the partnership, why it starts and, eventually, ends.

Many authors (Day, Melnyk, Larson, Davis, & Whybark, 2012; Kovács et al., 2018; Kovács & Spens, 2007; Leiras et al., 2013; Natarajarathinam, Capar, & Narayanan, 2009; Overstreet et al., 2011; Van Wassenhove, 2006) in the humanitarian field, even if not in an explicit way, point out that the motivation is probably the differentiator of the actors involved. Indeed, one of the main classifications of HSC actors distinguish them between *not-for-profit* organizations which include both government entities and non-governmental organizations, such as IFRC; and, *for-profit* organizations (Natarajarathinam et al., 2009). It is radical the difference between the organizations which emphasize social objectives and social impact rather than economic objectives and the private sector which pursue profit (Kovács et al., 2018). The effectiveness and efficiency of private sector supply chain could be computed as the difference between profit and loss, while for firms in humanitarian sector effectiveness could mean the difference between life and death of disaster victims (Day et al., 2012). For example Kovács & Spens, (2007) say that LSPs who get involved

in the humanitarian context are motivated by something that need to go beyond the profitability itself.

There are still open questions about companies' motivations to be involved in a partnership such as what can be considered valuable, what the companies can learn, how to measure this type of investment. Anyway, the first point for understand the collaboration is why the partners want to get involved in.

Another dimension inserted in the framework to describe the collaboration is the **time span**: how long does the collaboration lasts. The data about this dimension has already been considered significant by Coles, Zhang, & Zhuang (2016) who collect and classify the involvement of the actors according to the time horizon of the projects they were involved during the disaster response.

Another dimension is the identification of **selection criteria**: they represent all the information about how the actors choose their partners in the collaboration. This information seems to be critical to determine the success of the collaboration: but at the same time the selection of partner is complex and driven by multiple factors: it should be based on a match between identified gaps, the skills and capacities on offer and the ability of the agency to manage the partnership (Andrea Binder and Jan Martin Witte, 2007).

Additionally, the framework reports information about the **institutionalization** of the collaboration. In particular, this dimension assesses if the collaboration has been formalized with a signed contract or if it is only an informal agreement between the partners.

In the framework it is presented also a dimension called **activities**. This is a key element of the HSC research because the SCM mainly "*encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics*" (Overstreet, Hall, Hanna, & Kelly Rainer, 2011). In addition, the same variable is used by Nurmala, de Vries, & de Leeuw (2018) to classify the type of humanitarian-business partnership. They identify the logistics activities which involve the partners, and if these activities are single or many types, primary or secondary.

For this key role, it seems a significant dimension to differentiate a partnership and the framework tracks which are the activities performed, how many they are, and which reciprocal actors' responsibilities are present performing them, if they are primary or secondary.

Having access to the resources is one of the main HOs' reason to start a collaboration (Bealt, Fernández Barrera, & Mansouri, 2016); in addition, the resources contributed is another of the significant dimension to define a partnership in the study of Nurmala et al., (2018). For these reasons, it seems significant to collect information about which are the **resources** shared among the actors during the partnership relationship and how they allocate them.

One of the main resources that is generally shared is the information. However, due to its relevance, **information sharing** is another framework's dimension: it represents simply which information are shared among the partners during the collaboration. It seems significant because

"*For effective communication, coordinators must decide which information to share. Sharing too much information can overcrowd communication channels as well as information processing capacities of decision makers. Sharing too little information results in a situation where decision-makers lack the necessary input to develop an accurate operational picture*" (Steigenberger, 2016). In addition, the information management is identified as a critical success factor of humanitarian logistics (Pettit & Beresford, 2009).

In the framework another dimension included is the **coordination mechanisms.** They are generally defined as "*a set of methods used to manage interdependencies between organizations*" (Xu and Beamon, 2006, p. 4), however, to better understand them a further introduction should be made.

Firstly, Tatham & Houghton, (2011) describe the challenges related to the humanitarian logistics as a wicked problem, recognizing that the actors belong to many different organizations and, hence, there is a multiplicity of decision-making processes, which may be uncoordinated or incompatible. Coordinate organizations means "*working toward a common purpose*" (Curtis, 2015), but it is possible to reach a common goal just when each entity involved is aware of its own role and the one of the others. In order to understand the role each organization plays in reaching a particular objective while working with another entity, it is important to communicate intentions and discuss any potential obstacles (Kahn and Barondess, 2008). From these assertions emerges the need to specify among the coordination mechanisms: on the one hand there are the main organizational and decision-making structures, on the other hand, the communication tools that can be used to face this complexity and practically communicate. In addition, the framework collects also the standard operating procedures mentioned in the papers because *"coordination and collaboration among the providers of disaster relief would benefit from common standards for assessing emergencies and carrying out relief tasks"* (Altay, 2008).

Another key differentiator is related to **the level** of the collaboration. Indeed, the strength of a relation can be of different level: *strategical* or *operational*. Many authors, both from SC perspective or humanitarian one, describe the level with some small differences (Balcik et al., 2010; Leiras, de Brito Jr, Queiroz Peres, Rejane Bertazzo, & Tsugunobu Yoshida Yoshizaki, 2013; Mentzer, Min, & Zacharia, 2000; Overstreet et al., 2011; Pettit & Beresford, 2009). For this reason, the framework adopted a new definition that combines all this views,: *strategical means* when the entities view the partner as an extension of their own firm, involving the partner in long-term strategic initiatives and, when the partners improve or dramatically change their competitive position or *operational*, when the entities view the partner as a close associate improving supply chains efficiency and effectiveness without involving it in strategic or relevant decisions and generally during shorter time spans.

Borrowing the concept from collaboration in the SC, "*deciding on the type of partnering a retailer wants to accomplish with other firms and, accordingly, combining a partnering orientation and its implementation at an appropriate level, will retailers gain the full benefits of partnering"* (Mentzer et al., 2000). Indeed, if the level is not well understood, issues, lack of trust and conflicts

can easily arise . Mentzer et al., (2000) identify how to choose strategic or operational level as key decision. The analysis of many case studies related to the different orientation highlights that the implementation of strategic versus operational partnerships and the consequences of this choice in terms of competitive attainment and performance are completely different. are different. They also point out how often, in a common mentality, partnership is a synonym of strategic relationship. However, practitioners "should *acknowledge the fact that not all partnerships are strategic or necessarily need to be. Some partnerships are more appropriate as operational partnerships, especially in the short-term, possessing less trust and interfunctional coordination and, as a result, will not yield the same performance as strategic partnerships*." (Mentzer et al., 2000).

Even in the humanitarian sector all this concepts and issues are present, for this reason, this dimension has a strong relevance.
Finally, another level is sometimes added: it is the *tactical* one. Generally it is a medium-term relationship (Balcik et al., 2010) but often it is not clear the difference with the other levels. For this reason, in the literature review it has been reported as tactical but then classified as an operational or strategic level thanks to a personal perspective.

Another important dimension that is strongly dependent from the level of the collaboration is the so-called **relationship dynamics**. It represents which are the operative benefits (economic and no-economic rewards) and costs of each actor; and, when are presented, the mutual differences.

This variable is not often discussed in the SC collaboration and even in the HSC and few information are available, however, it seems a fundamental dimension. Indeed, collaboration is not a magical solution; studies demonstrate that the right balance of mutual benefits among all stakeholders is necessary to not deteriorate the relationship (Kovács, Moshtari, & Spens, 2018). Some authors dealing with SC collaboration remark how much important is the reward sharing in a long-term cooperation and how often the benefits are not equally shared (Kache & Seuring, 2014). In addition, a good collaboration requires not "*only share benefits among each other but also ensure that all benefiting parties share the costs associated*" (Pettit and Beresford, 2009; Kache & Seuring, 2014). However, the studies about the negative impact of a lack of reward sharing on collaboration is a gap even in the SC.

Many studies identify in their work the collaboration **challenges**. They represent the difficulties and obstacles faced in the collaboration or the barriers that can reduce the success of a partnership. Indeed, as it has been described in the narrative literature, the humanitarian context is characterized by numerous challenges specific of the context. Consequently, as expected the coordination arises even more issues. Van Wassenhove, (2006) refers to collaboration as a challenge because of the very different origins, history, geographical, cultural and political nature of the many possible actors or the possible contracts with the humanitarian principles and space. In particular Altay, (2008) remarks the importance of understanding the impediments to humanitarian coordination in order to obtain an effective result. Also Lewin, Besiou, Lamarche, Cahill, & Guerrero-Garcia, (2018) point out many challenges to maintain and improve coordination in an increasingly populous and complex aid community. In addition to that, according to Maghsoudi, Zailani,

Ramayah, & Pazirandeh, (2018) the reason of a poor collaboration in the HSC is due to the challenges that creates poor performance outcomes. Finally, the work of Hovhanessian, (2012) is very interesting: the author addresses the coordination barriers in vertical coordination between humanitarian organizations and commercial agencies. In particular, analyzing the literature she identifies the most common barriers as tackling and addressing them permits to improve the efficiency of aid delivering. It could be relevant to structurally classify the main challenges and barriers that have been identified in the current literature.

The previous dimension justifies the existence of a similar and opposite variable is expected: the **enablers**. They are the factors that instead facilitate collaboration. It should be specified that these drivers are more operative, they are different from the strategic motivations that drive a collaboration. This dimension has been identified by Moshtari & Gonçalves, (2017) who provided a categorization of the factors influencing collaboration among HOs, both in terms of enablers and barriers. They suggest three main factor clusters: contextual factors, inter-organizational factors or inner-organizational factors. In addition also Lewin et al., (2018) point put what can facilitate the coordination like the knowledge of the response actors before a crisis. In the literature review process, a light on the main enablers can add values in order to understand which are necessary for a successful partnership.

A further dimension is the **collaboration outcomes**. It seems a relevant dimension for different reasons: firstly, following the definition of Day, Melnyk, Larson, Davis, & Whybark, (2012) the supply management is a system aimed to identify, articulate and achieve desired outcomes over time. Consequently, the HSC is equally outcome driven (Day et al., 2012; Van Wassenhove, 2006), making the result an intrinsic driver of HSC context. Secondly, studying collaboration in the SC , according to Pettit & Beresford, (2009) collaboration enhances outcomes. Also Lewin, Besiou, Lamarche, Cahill, & Guerrero-Garcia, (2018) remark the interdependencies between the different actors and the possibility to collaborate towards mutually beneficial outcomes. Finally in the paper of Maghsoudi, Zailani, Ramayah, & Pazirandeh, (2018) they try to link coordination modes and performance outcomes in the humanitarian setting. For example, they find that resource sharing or standardization has a positive effect on performance outcomes. As a result, the overall outputs of collaboration (not the ones of single actors) are important to classify and describe a relation. In particular in the literature review are collected qualitative or quantitative results (respectively benefits and drawbacks, and for example savings of life, reduction of the costs, synergistic effects, coordination costs, etc).

The framework collects also information about the **performance measurement systems** to evaluate and control the partnership. In particular, it tracks if a performance measurement has been implemented or not and if significant metrics to evaluate a partnership have been adopted. This dimension is added to the literature review process, because in the supply chain context one key element to implement a partnership is to share the performance measurement (Mentzer et al., 2000). In particular, in the humanitarian context measuring the results of the collaboration enables to "*determine the performance of the partnership and to facilitate the justification of finances to*

donor organisations, the process of lessons learned, and the accountability of the activities, the communication between organisations" (Heaslip, Sharif, & Althonayan, 2012). Indeed, sharing the same KPIs among different actors means talking a common language among them (Nurmala, de Leeuw, & Dullaert, 2017). For this reason, it is necessary to investigate deeply the different systems to evaluate the performances.

The framework aims also at collect information about which are the collaboration and supply chain **risks**, if they are shared or individual and eventually their metrics. This seems to be an important dimension to evaluate the collaboration as Falagara Sigala & Wakolbinger (2019) states: "*Potential risks strongly drive the decision and the way that organizations initiate partnerships and select partners*".

4.4 Findings on literature review

The following section reports what is collected through the SLR. In particular firstly a synthesis of the main topics is summarized in two tables: a first one about the disaster dimensions and then a second table with the topics for the collaboration ones. In the 4.4.2 Disaster dimensions paragraph the disaster topics are deeply described based on the dimensions of the *SLR framework*. Then in the 4.4.3 Collaboration dimensions paragraph the collaboration findings are deeply described based on the dimensions of the *SLR framework*. For an example of the structure see Appendix 3: Sample SLR framework.

4.4.1 Synthesis

In this table are summarized the main topics emerged by the analysis of the papers of the chapter Systematic literature review on collaboration practices in the HSC. The table reports the main topics and the relative sources of each contents. The contents of the topics are then described in detail.

Disasters dimensions

Disaster phases	Preparedness	Preparedness practices	Uddin et al., 2011 ; Luna, 2001; Rodríguez-Espíndola et al., 2018; Wagner et al.,(2018); Balcik et al., 2010; Vega et al., 2015; Prizzia, 2012; Moore et al., 2003; Nurmala et al., 2018
	Response	Collaboration importance in this phase	Curtis, 2015; Dubey et al., 2017; Martin et al., 2016; Thompson, 2010; Tatham, Spens, & Kovács, 2017
		Relation with efficient communication	Curtis, 2015; Martin et al., 2016; Steigenberger, 2016; Tatham et al., 2017; Dubey et al., 2017
		Policies' dependence on location	Swanson et al., 2013; Thompson, 2010; Steigenberger, 2016
		Collaboration case studies in this phase	Adem, et alt., 2018; Akhtar, et alt., 2012; Balcik et al., 2010; Clarke et al. 2018; Moore et al., 2003; Octavia et al., 2016; Steigenberger, 2016
	Reconstruction	Community involvement	Falagara et al., 2019; Lu & Xu, 2015; Noori et al., 2016; Xu et al., 2018
		Long-term sustainability of community	Heaslip et al., 2014; Heaslip et al., 2012; Falagara et al., 2019; Moore et al., 2003 ; Lu et al., 2015
	Across the phases		Adem et al., 2018; Balcik et al., 2010; Curtis, 2015; Falagara et al., 2019; Heaslip & Barber, 2014; Vega & Roussat, 2015.
Location	Specific location		Adem et al., 2018; Akhtar et al., 2012; Carland et al., 2018; Carpenter et al., 2016; Coles et al., 2016; Curtis, 2015; Dubey et al., 2017; Heaslip et al., 2012; John et al., 2018; Lu & Xu, 2015; Luna, 2001; Martin et al., 2016; Moore et al., 2003; Naor, et al., 2018; Nolte et al,

		2011; Noori at al., 2016; Octavia et al., 2016; Thompson, 2010; Xu et al., 2018
Time	Recent disaster (last ten year)	Adem et al., 2018; Carland et al., 2018; Carpenter et al., 2016; Coles et al., 2016; Martin et al., 2016; Naor et al., 2018; Nolte et al., 2011; Rodríguez-Espíndola et al., 2018; Xu et al., 2018
Cause and speed of occurrence	Natural disasters and sudden onset emergencies	Akhtar et al., 2012; Balcik et al., 2010; Bealt et al., 2016; Carpenter et al., 2016; Coles et al., 2016; Curtis, 2015; Lu & Xu, 2015; Martin et al., 2016; Naor et al., 2018; Noori et al., 2016; Rodríguez-Espíndola et al., 2018; Steigenberger, 2016; Thompson, 2010; Xu et al., 2018
	Man-made disasters (two sudden and one slow)	Steigenberger, 2016; Uddin & Hossain, 2011; Adem et al., 2018
Size	Large- scale	Adem et al., 2018; Akhtar et al., 2012; John et al., 2018; Moore et al., 2003; Naor et al., 2018; Noori et al., 2016; Rodríguez-Espíndola et al., 2018; Steigenberger, 2016; Thompson, 2010; Uddin & Hossain, 2011

Figure 4.5:Synthesis disaster dimensions findings

Collaboration dimensions

DIMENSION	CONTENT	PAPERS
Actors	HO – HO collaborations	Clarke et al., 2018; Tatham & Houghton, 2011; Uddin et al., 2011 by Lu et al. 2015
	Government – HO collaborations	Moore et al., 2003; Rodríguez-Espíndola et al., 2018, Akhtar et al., 2012; Luna, 2001, Xu, Xu, Lu, & Wang 2018, Curtis, 2015; Martin et al., 2016; Stephenson, 2005
	HO – private sector collaborations	David et al., 2013; Heaslip et al., 2014a; Li et al., 2019; Nurmala et al., 2017, Maon, Lindgreen et al. 2009, Nurmala et al., 2018, Bealt et al., 2016; Falagara et al., 2019; Vega et al., 2015 Carland et al., 2018
	Civil-military collaborations	Heaslip et al., 2012 Naor et al,, 2018; Thompson, 2010
	Multiple actors collaborations	Balcik et al., 2010; Naor et al., 2018; Noori et al., 2016; Octavia et al., 2016
	Roles	Prasanna et al., 2018 Vega et al., 2015
Type	Horizontal	Nurmala et al., 2018, Balcik et al., 2010, Naor et al., 2018, Clarke et al., 2018, Xu et al., 2018
	Vertical	Nurmala et al., 2018, Carland et al., 2018, Prasanna et al., 2018, Adem et al. 2018, Xu et al., 2018
Scope	Upstream	Prasanna et al., 2018
	Downstream	
Motivations	For-profit companies	
	Higher profits and market shares	Balcik et al., 2010, Vega et al., 2015
	Start operations in the country or region	Bealt, Fernández Barrera, et al., 2016
	Protect their long-term business interests	Maon, et al., 2009, Nurmala et al., 2017
	Corporate social responsibility	Nurmala et al., 2017, Li et al., 2019, Falagara et al., 2019, Maon et al., 2009, Balcik et al., 2010, Bealt et al., 2016
	Brand motivation	Balcik et al., 2010, Bealt et al., 2016, Maon et al., 2009, Nurmala et al., 2017, Falagara et al., 2019
	Staff motivation	Balcik et al., 2010, Maon et al., 2009, Nurmala et al., 2017, Falagara et al., 2019
	Learn agility	Nurmala et al., 2017, Maon et al., 2009
	Access to well-established networks	Nurmala et al., 2017
	Improvement of risk management	Maon et al., 2009
	Not for profit organizations:	
	Access to a variety of resources or increase the available capacity of them	Bealt et al., 2016, John et al., 2018, Lu et al., 2015, Moore et al., 2003, Stephenson, 2005, Heaslip et al., 2012, Falagara et al., 2019
	Learn from the partner or reuse their expertise	Bealt et al., 2016, Nurmala, de Vries, & de Leeuw, 2018, Nurmala et al., 2017, Thompson, 2010, Falagara et al., 2019

	Combine strengths, weakness and knowledge of the partners	Lu et al., 2015, Stephenson, 2005
	Focus on their core business competency	Falagara et al., 2019
	Minimisation of costs and maximization of benefits for the people affected	Akhtar, Marr et al.,2012, Moore et al., 2003, Stephenson, 2005, Uddin et al., 2011
	Reduce capital investment	Falagara et al., 2019
	Donors'pressure	Nurmala et al., 2017
	Decrease of overlapping services	Coles et al., 2016
	Invest and support the local companies to enhance the local sustainability	Falagara et al., 2019
	Bring together participants that may have little interaction	Prizzia, 2012
	Incentives from the government	Xu et al., 2018
	End of partnership	
	Follow the initial plan	Heaslip et al., 2012
	End of need	Coles et al., 2016
	Partner leaving	Coles et al., 2016
	End of grant and the partnership has been merged	Coles et al., 2016
	Poor quality	Coles et al., 2016
	Lack of time	Coles et al., 2016
Time spam	Duration as element influences the collaboration	Prasanna et al., 2018, Coles et al., 2016, Balcik et al., 2010, Xu et al., 2018
	Different time horizon perspective of the actors	Falagara et al., 2019
	Duration is related to the level of the partnership	Balcik et al., 2010, Coles et al., 2016, Maon et al., 2009
Selection Criteria	Project plan before starting	Lu et al. 2015
	Industry of the organizations	Clarke et al., 2018
	General criteria for NGO – military collaboration	Heaslip et al. 2012
	General criteria for PS -HO collaboration	Nurmala et al., 2017, Falagara et al., 2019
	Enabled by information about the potential partners	Xu et al., 2018
	Obvious choice	Thompson, 2010
Institutionalization	Importance to set agreement during preparedness	Rodríguez-Espíndola et al. 2018
	Agreements strengthen the relationship	Xu et al., 2018, Lu et al. 2015
	Contracts in weak collaboration	Stephenson 2005
	Contracts in short-term collaboration	Falagara et al., 2019, Vega et al., 2015
	Contracts for logistics activities	Balcik et al. 2010
	Link agreement- type of actors	Falagara et al., 2019, Vega et al., 2015, David et al., 2013
Activities	<u>Primary</u>	
	Procurement	Nurmala et al., 2018, Balcik et al., 2010
	Pre-positioning	Bealt et al., 2016
	Pre-planning	Balcik et al., 2010
	Transportation	Bealt et al. 2016, Falagara et al., 2019, Balcik et al., 2010, Vega et al. 2015

	Warehousing	Bealt et al. 2016, Vega et al. 2015, Adem, Childerhouse et al., 2018, Falagara et al., 2019
	Distribution	Bealt et al. 2016, Vega et al. 2015
	Reverse logistics	Falagara et al., 2019
	Supporting activities	
	Reporting	Falagara et al., 2019
	Training	Falagara et al., 2019, Lu et al., 2015, Xu et al., 2018, Adem et al., 2018
	Provision of IT systems	Bealt et al., 2016, Falagara et al., 2019, Nurmala et al., 2017
	Support to improve logistics functions	Nurmala et al., 2017
	Planning	Heaslip et al., 2014, Lu et al., 2015, Luna, 2001, Xu et al., 2018
	Infrastructure reconstruction	Heaslip et al., 2012, Lu et al., 2015
	Balance the medical effort	Naor et al., 2018, Noori et al., 2016
	Financing	Heaslip et al. 2012, Maon et al., 2009; Prasanna et al., 2018, Nurmala et al., 2017, Lu et al., 2015, Xu et al., 2018
Rescources	Human capital, skills, expertise and strategies	Bealt et al., 2016, Nurmala et al., 2017, David et al., 2013, Balcik et al., 2010, Heaslip et al., 2014, Thompson, 2010
	Technologies	Bealt et al., 2016, Nurmala et al., 2017, Martin et al., 2016, Tatham et al., 2017
	Infrastructures and spaces	Li et al., 2019, Balcik et al., 2010
	Equipment, asset, vehicles, facilities, maps	Nurmala et al., 2018, Rodríguez-Espíndola et al., 2018, Thompson, 2010
	Raw-materials and supplies	Naor et al., 2018
	Financial contributions	Akhtar et al., 2012, Falagara et al., 2019 Maon et al., 2009, Nurmala et al., 2018, Stephenson, 2005, Vega et al., 2015
Information sharing	Availability assessment	Balcik et al., 2010, Akhtar et al., 2012, Clarke et al., 2018
	Needs assessments, logistics capacity or inventories	Xu et al., 2018, Martin et al., 2016, Balcik et al., 2010, Clarke et al., 2018
	Enabled by coordination mechanisms	Xu et al., 2018, Martin et al., 2016, Balcik et al., 2010, Clarke et al., 2018, Uddin et al.2011
	Military enables the exchange of information	Heaslip et al., 2014, Thompson, 2010
Coordination mechanism – Decision making	Collaboration structures and decision-making	
	Single center mode	Lu et al., 2015, Balcik et al., 2010, John et al., 2018
	Value/supply-chain mode	Lu et al., 2015
	Networked mode	Lu et al., 2015
	Chain coordinator/umbrella organization	Mehta et al., 2003, Akhtar et al.,2010, Rodríguez-Espíndola et al. 2018, Prizzia, 2012, Moore et al., 2003, Balcik et al., 2010
	Clusters	Clarke et al., 2018, Balcik et al., 2010, Lu et al., 2015, Noori et al. 2016, John et al., 2018
	Network structure	Stephenson, 2005, Uddin et al., 2011, Steigenberger, 2016, Xu et al., 2018
	Sop	Heaslip et al., 2012, Maon et al., 2009, Octavia et al., 2016
	Communication tools	Martin et al., 2016
	Platforms	Xu et al., 2018, Octavia et al., 2016
Level	Operational	Falagara et al., 2019, Coles et al., 2016, Akhtar et al., 2012, Balcik et al., 2010, Maon et al., 2009, Nurmala et al., 2017, Nurmala et al., 2018, Xu, Xu, Lu, & Wang, 2018
	Tactical	Falagara et al., 2019, Xu, Xu, Lu, & Wang, 2018

	Strategic		Coles et al., 2016, Akhtar et al., 2012, Maon et al., 2009, Balcik et al., 2010, Nurmala et al., 2017, Steigenberger, 2016, Nurmala et al., 2018, Prasanna et al., 2018,, Clarke et al., 2018, Xu, Xu, Lu, & Wang, 2018
Relationships dynamics	Balance		Balcik et al., 2010, Bealt et al., 2016, Clarke et al., 2018, Coles et al., 2016, Noori et al., 2016, Vega et al., 2015, Xu et al., 2018
	Individual costs, rewards or risks		Balcik et al., 2010, Bealt et al., 2016, Li et al., 2019, Stephenson, 2005, Xu et al., 2018
Challenges [C] **Enablers [E]**	Culture	Different culture [C]	Adem et al., 2018; Akhtar et al., 2012; Balcik et al., 2010; Curtis, 2015; Heaslip et al., 2012; Maon et al., 2009; Naor et al., 2018; Nurmala et al., 2017; Prasanna et al., 2018; Steigenberger, 2016; Thompson, 2010
		Cultural congruence [E]	Balcik et al., 2010; Curtis, 2015; Thompson, 2010
		Different priorities [C]	Adem et al., 2018; John et al., 2018; Maon et al., 2009; Prasanna et al., 2018; Nurmala et al., 2017; Luna, 2001, Heaslip et al., 2012; Noori et al., 2016,
	Experience	Lack of experience and competencies [E]	Balcik et al., 2010; Falagara et al., 2019; Maon et al., 2009; Moore et al., 2003 Vega et al., 2015, Nurmala et al., 2017, Tatham et al., 2017, John et al., 2018.
		Experience and partners' network [E]	Nolte et al., 2011; Uddin et al., 2011, Adem et al., 2018
	SOP	Different procedures or standards [C]	Maon et al., 2009; Naor et al., 2018; Tatham et al., 2017
		Same SOP [E]	John et al., 2018; Nolte et al., 2011; Tatham et al., 2017.
	Information sharing	Lack of information sharing or poor communication [C]	Adem et al., 2018, Rodríguez-Espíndola et al., 2018, Curtis, 2015, Heaslip et al., 2014; John et al., 2018; Maon et al., 2009; Moore et al., 2003; Steigenberger, 2016
		Information sharing [E]	Curtis, 2015; John et al., 2018; Prasanna et al., 2018; Rodríguez-Espíndola et al., 2018; Tatham et al., 2017, Steigenberger, 2016 Dubeyet al., 2017
		Meetings useless and damaging [C]	Akhtar et al., 2012; Balcik et al., 2010 Moore et al., 2003
		Language barrier [C]	Adem et al., 2018; Akhtar et al., 2012; Heaslip et al., 2014; Moore et al., 2003, Akhtar et al., 2012; Balcik et al., 2010
	Commitment	Low level of commitment [c]	Adem et al., 2018; Bealt et al., 2016, Nurmala et al. 2018
		Commitment positive [E]	Dubey et al., 2017; Prasanna et al., 2018 Uddin et al., 2011
	High bureaucracy [C]		Adem et al., 2018; Prasanna et al., 2018 Curtis, 2015; Luna, 2001; Moore et al., 2003; Steigenberger, 2016
	Trust [E]		Adem et al., 2018; John et al., 2018; Lu et al., 2015; Nolte et al., 2011; Prasanna et al., 2018; Steigenberger, 2016; Stephenson, 2005; Thompson, 2010
	Leadership capabilities or structured decision making [E]		Akhtar et al., 2012 Rodríguez-Espíndola et al., 2018 Balcik et al., 2010 Nurmala et al., 2018, Adem et al., 2018, Maon et al., 2009, Steigenberger 2016, Adem et al., 2018; Thompson, 2010
	Competition [C]		Maon et al., 2009 Heaslip et al., 2012; Naor et al., 2018; Stephenson, 2005
	Lack of strategic perspective [C]		Falagara et al., 2019; Moore et al., 2003.
Outcomes	<u>Quantitative</u>		
	Reduction of costs		Balcik et al., 2010, Adem et al., 2018, David et al., 2013, Falagara et al., 2019, Heaslip et al., 2012, Maon et al., 2009, Nolte et al., 2011, Prasanna et al., 2018
	Better response time		Nolte et al., 2011, Octavia et al., 2016, Adem et al., 2018; Heaslip et al., 2012; Maon et al., 2009
	Increase the economic rewards		David et al., 2013
	Number of projects developed		Xu et al., 2018
	Number of beneficiaries reached		Moore et al., 2003; Noori et al., 2016
	Increase in savings of lives		Bealt et al., 2016
	Inventory turnover improvement		Balcik et al., 2010
	Costs of the relation itself		Nolte et al., 2011, Xu et al., 2018

	Qualitative	
	Increase of efficiency	Rodríguez-Espíndola et al., 2018, Adem et al., 2018; Bealt et al., 2016; Maon et al., 2009, Naor et al., 2018; Nurmala et al., 2017, Tatham et al., 2017, Xu et al., 2018, Bealt et al., 2016
	Decrease in duplications and gaps	Balcik et al., 2010 Clarke et al., 2018 Tatham et al., 2017
	Access to better capabilities and resource	Akhtar et al., 2012; Nolte et al., 2011
	Enhance humanitarian capacities	Maon et al., 2009; Nurmala et al., 2017
	Reduce the differences among the actors	Xu et al., 2018, Clarke et al., 2018, Stephenson, 2005
	Higher security	Adem et al., 2018, Xu et al., 2018
	Effective communication	Adem et al., 2018, Xu et al., 2018
	Increase in the bargaining power	Balcik et al., 2010
	Jointly develop or product customize	Falagara et al., 2019, Prasanna et al., 2018
	Enhancement of innovation	Maon et al., 2009; Prasanna et al., 2018
	Better visibility of the supply chain	Nurmala et al., 2017
	Better quality	Nolte et al., 2011
Performance measurement	Partnership evaluation system	Xu et al., 2018, Rodríguez-Espíndola et al., 2018
	Network metrics	Noori et al., 2016, Uddin et al.2011
Risks	Mention of risks	Falagara et al., 2019 Carland, Goentzel et al. 2018, Li et al., 2019, Martin et al., 2016, Balcik et al., 2010

Table 4.4:Synthesis collaboration dimension findings

4.4.2 Disaster dimensions

Here are reported the contents about the disaster dimensions: five paragraphs represent the five dimensions and they are then divided in sub-elements.

Phases

The information on disaster's phases are reported divided by type of phases: preparedness, response and recover. However, an additional paragraph is present for the papers that represent all the phases: it is a collaboration across the phases.

Preparedness:

The selected sample includes numerous papers related only to this stage. The high number of studies reflects the increasing importance given by the academic word to preparedness' phase (Kovács & Spens, 2007). However, some of the papers are not really focused on how to develop a collaboration in this stage, but they identify (before the disaster occurs) practices that are useful later, for the collaboration in the response or recovery phase.

In particular Uddin & Hossain (2011) , using a network-enabled model in a terrorist attack context, find that there is a positive correlation between network relation and coordination preparedness . This means that increasing the involvement within a network it is more probable that also the ability to coordinate in preparedness increases.

There are many simulation models related to coordination activities: the community-based approaches analysed by Luna (2001),which shows the positive effect of a better integration with

local communities. The concept is that, the training and organization of the community permit them to be better prepared for an efficient response. In the author's opinion, for a valuable training and a correct organization an interaction and collaboration with the NGOs is mandatory.

Another idea is the application of a multi-organisational approach to facility location, stock prepositioning, distribution and resource allocation that could help in a better decision making in the later stages. The application of this model in the preparedness permits to analyze different scenarios and find the theoretical optimal solution, with a possible influence on the practical response decision (Rodríguez-Espíndola, Albores, & Brewster, 2018).

Similarly, the project of Wagner & Thakur-Weigold (2018) consists in the implementation of an humanitarian HEB Game with actors from the field. The results of this training, in a preparedness stage, is a higher awareness of the need for a more integrated and collaborative supply chain. In particular, the silos mentality is undermined: the respondents want an integration not just within logistics but also with the other function and starting from the earliest stages of planning right up to program implementation.

Finally, the authors Balcik et al. (2010) identify some pre-planning mechanism or best practices that can help the collaborative actions in the response phase. Some examples are joint procurement, the creation of a list of candidate suppliers or the UN Humanitarian Response Depot (UNHRD) network, managed by the WFP, of warehousing for pre-position relief supplies. Steigenberger, (2016) insists on the importance of a disaster response plan, prepared in the preparedness and adapted later, mostly to inform all parties about their roles and responsibilities.

Similarly focusing on a collaboration between LSP and an humanitarian organization, Vega & Roussat (2015) underline the possible role of the LSPs. They can help the partner in improving its disaster preparedness skills or to provide a set of best practices (coming also from the business context). There is a concrete case about this type of collaboration: the partnership between DHL and UN agencies.

It is interesting also the view that the authors have on the SC design: the logistics service providers can have the power and capacity to build, in the preparedness stage, a cost-efficient SCs that is 'dormant' but ready to become an agile 'active' one.

In a complete different context, Prizzia (2012) analyses a series of existing mechanisms, training program, procedures and organizations that, in the Hawaii context, can help for a future collaboration in the Asian-Pacific region in crisis case.

Furthermore, the case of study of Mozambique flooding is a concrete example of a preparedness mechanism: the INGC was created by the government with a task of disaster management. It is responsible primarily for the preparedness (but also for the response), creating awareness campaign or collaborating with private sector to obtain the necessary capacity. However, maybe for the concurrence of the new structure and the sudden flood, the mechanism has failed (Moore, Daniel, & Eng, 2003).

In conclusion even if there are recent studies that are focusing in this phase there is still a lack: as Nurmala, de Vries, & de Leeuw (2018) proposed, it is necessary for the commercial sector –but also for the other actors- to be active in setting up humanitarian logistics partnerships that focus on improving preparedness and reconstruction rather than response.

Response:

The response phase is surely the most studied phase in a collaboration context. Indeed, this is the stage when the coordination challenges arise and a collaboration can change the effectiveness of disasters operations (Curtis, 2015; Dubey, Altay, & Blome, 2017; Martin, Nolte, & Vitolo, 2016; Thompson, 2010). As the OCHA (2014a, p. iii) remarks "*Effective coordination is the hidden force multiplier in emergency response. With coordination, one plus one plus one does not equal three; it equals five or ten. It reduces duplication and competition and allows different agencies and organizations to complement each other and give added value*" (Tatham, Spens, & Kovács, 2017)

In the sample analysed, many authors (Curtis, 2015; Martin et al., 2016; Steigenberger, 2016; Tatham et al., 2017) identify the positive correlation between an efficient communication and an effective response coordination. In particular Tatham et al., 2017 analyse the concept of a common operating picture (COP) within the humanitarian response. However, a real implementation should be necessary to identify the real impact on an optimal decision-making process.

Also well-functioning information and communication technologies can positively affect this phase (Martin et al., 2016). Especially information sharing among actors (for example about their available capabilities and resources) creates transparency and helps everyone to understand their role in a coordinated response (Dubey et al., 2017).

Secondly, should be underlined that response's policies and procedures are different based on the countries affected (David Swanson & Smith, 2013). Indeed, some countries have precise guidelines for assistance (security reasons, religion tradition or cultural restriction). Also the presence of military is strongly affected by this factor (David Swanson & Smith, 2013; Thompson, 2010). Similarly, developing and developed countries follows a different approach in a disaster response phase (Steigenberger, 2016). The latter generally focuses on creating local autonomy and flexibility.

Many papers are real case of study: they describe a collaboration in the response phase (Adem, Childerhouse, Egbelakin, & Wang, 2018; Akhtar, Marr, & Garnevska, 2012; Balcik et al., 2010; Clarke & Campbell, 2018; Moore et al., 2003; Octavia, Halim, Widyadana, & Palit, 2016). For example the application of Cluster mechanisms, that in the manifesto includes both response and preparedness practices to facilitate the collaboration (Clarke & Campbell, 2018). Otherwise In the East Java region, there is an example of a joint platform (Octavia et al., 2016) or in the Mozambique floods the creation of a governmental mechanism, the INGC, that has also a coordinating role in the disaster response (including distribution of food, tents, and other supplies) (Moore et al., 2003).

As highlighted by Steigenberger, (2016), the research on the multi-agency coordination in response is fragmented: many authors, due to the complexity of a disaster event, prefer to contribute with in-depth case of studies. Obviously, if generalized results remain isolated, "*it will continue to be difficult to draw conclusions about or develop recommendations for other disaster response situations".*

Falagara Sigala & Wakolbinger, (2019) remark that humanitarian organizations in this stadium generally established ad-hoc relationships, based on the received funding and knowing exactly what they need. However, these relationships are generally short-term, based only on cost-reduction and without a strategic perspective.

This fact leads to an interesting question: which is the choice of the most opportune time to establish a collaborative relationship? Many scholars (Bealt, Fernández Barrera, & Mansouri, 2016; Falagara Sigala & Wakolbinger, 2019; Heaslip & Barber, 2014; Nurmala et al., 2018; Scholtens, 2008) point out the importance and positive impact of a prior arrangement, signed in the preparedness phase but active in the response. There are different reasons why the pre-disaster stage could be elected as the preferential one: organisations have time and " *as partnerships are challenging, and it needs a lot of effort and resources from both sides first to establish and second to maintain them […] during preparation phase both partners have the time to invest in and negotiate the terms* " (Falagara Sigala & Wakolbinger, 2019). If the partnership is set before the disaster, this time frame facilitates the opportunities for integrated efforts, pre-positioning of resources and personnel and use of logistical best practices (Bealt et al., 2016). In addition, Bealt et al., (2016), dealing with a collaboration between LSP and HO, underline an interesting challenge that could be extent for other type of collaboration: if the relationship with the LSPs is not beforehand, they may be busy helping other agencies and do not have time. Or, that LSP may charge really high prices that could be controlled with an agreement in the preparation.

Scholtens, (2008) highlights another driver to shift the partnership in a preparedness stage: it is not realistic to create a structured multidisciplinary collaboration (i.e., including operational leadership and supreme command) during the few hours of a first response. The chaos and pressure of time cannot permit to waste time in setting this structure.

Also the scholars Nurmala et al., (2018) remark that the lack of performance during the disaster is due to poor preparedness: when the emergency strikes, it is often too late to develop solution not already established.

However, in practice, even if the willingness of practitioners is to set the relationship in a pre-disaster stage, few are the concrete examples (Bealt et al., 2016; Nurmala et al., 2018). Two main reasons can be generalized from the Bealt et al., (2016) interviews: on one hand HOs prefer to maintain their independence until the disaster happened, on the other hand, the private companies has to remain in a competitive market, being unable to commit to a single HO.

Another remarkable issue is that HOs, in particular small or medium size, face financial constraints as they receive donations only after a disaster occurs (Falagara Sigala & Wakolbinger, 2019). There is no capital dedicated to preparedness in general, and even less for setting a collaboration.

Reconstruction:

The studies on this phase mainly express a central topic: the importance of collaboration at two levels, within the entities engaged (often NGOs or governments) and between them and the local communities (Falagara Sigala & Wakolbinger, 2019; Lu & Xu, 2015; Noori & Weber, 2016; Xu, Xu, Lu, & Wang, 2018).

Indeed, the overall reconstruction of a community is very complex: house rebuilding, the provision of health care, the need for psychological relief and long-term development are necessary activities. In opinion of Lu & Xu, (2015) the NGOs collaboration must be sustained and embedded, requiring jointly tasks such as disaster surveys and requirement assessments as well as project planning, implementation and review. Noori & Weber, (2016) highlights that the collaboration involved both small and large-scale organizations. Maybe the reasons can be found in the categorization of Lu & Xu, (2015): they sustain that each type of NGOs (INGO, LNGO, GNGO) is specialized in some activities. Even small local NGO have some point of strengths that can be exploited in the collaboration. While Xu et al., (2018) remark the collaboration between governments and NGOs that can improve the efficiency and quality of reconstruction.

On the other hand, all participants want to promote the long-term sustainable development of the affected communities. They cannot remain forever in the destroyed area. This topic is particularly critical for the military: when is the right time to leave the communities and stop the operations? (Heaslip & Barber, 2014; Heaslip, Sharif, & Althonayan, 2012). The solution is to transfer task, responsibilities and knowledge directly to the civilian actors (Heaslip et al., 2012). Similarly Lu & Xu (2015) identify different mechanisms to create a sustainable local recovered community, such as '*passing on the gift*' or the establishment of self-help groups (SHGs) and mutual assistance committees (MACs) in the villages. Similarly, the HOs are more used to focus on logistic capacity building exploiting the local logistic service provider for the recovery stage (Falagara Sigala & Wakolbinger, 2019).

Finally, should be underlined an observation of Moore et al., (2003): they point out that the humanitarian aid organisations are less capable of coordinating in the recovery-period. Maybe this could be linked to the second cluster of the studies, it is essential the training and creation of a sustainable local community.

Across phases:

Some studies analyses collaboration across all the disaster phases (Adem et al., 2018; Balcik et al., 2010; Curtis, 2015; Falagara Sigala & Wakolbinger, 2019; Heaslip & Barber, 2014; Vega & Roussat, 2015).

They are relevant because the phases are one differentiator for humanitarian logistic and collaboration (Mackay et al., 2019). For example, Vega & Roussat (2015) identifies how the roles of the LSPs in a collaboration with HOs can change through the different phases. While, in the same context, Falagara Sigala & Wakolbinger (2019) highlights how motivations for outsourcing, activities, risks and also selection criteria of the partners are completely different in function of the stage involved. Also in the military world, different logistical requirements, resources and skills change across the emergency lifecycle (Heaslip & Barber, 2014). Finally, in the specific collaboration between NGOs (local and international) the authors Adem et al., (2018) differentiate the activities engaged during the preparedness, response or recovery. More studies are necessary to identify the influence on the other collaborations' dimensions.

Another important result is the recommendation of Falagara Sigala & Wakolbinger, (2019): they highlights how " *the outsourcing decisions* (and in general collaborative decisions) *taken in each phase have a strong impact on the following phases*".

For this reason, an integrated view with a strategic perspective is a necessary step. Analysing the literature, it seems the importance of this holistic view remain a relevant gap.

Location

Regarding the location dimensions what can be conclude is that about half of the papers identify a specific location where the disaster takes place.

Classifying by region, they deal firstly with Asia (South, East or Western) (Adem et al., 2018; Akhtar et al., 2012; Carpenter & Grünewald, 2016; Dubey et al., 2017; John et al., 2018; Lu & Xu, 2015; Luna, 2001; Martin et al., 2016; Noori & Weber, 2016; Octavia et al., 2016; Thompson, 2010; Xu et al., 2018), then Mexico and Central America (Haiti in particular) (Naor, Dey, Goldstein, & Rosen, 2018; Nolte & Boenigk, 2011; Prizzia, 2012; Rodríguez-Espíndola et al., 2018), and finally Africa (Southern or East)(Carland, Goentzel, & Montibeller, 2018; Moore et al., 2003). In addition two papers are related to North America(Coles et al., 2016; Curtis, 2015) and one to Kosovo (Heaslip et al., 2012). There are also two specific of Europe (Scholtens, 2008; Wimelius & Engberg, 2015) but they are more linked to crisis management in general.

In particular, even if the authors do not explicitly mention the economic status of the disaster location, it is necessary to underline that, according to the definition of United Nations, (2019), the majority of these countries (excluding North America and Europe) are developing.

Also, the geographical dispersion is never analysed and mentioned.

According to the Mackay et al., (2019) these factors are important drivers and maybe their impacts should be better clarified.

Finally, as mentioned in the framework definition, the location itself can naturally expose a country to higher disasters occurrence. Some authors identify this aspect (Carpenter & Grünewald, 2016; Curtis, 2015; Luna, 2001; Moore et al., 2003; Prizzia, 2012) with its consequences and implications.

It is important to underline also how, as explained in the response phases, the policies and procedures of this phase, are different in function of the countries. "*Some countries have strict guidelines for outside assistance, based on security restrictions, religion, or cultural preferences. Other countries accept assistance from any entity that will provide services and supplies*." (David Swanson & Smith, 2013). A good knowledge of the country and its regulation or policies are necessary information for setting a collaboration.

Time

Regarding the disaster time the sample analyzed focuses on disasters quite recent, indeed half of them are related to the last ten years disasters (Adem et al., 2018; Carland et al., 2018; Carpenter & Grünewald, 2016; Coles et al., 2016; Martin et al., 2016; Naor et al., 2018; Nolte & Boenigk, 2011; Rodríguez-Espíndola et al., 2018; Xu et al., 2018). In addition, the sample confirmed the increasing trend of collaborations research after Haiti 2004. the reason is due to Haiti's earthquake big impact (media and social one), which has cause a higher interests and attention on the humanitarian research and private sector involvement (Balcik et al., 2010; Nurmala et al., 2017).

Cause and speed of occurrence

Regarding the disaster cause and speed of occurrence it is important to identify these two factors because, as demonstrated in the military context, there are a lot of differences in the kinds of military cooperation depending upon whether the disaster is "*natural*" or "*man-made*". Indeed, in natural disasters, the most important involvement of military "*is in the crucial life sustaining days immediately after the event"*. While, in man-made complex emergencies, "*military assistance to the logistical provision of aid is more beneficial when wide spread military expertise is provided over time"* (Heaslip & Barber, 2014).

Studying the sample, it can be pointed out that, in the case of study, more than half are caused by natural disasters and are sudden onset emergencies (Akhtar et al., 2012; Balcik et al., 2010; Bealt et al., 2016; Carpenter & Grünewald, 2016; Coles et al., 2016; Curtis, 2015; Lu & Xu, 2015; Martin et al., 2016; Naor et al., 2018; Noori & Weber, 2016; Rodríguez-Espíndola et al., 2018; Steigenberger, 2016; Thompson, 2010; Xu et al., 2018) . Often, they are related to earthquakes.

The slow onset natural disasters are often flooding: indeed, the floods generally start and can be managed easily, but if the phenomenon goes on, after some months it is declared the "*emergency state*" (John et al., 2018; Moore et al., 2003).

Only three papers are man-made disasters: two are sudden (Steigenberger, 2016; Uddin & Hossain, 2011) and one is a slow one (Adem et al., 2018), because it is a refugee crisis that is still going on. There is also one related to a war situation, however as there is a lot of debate on how to consider a war situation - if it is a man-made disaster or not definable as disaster- the paper is not classified.

Supported by the paper of Nurmala et al., (2018), it can be concluded that humanitarian collaboration is more common in natural disasters. Indeed, the authors explicitly found that on a sample of 134 partnerships, 79 partnerships aim to respond to natural disasters.

Finally, there are two papers (Scholtens, 2008; Wimelius & Engberg, 2015) that are more related to crisis management and can include both natural or man-made disasters or in general emergencies situation. They are not relevant on the analysis as they consider also different type of events.

Size

Last, but not least, is the size of the disaster. Indeed, as highlight by Thompson, (2010) in the military interventions the scope of actions are completely different if the disaster is a large-scale one.

In addition, the size of a disaster - and the availability of command staff resources - are the most important contingencies for a coordination plan (Steigenberger, 2016). The author states that for large-scale disasters a plan with decentralized coordination is more appropriate while "*for small-scale operations or for complex operations with interorganizational dependencies, stronger centralization is preferable, requiring a well-staffed and well-trained command*". It is interesting how he relates the command aspects to the size of a disaster.

From the literature review process the main finding is that the disasters are generally large-scale one (Adem et al., 2018; Akhtar et al., 2012; John et al., 2018; Moore et al., 2003; Naor et al., 2018; Noori & Weber, 2016; Rodríguez-Espíndola et al., 2018; Steigenberger, 2016; Thompson, 2010; Uddin & Hossain, 2011). In particular, it is interesting that many authors do not explicitly define the disaster as large-scale but describe consequences in terms of people (dead, injured), economic loss or humanitarian aid and infrastructure damages. For example, in the Kashmir earthquake of 2005, the infrastructure (including roads, hospitals, schools, armed forces, and police) where paralyzed. The number of people dead were high (86,000 people) and the injured one (100,000 people), together with thousands of people who were displaced to temporarily shelters. In addition, over US$5.4 billion worth of aid was sent to help the affected region and people (Akhtar et al., 2012). Similarly, in the Guerrero's flood, the estimated damage, shelter and dead number of people and the cost of relief aid are the variable considered (Rodríguez-Espíndola et al., 2018) without considering the infrastructure damage. While in the Mozambique case, Moore et al., (2003) report just the death and displaced rate and the damages on the infrastructure. Finally, John et al., (2018) define the Chennai flood as a large scale event because nearly 40% of the city was under water and the infrastructure and communication system were disrupted.

Consequently, it is frequent to report directly some variables that can make understand in a more objective way the size of the disaster. However, the aim could be reached just if all the authors identify and make available the same data.

4.4.3 Collaboration dimensions

Here are reported the contents about the collaboration dimensions of the *SLR framework*: 18 sections represent the 18 dimensions of the cross-sector collaboration in the HSC.

Actors

The systematic literature review aims to identify which are the categories of actors who mainly collaborate in the HSC.

From the systematic literature review it emerges that the most studied actors, in the HSC collaboration, are the humanitarian organizations.

Some papers deal with how they could coordinate inter sector relationships, just among humanitarian organizations in general (Clarke & Campbell, 2018; Tatham & Houghton, 2011; Uddin & Hossain, 2011).

Some other authors describe inter-sector collaboration, but they focus on the difference between humanitarian organizations according to a geographical dimension: they can be at a national or international level. For example, Moore, Daniel, & Eng (2003) report a case of collaboration between national and international NGOs while Adem, Childerhouse, Egbelakin, & Wang (2018) differentiate between international and locally based NGOs.

In general, these collaborations can be classified as INGO-LNGO in light of the HOs' classification by Lu & Xu (2015). Indeed, the authors categorize three NGOs according to their localization degree and their relationship with the government: international NGOs (INGOs), government organized NGOs (GONGOs) and civil NGOs (CNGOs). The first are the NGOs that come to the disaster areas from foreign countries and their role is becoming more important for their capacity to deal with development matters (like poverty alleviation, sustainable development and human rights). The GONGOs are official organizations who are active in social welfare and public affairs, having often a relationship with governments, and they are generally developed by a government or one of its agencies. Finally, the third category is NGOs that are local and traditional with a key role in self-aid and long-term reconstruction.

The sample analyzed includes many papers regarding collaboration between humanitarian organization and the government.

Some of them analyze a governmental institution who coordinates the collaboration among the NGOs (Moore et al., 2003; Rodríguez-Espíndola, Albores, & Brewster, 2018); while others describe NGOs coordinating each other and with the host government itself (Akhtar et al., 2012; Luna, 2001).

Xu, Xu, Lu, & Wang (2018) clearly defined the government-NGO relationship while other authors do not state clearly they are referring to a NGO-government relationship but just mention the involvement of both NGOs and government (Curtis, 2015; Martin et al., 2016; Stephenson, 2005)

Another important class of actors who collaborates with the humanitarian organization is the private sector. (David Swanson & Smith, 2013; Heaslip & Barber, 2014a; Li, Zhang, Cao, Liu, & Qu, 2019; Nurmala, de Leeuw, & Dullaert, 2017).

Maon, Lindgreen and Vanhamme (2009) identify four possible relationship between business corporations and relief agencies depending on the number of actors involved and the type of relationship: single organization philanthropic or integrative and multiple organization philanthropic or integrative partnerships. There is also another classification of private-

humanitarian relations; it distinguished among dyadic and multiple collaborations. The sample considered in the paper is composed mainly by dyadic relations (97%) (Nurmala et al., 2018).

Regarding the businesses, a very common research area is the challenges and issues that can arise from their involvement in the humanitarian sector. In particular, some authors remark general issues related to private-humanitarian partnership without a reference to single studies case or specific actors (David Swanson & Smith, 2013; Li et al., 2019; Nurmala et al., 2017, 2018); while other focus on the relation between logistic service providers and humanitarian organizations (Bealt et al., 2016; Falagara Sigala & Wakolbinger, 2019; Vega & Roussat, 2015). The papers selected include also the description of a specific case of collaboration between private sector and humanitarian organizations about malaria epidemy in Uganda. (Carland, Goentzel, & Montibeller, 2018).

In the literature it is common the investigation of the so-called civilian-military collaboration. However, it should be underlined that none of the authors in the literature review clearly define the term *civil-military*.

Heaslip, Sharif, and Althonayan (2012) face this type of collaboration in general, without a focus on a single case or on specific actors; while other authors (Naor, Dey, Goldstein, & Rosen, 2018; Thompson, 2010) deal with civil-military collaboration trough specific case studies of coordination between many actors: militaries, governmental institutions, humanitarian organization and media. It may be possible to conclude that *civil-military collaboration* is used as a broad term to refer to all the collaborations which involve militaries and other no military actors such as local community, humanitarian organizations, media, government and private sector. In this perspective, it is possible to include in the category also the case described by Heaslip et al., (2012). Indeed, the authors do not indicate specifically as civil-military because the collaboration is between military, NGOs, logistic firms and citizens.

In the end, some of the papers selected do not focus the attention on a dyadic relationship, but they describe the general involvement of different types of actors who participate in the humanitarian relief: global and local NGO, local community, local media, host government, public authorities and military (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2010; Naor et al., 2018; Noori & Weber, 2016; Octavia, Halim, Gede, Widyadana, & Palit, 2016).

In the chapter 4.3.2 Collaboration Dimensions it has been reported only the implicit and explicit information about the categories of the actor involved in the collaborations. However, it is necessary to specify that often the papers miss precise information about the actors of the collaboration. Sometimes it is neither possible to identify which are the categories of the actors involved (Dubey, Altay, & Blome, 2017; John, Gurumurthy, Soni, & Jain, 2018).

In some cases, the authors report just the name of the organizations involved: for example, Thompson, (2010) quotes the military departments' name. Nevertheless, detailed information such as the sector of the company, the size of the organization or other specific features are rarely

provided, even if the authors refer to a specific case study, some examples are Akhtar et al. (2012; Naor et al. (2018).

In addition, the number of actors is provided in few cases (Naor et al., 2018; Prasanna & Haavisto, 2018). This is an important gap because this number strongly affects the collaboration and it is not possible to establish the cause of this lack: is it due to a lack of accuracy reporting the information or to a lack of clarity in the real situation?

Finally, another framework's aim is the identification of possible role played in the supply chain by the actors in the collaboration. However, few of the case studies report explicitly this data, revealing a gap in the existing literature. Just Prasanna & Haavisto (2018) focus on the supplier-buyer relationship in the humanitarian context and they identify four possible categories linking the role within the supply chain (supplier or customer) and the type of actor (commercial and humanitarian). It identifies four categories humanitarian supplier, commercial supplier, humanitarian buyer and commercial buyer) and describes their differences from an organizational cultural point of view.

Also Vega & Roussat (2015) report a roles' classification identifying three main categories for the logistic service providers: the LSP are *member* when it is not systematically present in the HSC and it has not a clear positioning, it participates trough in- kind donations or cash just for a CSR motivation; the *tool* and the *operator* are related to usage of LSP for their expertise in operational logistics activities (like transport or warehousing) or for specific tasks and services that can vary in degree of specialization. Thirdly, the *actors* are proactive players that offer all kinds of logistic services: they design, coordinate and implement the operations through the different phases. These LSPs can perform different activities like decision makers, reinforcing the capacity, helping government in the preparedness, providing best practices; and different sub-categories of this role are presented (coordinator, cooperation, intermediary, last resort or infomediary). The generalization of this classification results very difficult as it is strongly linked to LSPs activities, practices and context-specific aspects. However, the differentiation of roles based on the activities performed and their proactive or reactive perspective, can be a possible topic to develop further research.

Type and scope

These dimensions have been identified as one of the major gaps in the collaboration about the humanitarian supply chain literature. Indeed, it is difficult to classify the collaborations selected in the systematic literature review according to type and scope variables and in general to find information about the structure of the supply chain of the collaboration. There are several reasons of this.

Firstly, when the paper refers to a specific disaster, sometimes it is not clear in which stage of the supply chain is positioned each actor neither the reciprocal relationships among the different actors involved: if they are working at the same stage of the supply chain or at different ones. In addition, it is not possible neither to classify the scope: often the papers do not select a focal company to describe the collaboration and consequently it is difficult to understand if the relationship is

upstream or downstream. (Akhtar et al., 2012; Heaslip et al., 2012; John et al., 2018; Luna, 2001; Martin et al., 2016; Moore et al., 2003; Noori & Weber, 2016; Octavia et al., 2016; Steigenberger, 2016; Thompson, 2010; Xu et al., 2018)

In addition, many papers are general analysis of the collaboration in the humanitarian supply chain, aggregating information extracted from many cases of study. It is rare to have the same scope and direction in different disasters and, as a result, the scholars neglect the scope and type characteristics. This information is related just to the field of the paper itself which is never about these two dimensions. (Balcik et al., 2010; Bealt et al., 2016; Coles et al., 2016; Curtis, 2015; Dubey et al., 2017; Falagara Sigala & Wakolbinger, 2019; Heaslip & Barber, 2014; Li et al., 2019; Maon et al., 2009; Nurmala et al., 2017; Rodríguez-Espíndola et al., 2018; Stephenson, 2005; Tatham et al., 2017; Vega & Roussat, 2015)

Just Nurmala et al. (2018) report explicit information about the type: his research shows that among 134 partnerships analyzed , only 68 establish vertical coordination. Indeed, the private company provides supplies and the humanitarian organization acts as distributor of the products to the beneficiaries. While 29 partnerships focus on horizontal coordination between business corporations and humanitarian organizations, meaning that they both are involved in inventory management and transportation of products or services. In addition, 37 partnerships focus on both vertical and horizontal collaboration. In these partnerships, businesses procure a combination of resources (financial contributions or products), making the relationship a vertical one; meanwhile they are also collaborating with the humanitarian organizations in inventory management and transportation, resulting in a horizontal collaboration.

Balcik et al. (2010) links the type with the actors involved, he states that the military has historically cooperated horizontally with relief agencies because they are coordinating airlifts, sharing storage facilities, providing logistics assets (e.g., maritime resources), providing information on infrastructure and security, and setting up communication networks.

In some other cases, instead, even if there is not an explicit mention to the type and the direction of the partnership, it is possible to label the collaboration analyzing the information available in the text.

For example, Naor et al., (2018) describe a collaboration that can be defined horizontal because they are different organizations collaborating at the same stage of the supply chain in the same sector, in particular it reports the collaboration among different FFH who support medical assistance during Haiti relief.

Another example of horizontal collaboration is the clusters framework described by Clarke & Campbell (2018): they are groups of organizations working in the same sector who are coordinating their efforts in the disaster relief.

In the paper of Carland, Goentzel, and Montibeller (2018), even if the actors involved are many, it is very clear which is the stage of the supply chain they are in charge of: the collaboration

includes manufacturers, distributers and retailers. So, we could define this Uganda's collaboration as vertical.

Prasanna & Haavisto (2018) study the relation between suppliers and customers so it could be definitely considered as an example of vertical collaboration.

In contrast, Adem, Childerhouse, Egbelakin, & Wang (2018) define their collaboration as vertical, anyway the information provided in the case does not allow to verify if the term "*vertical*" is used with the same meaning of this paper.

Also, Xu, Xu, Lu, & Wang (2018) refers to vertical and horizontal dimensions of the collaboration but their dimensions are related to a network perspective not to the supply chain one. They measure the horizontal development as the collaborative width of the network they have created, and the longitudinal development as the collaborative depth of the network.

Finally, regarding the scope dimension, nobody states explicitly if the collaboration can be defined towards the suppliers or towards the customers. In addition, just few papers focus the attention on a focal company, so it has been collected poor data about this dimension. The only example is the paper of Prasanna & Haavisto (2018) focus his attention on an upstream collaboration because they describe a buyer-supplier relation: they take the humanitarian organization perspective, who, acting as buyer, should establish a relation with the suppliers.

Motivations

As highlighted in the definition of this dimension, the main distinction lies in the priority: whereas economic incentives are imperative to business actors' behavior, they are only secondary for humanitarian actors. The two opposite missions have a mandatory influence on all the other components of the supply chain (Natarajarathinam, Capar, & Narayanan, 2009). For this reason, in the literature review process the findings are classified in two different categories: the motivations of the *for-profit firms* and the ones of the *not for profit actors*. In this last category can be included humanitarian agencies, governments and military; however, mainly the results are related to humanitarian organizations.

For-profit companies

It is the most interesting category because a spontaneous question arises: why should top-brand and successful companies be interested in collaborating in a very complex, uncertain and unsafe environment?

The first answer, from a business perspective is obviously to obtain higher *profits* and market shares. Indeed, humanitarian relief is a multi- billion-dollar market and to satisfy the large quantities of goods demanded during major disasters, relief organizations engage in various commercial relationships with private companies (Balcik et al., 2010). Also from the perspective of LSPs the relief logistics is a business opportunity and they can play a preeminent role in humanitarian supply chains (Vega & Roussat, 2015). However, this motivation exists but it is not the main: few studies analyze this motivation and it is not clear why it is not a common reason of

involvement. Maybe (but not explicit evidence has been found) the risks related to the humanitarian filed, the products requirements, the uncertainty in the demand and other factors make the relief market difficult and less attractive.

Another business-related motivation is the fact that the involvement in the disaster response can be a way to "*start operations in the country or region*". In the results of Bealt, Fernández Barrera, & Mansouri, (2016) just 8% of LSPs select this reason; it seems just a niche phenomenon for now.

Similarly, some scholars report that companies get involved in the collaboration to protect their *long-term business interests*. According to Maon, Lindgreen, Vanhamme,(2009) for specific industries like delivery companies, or in general for corporations operating in uncertain or unstable regions, it is essential to obtain more efficient relief efforts in order to enhance long-term business interests. Indeed, strong efforts improve the efficiency of transit hubs in disaster areas and increase the speed of recovery after the stroke of a disasters. In addition to this, investing in preparedness could reduce the future impacts of a disaster, with less damages for the companies and the economy itself. Also Nurmala et al., (2017) highlights how natural disasters can "*negatively impact productivity, growth and welfare of societies to which their customers belong*". As a result, the potential business loss caused by disasters justifies the investments (in terms of efforts or contributions) of the private firms to minimize the negative impacts.

Nevertheless, non-economic reasons lead the private firms. First of all, the increasingly common motivation is the so-called *Corporate Social Responsibility*[15] (CSR). The businesses are under pressure to deliver benefits beyond profit to customers or society and the disaster relief field can be a way to demonstrate their CSR policies (Nurmala et al., 2017). Indeed, saving lives and decreasing human suffering are consistent with social responsibility (Li et al., 2019). It's a request from the shareholders themselves to spend money, time and effort on social causes and to be aware of the company's social impacts.

According to Falagara Sigala & Wakolbinger (2019) this is enough to motivate the LSPs involvement in the HSC. Added to that, Maon; Lindgreen; Vanhamme, (2009) underline that "*sharing supply chain and logistics expertise, technology, and infrastructure with relief agencies could be a way to demonstrate their good corporate citizenship",* and also Balcik et al., (2010) quote this motivation for the philanthropic involvement. Focusing on LSPs collaboration, from the interviews of Bealt et al., (2016) the 26% of respondents remark the CSR motivation as a first motivation; although according to Vega & Roussat, (2015) the nature of the commitment can be the reason why the role of LSPs has not been explored very much in the literature. Indeed, the CSR commitment has some drawbacks: it can be subjected to market trends, the CSR department often has not strategic vision and power; finally, even if it is desirable the growth of private engagement, it could be very risky: if the number of companies involved increases too much, the CSR benefits decrease and the attractiveness of the humanitarian context decreases (Binder and Witte, 2007).

[15] *European commission, "The responsibility of enterprises for their impacts on society and outlines what an enterprise should do to meet that responsibility." access on the internet on 12/1/2020 extracted by https://cscmp.org/*

However, this type of challenges and issues are not highlighted by any authors in the literature review but just by practitioners of the field.

Secondly, very linked to CSR commitment is the *brand motivation*. Exactly it deals with brand visibility and reputation of the company: "*It's reputation management, positive impact on brand visibility and reputation management it is very positive with our brand image when we are associated with NGOs. It helps us to gain strategic customers*"(Falagara Sigala & Wakolbinger, 2019). Indeed, firm association with HOs and disaster create good reputation and positive image among the costumers. Therefore, in line with Falagara Sigala & Wakolbinger, (2019) the international logistic providers are pushed to engage in the response phase: in this stage the media attention is higher compared to all the other phases and the effects on companies' reputation are stronger. Other authors (Balcik et al., 2010; Bealt et al., 2016; Maon et al., 2009; Nurmala et al., 2017) mention the reputation and brand visibility as a very common motivation.

Another thing to consider is the *staff motivation*: it refers either to increase the company's appeal to new talent, or to keep existing staff on board, reducing staff turnover. If the company is an active 'corporate citizen', it enhances staff morale and staff identification with the company (Warhurst, 2006). Three papers identify this reason (Balcik et al., 2010; Maon et al., 2009; Nurmala et al., 2017); while Falagara Sigala & Wakolbinger, (2019) add also that the participation of the LSPs in the relief disasters operations permit to the companies' employees the development of skills that normally they wouldn't have developed in traditional business environment (for example leadership during emergencies).

Connected to this last point, is the possibility for the companies to learn from the humanitarian agencies. Often this is just a benefit obtained from the collaboration, however sometimes it is more a strategic reason: companies who are in extreme uncertain environments need to adapt and be agile if they want to maintain their competitiveness and profitability (Nurmala et al., 2017). Because of this, the companies can learn from the HOs who are accustomed to deal with high levels of uncertainty (Nurmala et al., 2017). Also Maon;Lindgreen;Vanhamme, (2009) remark how the "*agility, flexibility, and rapid response capabilities of disaster relief supply chains should offer key lessons for corporations that increasingly need such skills*".

Obviously if the firms create partnerships with local humanitarian agencies, it is possible to get access to the humanitarians' well-established networks with key stakeholders like military and local governments (Nurmala et al., 2017).

This and other reasons are some additional motivations that are listed by few authors. For example, the improvement of risk management (Maon et al., 2009)

It should be underlined that in the sample analysed only one author (Falagara Sigala & Wakolbinger, 2019) reports and differentiates the motivations based on the disaster phase. Given the relevance of the phases' dimension it could be very interesting to add it: maybe the motivation can change not only depending on the type of actor but also across the time. This gap should be more deeply studied and analysed. Another consideration is that the scholars do not analyse if the

motivation of the beginning changes across the partnership itself. Maybe is just because the initial reasons are maintained during the entire relationship lifecycle; it could represent a future research area. Finally, there are no findings about the reasons to end a partnership looking from the perspective of the private sector. It should be an interesting analysis to point out which among the above motivations are the more reliable.

Not for profit organizations:

The not for profit organizations seems willing to initiate the relationship just to have a more efficient supply chain. However, there are companies that do not care about humanitarian principles and challenges about the independence of the HOs can create also a sort of barriers. Consequently, it is important to understand which are the reasons that lead the NGOs to start a collaboration.

Firstly, the more common situation is to get *access to a variety of resources or increase the available capacity of them*. Indeed, the interviews of Bealt et al., (2016) reveal how the HOs get involved with LSPs who have acquired resources such as "*transportation methods, global storage facilities, technology that supports their operations and staff"*. These resources are crucial in the disaster relief to increase the efficiency of responses. Many authors (John et al., 2018; Lu & Xu, 2015; Moore et al., 2003; Stephenson, 2005) mention the resources access as an important reasons. Especially the findings of Coles, Zhang, & Zhuang, (2016) point out how the need of resources – together with random chance – are the primary motivations for about 70% of the partnership analysed. In addition, even in the collaborations with military actors, from the humanitarian perspective, the main argument to start the relation is the military's availability and the resources they bring (Thompson, 2010). Finally, if the resources are owned but are not enough, additional capacity can be another motivation: for example, the creation of the INGC in the Mozambique floods was driven by the access to third-party capacity: the partners of the government were some private companies who were expected to provide the capacity for any future emergency (Moore et al., 2003). Also, in the civil-military context, the military groups offer to the local organizations capacity in terms of transport, security, logistic or planning for little or no expense (Heaslip et al., 2012). In addition to that the additional capacity and the usage of third-parties allows HOs to "*scale up humanitarian response*" (Falagara Sigala & Wakolbinger, 2019).

Secondly many authors highlight the possibility to *learn* from the business or to use their *expertise* as primary motivations. Indeed, through a partnership it is easy to share experiences and knowledge, for example the logistics operations ones (Bealt et al., 2016). According to Nurmala, de Vries, & de Leeuw, (2018) humanitarian organisations can exploit more into the logistics expertise and capabilities of the private sector. Especially what can be learnt from the business sector is a lot: quality, productivity and efficiency, but also how to improve the effectiveness of their distribution network, inventory management and technology. In addition, collaboration could enhance HOs agility (this strategy is well-known in the business environment); this is a way to increase the flexibility and reliability of humanitarian relief chains (Nurmala et al., 2017). In addition, collaboration with LSPs, increases HOs expertise that is something the HOs do not have

or that it is "*costly to have in-house*"; in particular, the specific knowledge about logistics, customs and infrastructure of destination countries. All of this can be a driving force for HOs to acquire the expertise of LSPs (Falagara Sigala & Wakolbinger, 2019). It is interesting that also in the military context, the HOs can exploit the project capabilities, logistic planning or engineering and security capabilities of the partner (Thompson, 2010). Finally, even if the motivations exposed by Stephenson, (2005) are the ones for the network itself, it seems clear they are the same of collaboration generally speaking. The author reports that it should be an inter-organizational network aimed at creating and sharing knowledge, diffusing it to the participants itself. Even if it is not explicitly underlined as an expertise motivation and in a collaboration among NGOs, the findings of Lu & Xu, (2015) can be brought back to it. Indeed, the authors remark that a single NGO is unable to complete all the disasters recovery tasks and only through the collaboration with other NGOs it is possible to be successful. The strengths, the weakness and the knowledge of each organisation can be complementary to produce a good final result.

Because of the usage of third-parties expertise it is possible for the HOs to focus on their core business competency. However, this motivation, that it is even more strategic than the previous one, is highlighted just by Falagara Sigala & Wakolbinger, (2019).

Another general category of motivation is the minimization of costs and maximization of benefits or the increment of efficiencies and effectiveness. It is a wide explanation that maybe could be better detailed. For example the work of Akhtar, Marr, & Garnevska,(2012) explains how the different actors work together for an "*effective and efficient response to the disaster*". This can be realized through the minimisation of different costs (including transportation costs, inventory holding costs, distribution costs, and administration costs) and maximization of benefits for the people affected by the earthquake. Other scholars (Moore et al., 2003; Stephenson, 2005; Uddin & Hossain, 2011) identify the maximisation of collective effectiveness as a driving reason, but in a very general way.

A more precise motivation is the one selected by Falagara Sigala & Wakolbinger, (2019): the usage of outsourcing permits to reduce the "*capital investment in facilities, equipment, information technology and manpower*". It is a key driver for the humanitarian organisation due to the limited resources they have available and the dependency on donor funds. However, before them, nobody identified this motivation.

Another thing to be considered is the trend of donors to demand professionalization of humanitarian sector and more transparency on the targeted beneficiaries. It is possible that the motivation for collaborate with the business word is a pressure directly by the donors (Nurmala et al., 2017). Especially if we consider the increasing dependency from corporate and individual private donations. This motivation is not analysed in the literature, maybe because it is not relevant or maybe because it is not possible to identify it so clearly.

Some few other motivations are presented in the sample analysed: the decrease of overlapping services (Coles et al., 2016); the possibility, in particular in the recovery stage, to invest and support the local companies in order to enhance the sustainability of that region (Falagara Sigala

& Wakolbinger, 2019); the possibility to bring together participants that may have little interaction (Prizzia, 2012); and finally the incentive directly from the government who tries to push a collaboration (Xu et al., 2018). Nevertheless, on the one hand all these reasons can be very context specific without a real general meaning, on the other hand they represent a gap in the state of the art.

There is another important topic to consider: the reason why not-for profit organisations end a partnership. Just two scholars deal with it, firstly in the civil-military context where the relationship with the military ends as planned (Heaslip et al., 2012). Secondly, according to Coles et al., (2016) even seven motivations exist: end of joint project, end of need, partner leaving, agency leaving, poor quality, lack of time, end of grant and the partnership has been merged. They are listed in order of frequency and the firsts two are very common. No additional explanations or comments are presented. However, it can be identified a lack in the literature about this last field: why are there so few studies that highlight the reasons under the end of a relation?

Duration

As stated in the definition of the framework 4.3 Definition of the SLR framework, it seems important to collect information about the duration's dimension because it affects the nature and the other variables of the collaboration itself.

Anyway, the literature review shows that most of the papers selected do not focus on the time horizon of the collaboration. This result is confirmed by the research of Nurmala et al., (2018). They perform a content analysis on news, press releases, and reports for announcements of humanitarian–business partnerships in managing humanitarian logistics and out of their total sample of 437 announcements, 276 observations of partnerships do not give sufficient information about the duration of partnerships.

Furthermore, some cases of studies just focus on a single disaster relief and they report the lasting of the relief operations. In these cases, it seems reasonable the assumption that the lasting of the relief operations matches with the lasting of the collaboration because there is no mention to future or past collaborations among the same actors. These type of partnership have been defined by Nurmala, de Vries, & de Leeuw (2018) as ad hoc collaborations.

Other papers, instead, remark that the duration highly impacts on the collaboration.

For example, Prasanna & Haavisto, (2018) classify the relationship buyers-supplier considering the time horizon of the relationship (long-term or short-term relationship). They found out that the limited duration (about three years) obstacles the collaboration because the suppliers are discouraged from making a large investment.

Also Falagara Sigala & Wakolbinger (2019) highlight that the different time horizon perspective of the actors challenges the collaboration. For example, in the response phase, HOs typically look for a short project relationship and so the LSPs tend to privilege other customers who ensure longer relationships. Moreover, in the preparation and recovery phase it seems easier to match HOs and LSPs perspective; this because the HOs are involved in longer term projects to establish

preparedness strategies or to support local economies after a disaster. According to the scholars partnership's duration depends also on the phase and the size of the actors involved: small and medium agencies tend to establish short-term relationships just during response phase because they strongly depend on the donations amount; while bigger enterprises could afford to initiate a long-term relationship already in the preparation phase.

In addition, Coles, Zhang, & Zhuang (2016) studying the collaboration during Joplin and Sandy tornado, describe the correlation between the partnership's lasting of the partnership and other variables related to these relationships (such as the time horizon of the projects or the strategical level). They find out that an agency cannot stabilize or lengthen a partnership by diversifying the number of projects that they are engaged in unless they make a transition to provide long-term services to the community. In addition, they discover that "*partnerships that had shared either only few projects (1 or 2), or all projects, survived longer*" and that "*strategic partnerships tended to end much more quickly than tactical partnerships*." Furthermore, prior experience in disaster operations impact positively on the duration of the relationships.

To distinguish different types of collaboration between private sector and relief organizations Balcik, Beamon, Krejci, Muramatsu, & Ramirez (2010) track the duration of the collaboration: Donation-based relationships are typically short-term, spanning only the disaster relief period, while strategic partnerships are generally long-term. As it could be inferred, in this paper the time horizon of the relationship is linked to the strategic level of the partnership that has been previously analyzed. Maon;Lindgreen;Vanhamme, (2009) agree with this classification: they state that mostly of the philanthropic partnership are short term relationship and they highlight also the existence of long-term private corporation-disaster relief agencies collaborations focusing on long-term impacts.

Finally, the time variable has a key role in the research of (Xu et al., 2018). Indeed, they describe the changes of the collaboration during the two-year reconstruction period of their case of study. In particular studying three collaborative variables (the correlation in the collaboration, the number of bridge projects and the funds, the vertical and horizontal cooperative network) they identify four stages of collaboration (birth, growth, stability, saturation): each of them is characterized by strict time frame and specific features.

Selection criteria

Despite the relevance of the consequences after the choice of the right partner, few authors analyzed in the literature review deal with the criteria used to select the most suitable partner.

Anyway, it was possible to retrieve some information about the criteria used in few specific cases.

For example, Lu & Xu (2015) referring to a GONGO-NGO collaboration, report that the government selection is based on the project plan drafted by the candidate NGO before starting the work.

The partner's selection could depend on the industry of the organizations. This is what happened in the clusters collaboration: clusters are defined as '*groups of humanitarian organizations, both*

UN and non-UN, in each of the main sectors of humanitarian action, e.g. water, health and logistics…' (Clarke & Campbell, 2018) so, the companies who collaborate in the same cluster are from the same industry. In this case, the selection criteria are also one of the main reasons that lead actors to collaborate, they were working jointly because of their belonging to a certain industry.

It seems also that the availability of information about the potential partners could enhance the selection: for example, the distribution platform and the information collection provided by the Ya'an service center allows the governmental authorities to choose the most suitable NGO partners for the governmental projects (Xu et al., 2018).

Some papers, instead, indicate as selection criteria general principles which could be applied in different situation.

For example, Heaslip et al. (2012) provide a complete list of criteria for the military selection of possible humanitarian organizations, and conversely the criteria used by the humanitarian organizations to choose an appropriate military partner before the disaster occurs. Among these criteria the authors identify the extent of means and capabilities of an organization as the most important criteria used by the humanitarian organizations.

Nurmala et al. (2017), instead, deal with the criteria used by the business sector to select the humanitarian partner. Firstly, the businesses recognize the need of a great degree of adaptability to local conditions and of sufficient experience in uncertain situations of HOs. Secondly, business organizations tend to select partnership options that can ensure an employee's security during disaster response activities.

Also the research of Falagara Sigala & Wakolbinger (2019) focuses on the criteria applied to select the most suitable partner during a business-humanitarian collaboration; in particular, they focuses on the outsourcing of logistics activities to private logistics service providers.

Firstly, they underline that HOs select a partner within the existing network of companies in the affected areas, in particular, among the ones who have shared experiences with other HOs. They identify as main criteria for humanitarian organization the LSPs' service and delivery quality. These criteria are related, in practice, to the reliability and responsiveness of providers, on-time delivery, lead time and costs, the compliance with humanitarian ethics, and finally the donor regulations.

An interesting findings is the differentiation of the selection criteria according to the phase in which the collaboration is established: for example Falagara Sigala & Wakolbinger, (2019) report that "*in the preparation phase where speed is not that important, quality and costs are main selection criteria. In the response phase where delivery of services can "save lives," speed is the most important selection criterion*". For this reason, sometimes the selection of partner seems an obvious choice as in the Pakistan earthquake relief when it has been chosen the *12th Aviation Brigade* to help in the relief operations. Indeed, the military group was already in Afghanistan at that time and so it was the actor who could provide the quicker help (Thompson, 2010).

In the recovery phase, instead, many HOs are trying to establish long-term partnerships mainly with local companies. In addition, Falagara Sigala & Wakolbinger, (2019) collect also the selection criteria used by LSPs to choose the suitable HO. Firstly, the authors remark that LSPs are profit oriented and obviously they select partners based on the criterion of profitability. The amount of the activity to be performed cannot represent selection criteria because even if it is larger than their capacity, they can always sub-contract the work. Moreover, LSPs sometimes favor smaller companies because they seem more dynamic and less bureaucratic.

Institutionalization

Even if the dimension seems relevant, the systematic literature review underlines that none of the authors concentrate their analysis specifically on the use of the contracts. Just few of them refer to the formalizations of the partnerships; moreover, the authors who deal with the use of the contract suggest contrasting views of this dimension. Falagara Sigala & Wakolbinger (2019) highlight the strong necessity of additional research on contracts between the humanitarian and logistics to regulate the outsourcing of logistics activities. In particular, they propose to implement in the future researches a framework that will help organizations to decide the parameters to put in place in order to standardize contracts with LSPs.

Moreover, the authors who deal with the use of the contract suggest contrasting views: some authors see the contract as enabler of collaboration and some other as a barrier or a sign of a weak relation

Contracts are considered important to set agreements regarding information sharing, obligations and resources available during the preparation phase, before the phenomenon strikes (Rodríguez-Espíndola, Albores, & Brewster 2018); the agreements could be either based on the trust or written (Heaslip, Sharif, & Althonayan, 2012). Otherwise, sometimes it happens that the pool of actors with whom an agreement has been established before the disaster strikes is deemed insufficient for the situation, and so it would be necessary to set a collaboration without prior agreements.

Indeed, sometimes the relationships among the actors are formalized after an informal initial stage during which the relationship starts; in this case, the use of the contract has been conceived to strengthen and better define the relationship. This is the case of (Xu et al., 2018): they report that some *regulations* based on previous NGO–government collaborations and NGO–NGO collaborations have been developed after an initial stage; the regulations included *contract administration*, project management, supervision and responsibilities. These regulations are considered in a positive way by the authors: they allowed for more detailed and efficient supervision and management of all stakeholders and determined the organizational division of labor.

Also Lu & Xu (2015) point out the benefits of the use of contracts but during the reconstruction phase, not to establish the relationship but to maintain it because collaboration agreements are

considered significant in enhancing mutual trust and rationalizing the inter-organizational relationships for joint NGOs.

However, Stephenson (2005) has an opposite view: he states that if the collaboration among the actors must be secured by a contract it means that the collaboration itself is weak.

Stephenson's opinion could be corroborated by some cases in which the contracts with logistics service providers are used to establish a short-term relationship. For example, Falagara Sigala & Wakolbinger (2019) mention the use of contract with LSPs in regard to the size of HOs: they observe that while big agencies tend to establish long term relationships with LSP, the smaller one have short term relationships based just on contracts. Or when the LSPs act as "*tools*" (2.2.4 Private sector) and provide logistics support to humanitarian actors, their relationship is formalized on a contract base (Vega & Roussat, 2015).

Finally, Balcik et al. (2010) deal with the use of the contracts related to logistic activities: the procurement phase. They mention the use of joint contract in SC industries, but without investigate the implementation of them in HSC field; in particular they stated that in commercial supply chains, buyers in closely related industries can also take advantage of joint contracts, which enable multiple buyers to pool their demand while purchasing the same types of items or buying from the same suppliers; but they don't mention the use of contract in the HSC joint-procurement. To what concerns third-party strategies, they mention the need of use a contract when the third-party is the private sector; this is a challenge for the NGOs because they should allocate to manage the relation. (Balcik et al., 2010)

It could be significant also the contribution of David Swanson & Smith (2013). They assert that to establish a PPP (public-private partnership), it is not necessary the use of a contract; they use this definition*: " ...working arrangements based on a mutual commitment (over and above that implied in any contract) between a public sector organization with any organization outside of the public sector." (Bovaird 2004, 199).*

Activities

Regarding the activities dimension the SLR aims to understand better the information on this variable.

However as stated above, the logistics activities could be classified as *primary* (transportation, inventory management and warehousing) or *secondary* (information technology, human-resources training, and other back-office activities to support logistics) (Nurmala et al., 2018). Here the findings are reported differentiating between these two typologies.

To what concerns the primary activities, a first activity that can be included is the *procurement*. In particular, the most common way to be involved in this activity is through in-kind donations, where the donors contribute to the logistics capacity of humanitarian operations by providing products or services themselves (Nurmala et al., 2018). This is an operational level of collaboration, because it implies that the partners are involved in logistics activities even if they perform these activities

on their own; this involvement usually does not exist when the contributions are just financial (Nurmala et al., 2018).

This engagement happens not just in the procurement, but also in another primary activity, the *pre-positioning:* for example, LSPs can provide trucks of pre-positioned relief items (Bealt et al., 2016).

Anyway, in some situation the involvement of the partners in the activities is greater: the procurement operations themselves could be shared (*collaborative procurement*) among business companies or no profit organizations. In this way, multiple buyers working together can gain synergies in their purchasing activities (Balcik, Beamon, Krejci, Muramatsu, & Ramirez, 2010). This primarily occurs across multiple organizations that are either in the same or related industries (Balcik et al., 2010).

Also the *pre-planning activities* (pre-positioning and relief supply inventory) can benefits by the collaboration in different tasks: the organizations can share data about supply, track the movements of cargo, pool scarce logistics assets (Balcik et al., 2010).

Also to what concerns *transportation* activities the theoretical framework mentions different degrees of collaboration.

The partners can coordinate their activities without performing them together; in fact, warehousing, fleet management and transportation seem to be ones of the most common outsourced activities to LSPs. However, the opinions are contrasting: for example, Bealt et al. (2016) find out that distribution and warehousing should be kept in house; while to what concerns transportation sometimes it is outsourced since there are agreements with different governments that provide warehouses and they have own aircrafts and trucks (Falagara Sigala & Wakolbinger, 2019).

Sometimes the private sector provides services for free: especially transportation both in long and short haul delivery (Balcik et al., 2010), free spaces for warehousing or operating daily activities (Adem, Childerhouse, Egbelakin, & Wang, 2018).

From the literature (Falagara Sigala & Wakolbinger, 2019), it seems possible to outsource other *transportation and stocking activities* such as: stock review of pre-positioned relief items, forecasting, warehousing and controlled temperature storage, intermodal transportation, fleet management, last mile distribution, cross-docking, temperature controlled warehousing, warehousing (which includes storage, receiving, picking and shipping tasks) and labelling. They are commissioned to LSPs both during the preparedness and the response phase. In addition, sometimes the HOs involve the private companies also in the assessment of the needs even if the last mile distribution usually is performed by the HOs themselves (Falagara Sigala & Wakolbinger, 2019). In addition, the authors report that LSPs are involved in the recovery phase for what concerns reverse logistics, reporting, trainings and skills development.

Nonetheless, the actors can collaborate in a greater extent performing these activities: the pooling of scarce transportation resources (e.g. aircraft and trucks) seems to be effective in a variety of disaster relief operations. Also, because sharing transportation resources generally increases local bargaining power for relief organizations (Balcik et al., 2010).

Finally, according to Vega & Roussat (2015) the activities performed by the LSPs can be categorized based on their role and on the phase of the disaster; however, no other evidences of these relation are present in the literature.

As it has been defined before, the collaboration can involve not just directly the logistics activities but also the *supporting activities*: indeed, the business companies can provide IT systems (Bealt et al., 2016; Falagara Sigala & Wakolbinger, 2019; Nurmala et al., 2018) and back office support to improve the logistics functions of humanitarian operations (Nurmala et al., 2017).

Concerning the activities, there are many mentions to the importance of *training*. The training of volunteers and partners enhances mutual trust and it permits to align the collaboration activities to be performed (Lu & Xu, 2015; Xu et al., 2018). The business companies can also train NGOs members, local community and volunteers to minimize the need of activities outsourcing and to make the social community independent (Adem et al., 2018; Lu & Xu, 2015).

Also *planning and information sharing* activities are performed to enhance collaboration, sometimes there are some actors specifically in charge (Heaslip & Barber, 2014; Lu & Xu, 2015; Luna, 2001) of these activities, otherwise they are performed by a specific business unit and the actors share this responsibility (Xu et al., 2018). One of the most common activity performed by one or more actors in a collaboration is the *financing* because the humanitarian operations are not a source of financing by themselves. The fundings could be provided by different types of actors such as PS (Maon et al., 2009; Prasanna & Haavisto, 2018; Nurmala et al., 2017), militaries (Heaslip et al. 2012), governments (Xu et al., 2018), NGOs (Lu & Xu, 2015); If the partners provide just the financial contributions in the relation, usually their contribution in the collaboration is detached and short-term (Maon et al., 2009; Prasanna & Haavisto, 2018; Nurmala et al., 2017).

In conclusion, nobody clearly defines the level of involvement of each actor or their specific roles and responsibilities in performing the activities, this could be useful to clarify how the collaboration concretely takes place and the touch points among the actors. This lack can represent a future research area.

Resources sharing

Regarding the resource sharing dimensions a first findings is that one of the main reasons to begin a humanitarian-business collaboration is to have access to resources impossible to retrieve individually in the HSC context (as described in the Motivations chapter)

In particular, it is possible to group the resources shared in favor of the humanitarian organizations and the ones acquired by the private companies.

Starting with the first group, *skills and expertise* developed in a commercial context are shared to enhance humanitarian operation (Bealt et al., 2016; Nurmala et al., 2017). This could be due to the sharing of the human capital, as in the HO – military collaborations usually happens (Heaslip & Barber, 2014; Thompson, 2010), or to the sharing of the knowledge itself.

In particular, David Swanson & Smith (2013) describe the possibility for humanitarian operators to adapt some supply chain strategies in the humanitarian context, referring to a collaboration based on the *sharing of logistics frameworks* in a private-public partnership. Another example (Balcik et al., 2010) describes the sharing of LSP's *know-how* such as shipment tracking, delivery route optimization, fleet management, outsourcing decision with HOs.

Technologies, also, are commonly shared by the private sector in the humanitarian context (Bealt et al., 2016; Nurmala et al., 2017). For example properly business IT systems are exploited by humanitarian actors and other partners of the collaboration (such as *OneResponse* (Martin et al., 2016) or *HCOP* (Tatham et al., 2017)).

While in the second category, the collaboration with humanitarian operators can provide to the private sector some resources such as the *access to network* of vulnerable people and *knowledge and skills* related to humanitarian operations (Nurmala et al., 2017).

Typically, in the disaster relief, it is common to share the *infrastructures* such as warehouses themselves. This practice is particular significant because undertaking the responsibility of an infrastructure investment could strengthen trust in a long-term relationship (Li et al., 2019).

Another interesting point is that, as stated before in the Activities chapter, one of the main reason to be involved in a partnership, especially with the military, is the sharing of *equipment, asset and facilities*, (Nurmala et al., 2018; Rodríguez-Espíndola et al., 2018; Thompson, 2010). These resources can enable either logistics activities such as *warehousing capacity, transportation vehicles, storage facilities, maps*, etc (Balcik et al., 2010; Rodríguez-Espíndola et al., 2018; Thompson, 2010); procurement activities like *raw-materials and supplies*; or other activities such as *medical supplies* (Naor et al., 2018). During the relief operation also the *skills* of the militaries turned out to be fundamental (Heaslip & Barber, 2014; Thompson, 2010).

The major part of the collaborations need a suitable coordination budget for their activities. (Akhtar et al., 2012). In HSC the relief operations are supported mainly by donations. The donors identified could be either private sector companies, or governments or individuals (Akhtar et al., 2012; Falagara Sigala & Wakolbinger, 2019; Maon et al., 2009; Nurmala et al., 2018; Stephenson, 2005; Vega & Roussat, 2015). Sometimes the actors of the collaboration play just the donor role, sometimes not (Vega & Roussat, 2015). Nonetheless, none of the authors highlights if these funding are just donated to a single actor of the collaboration or if in some cases they shared and pooled them in some ways.

Information sharing

The information could be considered a sub-category of resources sharing, but, as it has been stated in chapter 4.3 Definition of the SLR framework, a chapter has been dedicated to discussing this specific topic due to its relevance.

Many authors underline the importance of information sharing to make collaborations successful (Moore et al., 2003; Nolte & Boenigk, 2011; Pettit & Beresford, 2009). However, in the literature it seems that the only information shares can be included in two main topics: firstly, the one related to the current situation of the affected areas and the relative population's *needs assessments*; secondly the information about *availability assessment*, that means for example *logistics capacity* or *warehousing inventories*. These data are considered a critical success factor for the relief operations (Akhtar et al., 2012), nonetheless, are they the only information that can enhance collaboration and the humanitarian response?

In addition, in the sample analyzed, explicit lists of which information are exchanged between the partners are rare. The reasons of this lack are not clear.

The only example is the paper of Tatham, Spens, & Kovács, (2017) who describe the data that would be collected in an ideal world to give a visual depiction of the affected area. These information are:

- *The type, volume, and location of relief goods required, as well as the places*
- *The type, volume, and location of relief goods available including the usability of the transport infrastructure, such as bridges, ports, railways, and roads.*
- *The availability and mode of transport to the affected area, and the associated planned/scheduled arrivals of relief goods.*
- *Warehouse availability and usage*
- *Transport availability and the means of making 'last-mile' distributions to recipients,*
- *Any special handling requirements*

Nonetheless, instead of describing which information is exchange, the papers highlight a possible linkage with the coordination mechanisms that are implemented in the collaboration. To begin with the communication tools, what can be pointed out is that some platforms are created to exchange information about the available resources and the required needs in order to match them. For example the *Ya'na center* allowed stakeholders to gain access to resources and publicize their requirements, all of which led to the gradual formation of a multi-dimensional communication mechanism (Xu et al., 2018). Another example is the online forum *OneResponse* used during Haiti response, it enables organizations to understand each other's constraints and possible combinations of collaboration (Martin et al., 2016).

Considering the others coordination mechanisms, the exchange of information is still one of the main objectives. For example, the umbrella organization enables the gathering, collecting and disseminating of critical information and data (e.g., *infrastructure assessments and updates, transportation availability and capacity, customs issues, maps*)(Balcik et al., 2010) or the

existence of clusters improves the information exchange about the other organization's activities (Clarke & Campbell, 2018).

In addition, Uddin & Hossain (2011) underline the relation between the network structure and the exchange of information: the more are the number of maintained relationships displayed by an actor the more will be the information-sharing with other actors in the network. It is an interesting finding, but no other evidences are present in the sample analyzed.

Finally, in the literature, the contribution of military to the relief operations seems particularly interesting to gain on time and reliable information about the relief operations, the territory, security, movement of humanitarian convoys and management of shared resources (Heaslip & Barber, 2014; Thompson, 2010). The reason of this can be that the militaries are trained and have professional tools to get this information (Heaslip & Barber, 2014).

Coordination mechanisms

As defined in the theoretical framework chapter (), the findings of this dimension are classified among two main sub-categories: collaboration structure and decision making, and the communication tools.

Collaboration structure and decision making

First of all, as highlighted in the theoretical definition, in a collaboration usually the reciprocal roles of the actors are established. This identification could be synthetized in an organizational structure: the latest highlights the interdependencies among organizations and different type of decision-making.

In the selected papers, the main classification of the organizational structure is proposed by Lu & Xu, (2015). This categorization has been used in a broader way to classify also the organizational structures described in other works of the sample.

Lu & Xu, (2015) define three main types of organizational structures (Figure 4.6, Figure 4.7, Figure 4.8) referring to collaborations implemented during the recovery and reconstruction post-Wenchuan earthquake.

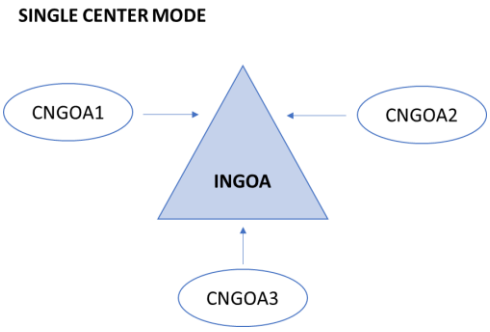

Figure 4.6:Single center mode classification by Lu & Xu, (2015).

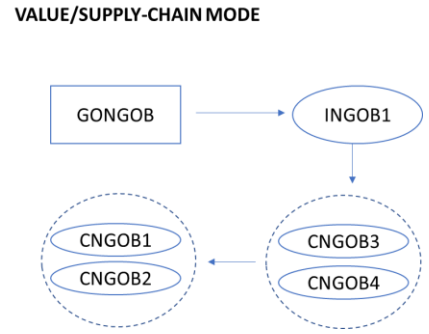

Figure 4.7:value/supply-chain mode classification by Lu & Xu, (2015).

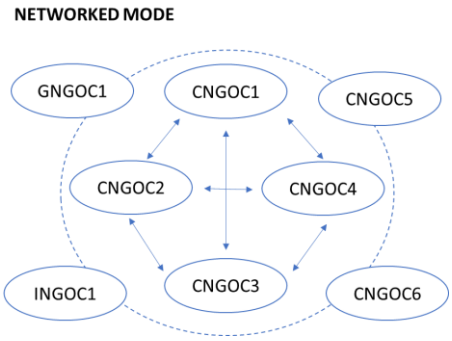

Figure 4.8:Networked mode classification by Lu & Xu, (2015).

The first structure (Figure 4.6) is a *single center mode* (supporting pooled interdependency): there is a central NGOs (here an international one) that is the center of the joint NGOs and it has ultimate control over project design and fund provision, with the other NGOs (here the local one) being the assistants, developing and implementing the aid projects. The second model (Figure 4.7) is the *value/supply-chain mode* (supporting sequential interdependency), in this case there is a primary sponsor of the aid projects, and the different NGOs undertake specific tasks at specific times. Finally, they define the *networked mode (*Figure 4.8) (supporting reciprocal interdependence) suitable in case there are many partners equally in charge of the project. Referring to this last structure, the authors state that "*an interorganizational coordinator is seen to be necessary if many different NGOs collaborate because of their many political, cultural and religious differences, as well as the differences in structure, specialties and scale*."

In addition, it can be deduced that the role of the *interorganizational coordinator* can be classified as the head of a single mode structure; however it is commonly addressed in the literature as the *chain coordinator* which is a key player who is involved in major decision making, leading, and controlling of main coordination activities (Mehta et al., 2003; Akhtar et al.,2010).

It is possible to collect different cases reporting about the presence of a figure which could be classified as an interorganizational coordinator. For example, (Akhtar et al., 2012) review the contributions of the previous authors about chain coordinators and the connotations of this term. They also describe a case of study: during an earthquake in Kashmir country directors and program managers acted as chain coordinators. This last lead and make all major decisions across their own

chain, while strategic coordinators make decisions on evacuation or the prohibition of specific projects and activities. Their decisions are the final ones, and nobody can overrule them.

Also in the work of Rodríguez-Espíndola, Albores, & Brewster (2018) can be recognized a chain coordinator role. The authors refer to the decision-making during disaster situations in Mexico: in this case, it is centralized, there is a coordinating body - *SINAPROC* (Civil Protection National System)- which links the four main organizational branches (executive coordination, technical coordination, technical support and co-responsibility and it aims at using the resources optimally. All these aspects may attribute the SINAPROC body a chain coordinator role.

In the literature it is possible to identify also other types of single center mode coordinators. Balcik, Beamon, Krejci, Muramatsu, & Ramirez (2010) tell about a single lead agency (a coordinating body, inter-agency committee, or an umbrella organization) that creates and/or facilitates an environment for horizontal coordination. For example, the presence of the *umbrella organization* provides a strong incentive for other organizations to voluntarily coordinate because it creates benefits for the entire system. In fact, the umbrella enhances joint procurement, sharing transportation and shared warehousing.

The role of the umbrella organization is commonly used to coordinate the relief operations. Firstly, there is the case of Hawaii: in that region, different institutions act as umbrella organization to respond more efficiently to the disasters in the Asia-Pacific region (Prizzia, 2012). Added to that, during the Mozambique floods in 1999, Moore et al., (2003) describe the development of *INGC* (National Institute for Disaster Management): it has the aim of reorganize the coordination of aid agencies and private sector (which should provide the majority of the logistical capacity) at the provincial and national level during mitigation, preparedness and response. The INGC acts as an umbrella organization (Balcik et al., 2010); anyway it has not been a successful example of this structure because the INGC, at both the national and provincial level, finds itself unable to coordinate or even to monitor the activities of all the NGOs that arrived in Mozambique during the emergency period (Moore et al., 2003). The lack of coordination results in ineffective aid distribution, even leading to situations in which aid recipients are injured or killed in their struggle to obtain food distributed (Balcik et al., 2010).

However, the mere existence of a supporting umbrella organization does not guarantee success. For example, the UN's efforts following the 2004 Asian Tsunami failed to ensure a coordinated response in the international relief community in general. Even if there are resources dedicated to coordination, it is not enough: in the Asian Tsunami the coordination efforts were ineffective because the communication tools and the resources dedicated to the coordination were inadequate (Balcik et al., 2010).

Also John et al. (2018) tells about the failure of a single center mode. In this case of study, a central coordination team is present in order to share information, but a big issue arises: the team does not aggregate and control the data and in the meanwhile, who receives the information consider them

reliable. For this reason, the suggestion is to establish a strong central command for coordinating with various stakeholders during the preparedness stage rather than to form a coordination mechanism when the disaster occurs. (John et al., 2018).

Other findings from the literature review process, is the frequent mention to *clusters*.

Firstly, in 2005 the clusters framework has been formally established as part of the humanitarian reform process initiated by the *Humanitarian Response Review*, and clusters are defined as '*groups of humanitarian organizations, both UN and non-UN, in each of the main sectors of humanitarian action, e.g. water, health and logistics. They are designated by the IASC and have clear responsibilities for coordination*' (Clarke & Campbell, 2018). The functions and the roles of the clusters are clearly defined and they aim to facilitate division of labor, common standards and guidelines, and enhanced partnerships (Balcik et al., 2010).

In addition, it can be identified two different approaches in the implementation of the clusters. In a first phase the organizations within the clusters tend to align their actions and to not duplicate their efforts (and this is the so-called *collaborative approach*); referring to the Lu & Xu, (2015) classification used at the beginning, clusters can be a *networked mode*. While successively the approach tends to be more directive as different organizations participate like subunits of a single (common or joint) program of action (and this is the so-called *top-down approach*). For this reason, it may be deduced that clusters are connected also with the *single center mode structure*: indeed, there is a single entity at the head of a group of organizations. This cluster framework is present in many cases of studies; anyway, the debate about the effectiveness of the clusters is still open. The only result is that by participating in the process, the agencies became more aware of each other's activities, which opened up the possibility for bilateral discussions on preventing gaps and overlaps (Clarke & Campbell, 2018).

Nonetheless, the concept of cluster is a broad term because it has been used not just for the 2005 structures.

For example, Noori & Weber (2016), differently from the Humanitarian Response Review, define coordination clusters as *dynamic structured* formed in response to the escalating series of unexpected events. These clusters can be connected to the *single center mode* structure because most of them contain at least one influential node that plays a crucial role in the execution of the rehabilitation operations.

The organization clusters are there also during the Chennai floods to improve coordination and to have better resources' access (such as aid material, donors, logistics supports, trained volunteers, etc). However, even in this case, the cluster mode fails because not all the organizations have access to these advantages (John et al., 2018).

To what concern the *network structure,* it is possible to notice that many authors study the networks formed during disasters relief as communication and decision-making structure.

According to the nature of the networks it is possible to identify three major types of inter organizational networks: firstly *social networks* which are based primarily on personal and interpersonal relations, then *bureaucratic networks* underpinned by formal agreements, they formally identify roles and coordination mechanisms; and thirdly *proprietary networks* that are relatively formal and they are also founded on some financial or intellectual property rights. Usually the networks in the humanitarian supply chain context include a relatively weak bureaucratic network and a social network of variable strength, because rarely humanitarian organizations are engaged in strongly proprietary ways (Stephenson, 2005).

Facing a similar topic some other authors study the importance of the degree of network centrality that can be defined as "*the number of direct links connecting a node*" (Uddin & Hossain, 2011). On the one hand centralized decision making and coordination allow for strong strategic planning, resource deployment and facilitate the development of a common operational picture; on the other hand a high network centrality potentially allows more flexible and resilient operations strengthening the local efforts and avoiding bottlenecks (Steigenberger, 2016). In addition, the degree of network centrality is calculated in the collaboration with the Ya'na center (Xu et al., 2018) computing the number of collaborative stakeholders and the mean level of collaboration across all stakeholders.

In conclusion, it has been listed all the information about the coordination mechanisms that are present in the literature and area of research or observations arises: firstly is still necessary to further investigate which situations require which type of mechanisms (Nurmala et al., 2017) and which coordination mechanism to regulate the outsourcing to be implemented, especially with a focus on contracts, between the LSPs and Hos (Falagara Sigala & Wakolbinger, 2019).

Standard operating procedures

To what concern the SOP implemented by the actors during the collaboration, the literature allows to collect some of them mentioned in the papers.

Octavia et al., (2016) describes in detail all the standard procedures of reporting among the actors implemented in case of disaster in Indonesia to compute with a simulation model the possible time saving in case of implementation of a platform.

In case of medium-long term partnership it is possible to implement shared standard communication tools and procedures such as standard catalogues that facilitate accurate communications of orders from the field, standardized measurements that recognize the reliability, efficiency, and value of SCM practices. (Maon et al., 2009)

Moreover there are frameworks to analyze and model the collaborations which integrate best practices and supports the standardization of SCM tasks by clarifying roles, responsibilities and definitions (Heaslip et al., 2012)

Communication tools

Many authors have highlighted the importance of communication. It is considered "*the most important method of reacting quickly for effective coordination*" (Long, 1997). But, at the same time, too many systems can lead to incompatibility problems, "*black holes*" in coverage and infrastructure "*support*" failures (Beresford and Rugamba, 1996).

Studying the papers of the sample there are different examples of communication tools to enhance the exchange of information. First of all, the Chinese government has implemented a system to combine NGO and government's efforts (''*Ya'an civil social organization and volunteer service center for earthquake relief*''). It acts firstly as a decision-making structure, but also like a communication tools through the usage of a platform to collect and distribute information. The center ensured that the NGOs are able to identify and promptly respond to any duplication of efforts (Xu et al., 2018).

In the paper of Octavia, Halim, Widyadana, & Palit, (2016), they compute the save of time due to the implementation of a platform or of a joint website where it is possible to exchange information during the response phase. These systems could improve significantly the response time enhancing the coordination of the actors and avoiding the duplication of the relief operations.

Also Martin et al., (2016) dedicate a chapter to review the literature about the communication in the HSC field and they agree about the importance of establishing the most suitable communication tools . Especially, they study the messages exchanged (on an online forum) by the different actors during the Haiti response: even just analyzing these messages it is possible to describe the interrelationships dynamics of the collaboration. In addition, they highlight that "*different mechanisms and venues might enhance or detract from different types of partnering*". E-mails seems suited for coordination efforts, brief text messages seem better for timelier and more reliable news, while meetings seem required for collaboration.

Other researchers focus their attention on innovative and reliable technological tools to exchange information. Such as Tatham, Spens, & Kovács, (2017) who describe the use of the *common operating picture* (*COP*) in the humanitarian context. The COP aims at providing a "*visual depiction of the affected area with a clear indication of the historic, current, and estimated demand, and the associated and planned movement of relief goods by the responding agencies*."

In conclusion, the communication seems to be fundamental in the HSC, the tools used to enable it should be adequate to the different circumstances. Example of them have been provided but from the literature review clear rules about how to choose the one which fit the most don't emerge.

Level

Even if it is recognized the importance of the level of engagement, often in the literature review, no explicit references to it has been made.

In particular, only three case of study explicilty defined the type of partnership (Clarke & Campbell, 2018; Coles et al., 2016; Falagara Sigala & Wakolbinger, 2019).

Firslty it can be identified the main findings for the *operational* level:

Falagara Sigala & Wakolbinger, (2019) describe how often, in LSPs outsourcing, the humanitarian logistics organisations focus more on the tactical rather than strategic level. Indeed, they have funding constraints and this result in short-term relationships with the aim of cost reduction.

It can be surely classified as operational partnership even if the authors define it as tactical . In any case, the not strategic perspective represents, in this case, an important challenges also because they find that both LSPs and HOs desire a strategic outsourcing. It is necessary that organizations work more with donors and other stakeholders to achieve the benefits of strategic outsourcing to increase their competitive advantage.

Studying the New Jersey Hurricane and Joplin Tornado, Coles et al., (2016) report how the percentage of strategic agency partnership (here strategic refers more to a coordination role) is lower than the tactical (the term refers to a level of partnership that we have indicate as operational). And that the different disasters have a different number of strategic partnership: higher is the size and scope of operation, higher is the degree of coordination and consequently a more strategic engagement is required. In addition, they find some interesting linkages with other dimensions: firstly, there is a relation between the number of partners owned by an agency and the level of these relationships. In addition, generally, the partner can be only operational or just a strategic partner but rarely a single partenr is both an operational and strategical one. Another important observation is that agencies that were working in the region before the disaster and those who started working in the region after the disaster but for a very short-time period, have generally a low number of strategic partners and a higher number of operational one. While agencies which arrived after the disaster, and with a longer partnership's duration, have a more complete mix of tactical and strategic partnership. Finally there is a linkage also between the percentage of projects that an agency coordinated with a partner and the type of partnership (tactical or operational). Indeed, a "*higher percentage of tactical partnerships (67 %*) – in this thesis defined as operational- *pertained to all projects that an agency was working on, while only 45 % of strategic partnerships cooperated on all agency project areas*". And from the interviews seems that agencies tend to develop strategic partnerships with agencies with similar focus.

Many papers explicitly refer to *both strategical or operational* partnership.

For example, in the chain coordinators case (Akhtar et al., 2012) both the level are present: strategical collaborations coordinated by the country directors and operational by the logistics managers, project managers, and procurement managers. Indeed, the first are called strategic coordinators and they play a pivotal role in national and international strategic operations because they taking all major decisions across their own chain or about evacuation or about the prohibition of specific projects and activities. While, the second, are the so-called operations coordinators who often perform dyadic-relationships management with suppliers and they constitute formal and informal coordination teams under the direction of strategic coordinators.

Secondly, Balcik et al., (2010), studying the collaboration between LNGO and INGO, point out that the level of engagement may vary depending on the characteristics of the particular disaster relief situation. Furthermore, when the private sector is involved, if the relationship is on a commercial nature, generally it can be considered operational; while in the case of philanthropic the definition of the level is more complex. Indeed, donation-based relationships are typically short-term and on an operational basis, but sometimes the private's company is engaged in a strategic level: the firm shares its expertise and resources to improve relief chain logistics in a more systematic way, the relation is generally long-term, and it involves significant resource commitment and joint planning.

Also Maon;Lindgreen;Vanhamme, (2009) deal with philanthropic and integrative partnerships but they can be considered respectively operational and strategical relationships. Indeed, the first relation focuses on providing goods and services, as well as infrastructure, often with a short-term duration, based on transactional projects; while the second focuses on the longer-term impacts of disaster relief operations where "*corporations and disaster relief agencies make the most of each others' core competencies so that they can deliver assistance more effectively".*

The literature review of Nurmala et al., (2017) remarks the difference between a strategic and operational partnership (here called *ad-hoc*) in function of the duration: the first is a long-term relationship while the second is a short-term one. Finally, it is also interesting that the authors collect five frameworks about humanitarian-business partnership and two over five includes the level of engagement as a distinctive variable.

A point of attention is a further framework developed by Nurmala et al., (2018). Indeed, even if the authors report the framework previously developed where the level of engagement is an important variable, they decide to not add the engagement's level as a differential dimension. The reason of this choice is not explicitly justified, maybe it can be derived from the other dimensions.

Regarding the literature review of Steigenberger, (2016) it is interesting the linkage between the level of engagement and the degree of centralization. Indeed, it seems that a high centralized coordination is generally linked to a more strategic perspective, while a more decentralized perspective shows a loss in the strategic planning.

It is also possible to gather the engagement level: the context, the activities, the decision-making and other factors are clues for a subjective classification of the level. For example the Prasanna & Haavisto, (2018) interviews highlight how some suppliers put strong effort in the collaboration's goals and one of them say "*We work together. We assume that they are a part of our company, and they assume the same – we are part of their organisation*". It is clearly a strategical relationship. Also the Clusters case, studied by Clarke & Campbell, (2018), remarks a type of approach called *directive*: it aims at a coordination where the organisations participate as subunits of a common and joint strategy. Even if this approach has failed in practice, it can be considered a strategical level of engagement. While the research by Xu, Xu, Lu, & Wang, (2018) classifies three level modes: in the reconstruction of the Lushan earthquake it has been implemented a bridged government–NGO relationship (BGNR) where the Ya'an service center was the bridge.

However, a network between all the actors involved has been created; it was organized on three different organizational levels (the top-level service center, the secondary service center and the service stations) and each of them has its activities, roles and objectives that are different; analysing the activities linked to them they could be classified respectively as strategical, tactical and operational level.

Relationship dynamics

As expected, the findings about the relationship dynamics' dimension are few and so this could be considered a gap in the current literature.

However two main topics of analysis related to this dimension can be identified: on one hand some papers focus on the right balance of the relationship (if the actors are equal or one stakeholder dominates the relation) and on the other hand few studies explicitly deal with the costs, rewards or risks of each actor inside the collaboration.

In the first category can be included mainly seven papers (Balcik et al., 2010; Bealt et al., 2016; Clarke & Campbell, 2018; Coles et al., 2016; Noori & Weber, 2016; Vega & Roussat, 2015; Xu et al., 2018). In particular, studying the collaboration between NGO and government in the Lushan earthquake, Xu et al., (2018) point out that the two actors are equal in the collaboration and all the stakeholders have the same influence on objectives, processes, outcomes and evaluations. While from Noori & Weber, (2016) perspective often there is an unbalanced relationship between the global and local actors with regards to resources and accountability; in fact, local organizations tend to be small in capacity and less powerful in technologies and in organizational capabilities.

An interesting finding is the one of Bealt et al., (2016), they observe that the level of mutual benefit depends "*on the flexibility to adapt learn from each other".* In the relation between LSPs and HOs the first generally learn faster and consequently could be that the benefits sharing is unbalanced.

It should be underlined also the work by Balcik et al., (2010). They identified *the risk and reward sharing structure* for a coordination mechanism, and they point out that it can be *fair or unfair*. *Fair* when one partner received benefits commensurate with the risks undertaken, while it is *unfair* if one company takes less risk while enjoying greater benefits compared to the other participants. It is exactly the definition of balance and unbalanced relationship and often, in the scholars' analysis, the coordination mechanisms are *unfair* and the buyer, compared to the supplier, assumes less risks and costs but higher benefits. The authors however don't clearly precise if in the humanitarian context, for the mechanisms that are implemented, the relation is fair or unfair.

Finally Vega & Roussat, (2015) highlight the dependence between the roles of the actors and the level of mutual benefits. Indeed, in a relation where the LSPs have a *member* role, the collaboration is generally balanced: both parties have "*mutual benefits in the form of knowledge transfers, sharing of resources and the broadening of each partner's network*".

The second topic, about the costs, rewards or risks of each actor inside the collaboration is faced by five authors (Balcik et al., 2010; Bealt et al., 2016; Li et al., 2019; Stephenson, 2005; Xu et al., 2018). It is very critical: as Balcik et al., (2010) remark, for a successful relationship it is necessary

to include "*metrics that reflect relative risks and benefits, and enable parties to equitably share those risks and benefits*". The authors also identified that consortium or group-based initiatives facilitate this shared risks and benefits. In addition, dealing with commercial coordination mechanisms, they identify three type of costs: *coordination costs* that are direct costs associated with physical flow and coordination management, *opportunistic risk costs* which result from reduced/lost bargaining power or resource control and *operational risk costs* that are the one associated with unsatisfactory partner performance (like sharing responsibilities or a refusal to adapt to changing environments).

According to Bealt et al., (2016) HOs can obtain some not-economic benefits (improvement in the capabilities, transparency and resource allocation) while LSPs can obtain both direct and indirect economic benefits.

While Stephenson, (2005) summarizes for each role the revenues and incentives as it possible to see from the figure below (Figure 4.9:Humanitarian Relief Network Actors, Revenue Types and Incentives to Cooperate Stephenson (2005)). For example, the UN in a role of "*single year contracts with INGOs and NGOs*" have the following revenues and incentives: *Coordination responsibility via UNOCHA including accountability claims, Information sharing, Shared Mission Claims and Resource Mobilization and alignment.* It is a very interesting findings because is the only one who tries to systematically define the rewards for each actor linking them to the role. However, the revenues and incentives seem very general categories that are not operative or measurable. A more practical and deeper analysis, keeping the author's structure, could enhance the identification of the relationship dynamics in the HSC.

Organization Type	Roles	Revenues and Incentives
United Nations	Single Year Contracts with INGOS and NGOS by specific UN entities- UNHCR, UNICEF etc.	• Coordination responsibility via UNOCHA including accountability claims • Information sharing • Shared Mission Claims • Resource Mobilization and alignment
Donor Governments	• Fiscal Year Donations • Emergency donations to all other network participants	• Accountability Claims • Shared Mission Claims
Ingo's	• Donor Derived Revenues • Shared Mission Claims	• Contracts with UN and donor governments • Information Sharing • Resource Mobilization and alignment
NGOs	• Donor Derived Revenues • Shared Mission Claims	• Contracts with host governments and INGOs • Information Sharing
Host Governments	• Own Source Revenues and donor derived revenues • Shared Mission Claims	• Unique knowledge of political and social landscape • Information sharing

Figure 4.9:Humanitarian Relief Network Actors, Revenue Types and Incentives to Cooperate Stephenson (2005)

Finally a paper (Li et al., 2019) tries to represent with a quantitative model the costs and revenues associated to each actor in a collaboration between private sector and humanitarian organization Figure 4.10). These scholars identify the returns (that can be normal, coordinated and extra) and costs that are present in the interaction. Each partner tries to maximize its own return balancing the returns and costs. It is interesting to focus on the coordinated returns and costs: for the private sector the authors list mainly two main revenues' groups. Firstly the "*direct economic returns, search for new ways for expanding their agility capacities"* and secondly some "*non-economic returns (e.g. brand image, staff motivation, corporate social responsibility, mitigate the negative impact of disasters on business sustainability*)". While the coordinated costs are: *Philanthropic help (e.g. strategic help and donation); Interaction behavior (e.g. manage information, award the contract and attend meeting); Rapid relief supply (e.g. staff salaries, inventory pre-positioning management*). On the other side the HOs mission is not related to profit maximization and the returns are more linked to performance improvements. The difficult task of transforming them in a quantitative way (like financial returns) is a very discussed topic. How can the efficiency enhancement be transformed in a financial return? In the (Li et al., 2019) model they used other previous performance indicators, and they define three main coordinated returns: "*Cash-based donation, strategic-based help; Achieving a more accountable, visible and effective performance by learning the experience of commercial supply chain management; Reducing the risk of relief shortage, improving the capacity of continuous replenishment".* Regarding the costs of the relation just *Interactive behavior* (e.g. *acknowledge HO's culture, method and agenda, attend coordination meeting, award a contract*) is included. The limitation of this model is that a real case implementation seems necessary to increase its reliability. Indeed, how can they know that the listed revenues and costs are the only one for this type of relationship?

Item(s)	Performance measurement	
Returns and costs	*for PS*	*for HO*
Normal returns	A multi-billion-dollar market (Balcik et al., 2010)	Rapid and stable relief supply, high quality of product/service (Nurmala et al., 2017)
Coordinated returns	1. Direct economic returns, search for new ways for expanding their agility capacities (Beamon and Balcik, 2008); 2. Non-economic returns (e.g. brand image, staff motivation, corporate social responsibility, mitigate the negative impact of disasters on business sustainability (Rueede and Kreutzer, 2015; Maon et al. 2009; Van Wassenhove, 2006).	1. Cash-based donation, strategic-based help (Balcik et al., 2010); 2. Achieving a more accountable, visible and effective performance by learning the experience of commercial supply chain management (Oloruntoba and Gray, 2009); 3. Reducing the risk of relief shortage, improving the capacity of continuous replenishment (Nurmala et al., 2017; Balcik et al., 2010).
Extra returns	1. Opportunistic behaviors, such as provide low-quality products, shirk responsibilities and delay in delivery (Xu and Beamon, 2006); 2. "Free rider" problem, which can be explained as spillover returns from player's defection (Yu et al., 2009).	1. Opportunistic behavior, such as unfair price-based competitive bidding, shirks responsibilities and contract broken (Balcik et al., 2010); 2. "Free rider" problem, and it is similar to PS, especially HO with bureaucracy.
Coordinated costs	1. Philanthropic help (e.g. strategic help and donation (Balcik et al., 2010); 2. Interaction behavior (e.g. manage information, award the contract and attend meeting) (Balcik et al., 2010); 3. Rapid relief supply (e.g. staff salaries, inventory pre-positioning management) (Balcik et al., 2010).	Interactive behavior (e.g. acknowledge HO's culture, method and agenda, attend coordination meeting, award a contract (Balcik et al., 2010).

Figure 4.10:Measurement of returns and costs (Li et al., 2019)

Challenges and enablers

Regarding the challenges and enablers dimensions the relative findings are reported in a specific way that is now described and the motivations behind are well described.

Often in the literature review if something that can facilitate a collaboration lacks, this element can be defined as a barrier. So, when a factor is in some situation an enabler and the lack of it represents an obstacle, the two dimensions are discussed together, while other additional drivers and challenges are described independently. In the literature review process, the collaboration analysed is mainly referred to a business-humanitarian relation, however many of the following factors can be generalized for other types of collaboration; when it is necessary a specification of the context or of the actors is presented.

Firstly, as it has been said, the diversity of actors involved in the humanitarian context represents a challenge. In particular, the *different values* or in general the *different culture* that characterized two or more partners can be a frequent reason of conflict. Many authors remark it (Adem et al., 2018; Akhtar et al., 2012; Balcik et al., 2010; Curtis, 2015; Heaslip et al., 2012; Maon et al., 2009; Naor et al., 2018; Nurmala et al., 2017; Prasanna & Haavisto, 2018; Steigenberger, 2016; Thompson, 2010). Especially, NGOs are scared by the possibility to compromise their principles of neutrality and impartiality if they collaborate with business or military (Heaslip et al., 2012; Thompson, 2010) and in general they have differences in working rhythms, culture, missions and individual perspective for example viewing the supply chain management as an individual responsibility (Nurmala et al., 2017).

On the contrary, if there is an organisational *cultural congruence* the collaboration can be facilitate. Indeed, as Prasanna & Haavisto, (2018) highlight the collaboration between humanitarian buyers and humanitarian suppliers is easier due to the similar missions and values. Obviously, a commercial supplier is different from an humanitarian one, but the two partners can show some complementarities facilitating the collaborative relation. Especially, a finding from the interviews of Nolte & Boenigk, (2011) is that if an input factor of collaboration is "*general openness*" that characterized the culture of each partner, it will enhance the partnership. Also, between INGOs and NGOs themselves, it is necessary to create common ideals and values to facilitate a collaboration by consensus (Lu & Xu, 2015). Other scholars describe the cultural congruence as an important driver (Balcik et al., 2010; Curtis, 2015; Thompson, 2010) even if it is not the most common one.

Strictly related to the first challenge is the *difference* of the partners in terms of *priorities*. Indeed, the objectives and mission of the partner can be very different and it can obstacles the creation of a relation (Adem et al., 2018; John et al., 2018; Maon et al., 2009; Prasanna & Haavisto, 2018). This is particularly critical in the case of private-humanitarian relation: companies are driven by profit while HOs aim to save lives (Nurmala et al., 2017); or the military involvement can be challenging as they exploit their resources, personnel or material for humanitarian assistance instead of focusing on their primary mission of preparation for combat (Thompson, 2010). Luna, (2001) points out the inevitable tension between the NGOs who want the government focused on the poor and vulnerable, before the disaster, and the government who is more reactive than preventive avoiding the efforts for a good preparedness. Often it gives priority more to economic growth facilitating projects and initiatives which "*threaten to create disaster or environmental*

havoc in the long run after supplying short term profit". In addition, the priorities are practically transformed in objectives. The lack of them, the not clearness of them or even worse if they are different, can be a concrete barrier (Heaslip et al., 2012; Noori & Weber, 2016). A real case is expressed by one representative of a LNGO: "*the quality is the most important thing for LNGOs, whereas INGOs care about time and cost, then quality*". The priorities and the relative objectives are different (Adem et al., 2018).

A very common factor that hampers a partnership is the low level of staff preparedness for the humanitarian context (Bealt et al., 2016; Heaslip et al., 2012) or the local habits (Adem et al., 2018; Falagara Sigala & Wakolbinger, 2019). Generally speaking, a *lack of experience and competencies* can be considered a third challenge (Balcik et al., 2010; Falagara Sigala & Wakolbinger, 2019; Maon et al., 2009; Moore et al., 2003). For example, in the case of LSPs involvement, the "coordinator" role with all its competencies is essential and the lack of it is still a key issue (Vega & Roussat, 2015). In particular according to Nurmala et al., (2017) the humanitarian organizations prefer not to involve the private sector as "*it takes long to get to know the humanitarian sector – time that a private organization may not have or may not be willing to spend"*. Consequently, the HOs tend to focus on a relation based just on cash donations instead of long-term- and maybe more effective- partnership. Another situation is when the coordination tool is, for example, a platform where it is possible to share data: the shortage of appropriately experienced personnel can determine the failure of the collaboration (Tatham et al., 2017).

Instead in the literature seems that the *experience* of a partner can be a good enabler (Nolte & Boenigk, 2011; Uddin & Hossain, 2011). For example the LNGOs are well accepted by the beneficiaries for their cultural convergence (reaching also hidden refugee communities) and the organizations have the "*local knowledge to facilitate communication with the vulnerable population to identify problems and to accelerate implementations"* (Adem et al., 2018). For this reason, the INGOs tend to collaborate with them. Similarly, the collaboration is facilitated if there is the possibility to exploit the personal networks of the partner (Adem et al., 2018; Nolte & Boenigk, 2011) or its tax and customs exemptions for example (Adem et al., 2018).

Another ordinary issue is related to usage of *different procedures or standards* (Maon et al., 2009; Naor et al., 2018; Tatham et al., 2017). For example, the LSPs uses high standards in the processes and operations, while the HOs are not accostumed to it (Bealt et al., 2016). In particular Balcik et al., (2010) highlight this issue and discuss the possible implementation of standardization (for example a standard label) in a collaborative warehouse or procurement analysing the relative costs and risks. Another concrete case is described by Adem et al., (2018) describing the two different protocols for capacity between the LNGOs and INGOs. In opinion of Luna, (2001) the differences of standars exist also between the donor and the receiving NGOs, causing conflicts on the acceptance of projects. In particular only one author remark the lack of standardization for the performance measurement: each actor evaluate its performance differently making a global assessment of relief operations impossible (Bealt et al., 2016). Similarly lack of formats for the data shared create inefficient communication and coordination (John et al., 2018).

Obviously if standardization exists the cooperation can be easier (John et al., 2018; Nolte & Boenigk, 2011; Tatham et al., 2017).

Another frequent consideration is related to the *lack of information sharing or poor communication*. Indeed, often the partners do not communicate and do not agree about the collaboration outcomes, the tasks to implement together or the ones to achieve separately (Adem et al., 2018). In addition, communication issues can result in poor operations (Rodríguez-Espíndola et al., 2018). Especially, Curtis (2015) deals with misinformation: the presence of it impedes effective coordination. Finally, other authors cite poor communication as an important challenge (Heaslip & Barber, 2014; John et al., 2018; Maon et al., 2009; Moore et al., 2003; Steigenberger, 2016).

Even more common in the literature is the presence of *information sharing* as an enabler (Curtis, 2015; John et al., 2018; Prasanna & Haavisto, 2018; Rodríguez-Espíndola et al., 2018; Tatham et al., 2017). According to Steigenberger, (2016) communication together with cognition is the basis for coordination as it directly affects disaster response performance. In addition, Dubey, Altay, & Blome, (2017) find that information sharing result in a higher transparency: if the actors share data on the available capabilities and resources, it helps everyone to understand each role and responsibilities.

A very common standard procedure that try to solve the last issues, is the coordination meetings: the actors meet face-to-face to share data or in general prepare coordination. However, in the literature some authors view them as a *wastage of time*: some of these meeting are without clear purpose or outcomes (Akhtar et al., 2012; Balcik et al., 2010), in some situation they are too frequent (Balcik et al., 2010; Moore et al., 2003).

However, in other case the main issue was related to the fact that the meetings are held in English without translation in other languages (Akhtar et al., 2012; Balcik et al., 2010), the result is the creation of *language barriers.* Under the same category, there is the issue that maybe local area representatives are not English speakers and this makes difficult to communicate among the beneficiaries and the NGOs staff (Adem et al., 2018; Akhtar et al., 2012; Heaslip & Barber, 2014; Moore et al., 2003).

It should be added that many scholars highlight the *high bureaucracy* that characterized humanitarian operations: often it becomes an obstacles for actors that could be interested in (Adem et al., 2018; Prasanna & Haavisto, 2018) or, for existing collaboration, it can results in high delays and lower efficiency (Curtis, 2015; Luna, 2001; Moore et al., 2003; Steigenberger, 2016).

Considering the enabler, one of the more common in the literature, is the existence of *trust* between the actors involved (Adem et al., 2018; John et al., 2018; Lu & Xu, 2015; Nolte & Boenigk, 2011; Prasanna & Haavisto, 2018; Steigenberger, 2016; Stephenson, 2005; Thompson, 2010). In particular,(Li et al., 2019) distinguishes among three different types of trust that should be implemented during disaster relief: competence-based trust and swift trust that is the form of trust occurring in temporary teams and with time pressure, habit-based trust, that is the accumulated

personal knowledge of prior successful interaction and. The first two typologies should be implemented in a disaster context among first-contact actors, while the third type could enhance the collaboration among actors who have already collaborate. So, they conclude that a long term and stable relationship could enhance mutual trust and consequently the collaboration itself.

Also Dubey et al., (2017) cite trust. The authors argue that information sharing and trust are proportionally related and an increase in behavioral certainty can increase swift trust. The presence of this enabler seems essential for any type of relationship. For this reason, if it is not presented, challenges immediately arise (Adem et al., 2018; Bealt et al., 2016; Heaslip et al., 2012; Nurmala et al., 2017).

Another thing to consider emerged by the literature review, is the presence of *leadership capabilities* or a *structured decision making*. Regarding leadership, it seems it should be adaptive and flexible (Akhtar et al., 2012) but need to be present to oversee and direct the efforts of different individual participants (Rodríguez-Espíndola et al., 2018). While for example Balcik et al., (2010) only sustain that is essential to have a clear picture of the rights, responsibilities of headquarters and members, in addition to the level of central control. According to Nurmala, de Vries, & de Leeuw, (2018) the decision making is expected joint, involving all the partnership's members. They should be on an equal position, favouring joint discussions and process planning. In the case of INGO-LNGOs collaborations, structured decision-making system seems the best solution as it led to "*gradually develop project models in which local partners are the main leader and INGOs are the sponsor"*(Adem et al., 2018). However Lu & Xu (2015) believe that even in NGOs collaboration it is necessary to share the responsibility. In any case clear lines about decision making, control and responsibilities need to be present: *a lack of a structure* can be a challenge (Maon et al., 2009) also because the thinking level of the top and middle management are different (Akhtar et al., 2012). However, inflexible system (like hierarchy) can become an obstacle (Adem et al., 2018). According to Steigenberger (2016) the *lack of a leadership*, especially at the staff level, can create different consequently issues: reactive or paralytic decision-making, poorly coordinated and ineffective action on ground, isolation and duplication of efforts and misplacement of resources. The author argues this lack can be worst in disasters' early stages. In addition, from the literature emerged that *asymmetry of power* can create barriers for coordination (Adem et al., 2018; Thompson, 2010). For example HOs see negatively military who may try to assume full control adopting '*too authoritarian an attitude to the problems of survivors*"(Thompson, 2010).

Another important factor that could become a real challenge in the humanitarian context is the presence of competition: some actors do not want to collaborate with partners that are potential competitors (Maon et al., 2009) . However, some authors report also *competition for media*; indeed, as the HOs are often donation-based they compete each other to reach media coverage. Additional actors can become the new attraction for the media and from the HOs perspective only competitors who reclaim founds (Heaslip et al., 2012; Naor et al., 2018; Stephenson, 2005). In addition, according to Moore et al., (2003) what can happen between INGOs and LNGOs is that

the big INGOs try to hire away trained staff and personnel from the local organizations. Obviously, it makes the INGOs in a negative light from local perspective creating a sort of competition even between them.

Even if strongly related to the level of the partnership, some authors report as collaboration challenge the *low level of commitment* (Adem et al., 2018; Bealt et al., 2016). For example, from the study of Nurmala et al. (2018) seems that private sector wants to be low involved, only through financial contribution and only for natural disaster response: it is a big challenge to convert business position to make it supporting a wider spectrum of activities in their partnerships. In addition, often *lack of strategic perspective* emerged as a similar challenge (Falagara Sigala & Wakolbinger, 2019; Moore et al., 2003). As opposite commitment has a positive impact on collaboration (Dubey et al., 2017; Prasanna & Haavisto, 2018). In opinion of Uddin & Hossain, (2011) it is because the commitment facilitates more communication and cooperation.

Some other less frequent challenges and obstacles are present in the literature: governments restrictions (Adem et al., 2018; Balcik et al., 2010; Luna, 2001; Moore et al., 2003) ; uncertainty in the funds or scarcity of them which causes the impossibility to preparedness relation, lack of strategic partnership or no adequate resources for collaboration (Balcik et al., 2010; Falagara Sigala & Wakolbinger, 2019; Luna, 2001; Nurmala et al., 2017); high costs related to collaboration (Akhtar et al., 2012; Balcik et al., 2010; Bealt et al., 2016); loss of independence of HOs (Moore et al., 2003; Nurmala et al., 2017, 2018) and negative reputation they can have if connected with private business (Heaslip et al., 2012; Nurmala et al., 2018); imposition and pressure from donors (Adem et al., 2018; Falagara Sigala & Wakolbinger, 2019), lack of transparency (Adem et al., 2018; Heaslip et al., 2012), and finally, corruption (John et al., 2018; Luna, 2001) or political tensions (Adem et al., 2018; Carpenter & Grünewald, 2016; Thompson, 2010). Obviously some scholars remarks uncertainty in demand, supply or destinations as factors that make collaboration even more difficult (Balcik et al., 2010; Nurmala et al., 2017; Tatham et al., 2017).

Similarly, there are enablers less frequent but that can be relevant: a high flexibility (Clarke & Campbell, 2018; Noori & Weber, 2016; Prasanna & Haavisto, 2018), a good transparency between the partners, which is especially required by the donors (Balcik et al., 2010; Prasanna & Haavisto, 2018; Thompson, 2010); the presence of mutual respect (Nolte & Boenigk, 2011; Prasanna & Haavisto, 2018) and contracts (John et al., 2018; Rodríguez-Espíndola et al., 2018); the training and preparedness activities (Curtis, 2015; John et al., 2018; Prizzia, 2012; Tatham et al., 2017) and finally, in some cases the government's involvement (Clarke & Campbell, 2018; Luna, 2001). In addition, seems that if the partners have experienced collaboration in the past or they are accustomed to work together, the collaboration is facilitated (Li et al., 2019; Lu & Xu, 2015; Martin et al., 2016; Prizzia, 2012; Stephenson, 2005).

Finally, it is interesting that some authors try to categorize and create a model to summarize the challenges (Adem et al., 2018; John et al., 2018; Nurmala et al., 2017) and the enablers (Adem et al., 2018; Carland et al., 2018; Prasanna & Haavisto, 2018) of humanitarian collaboration. In particular, the frameworks of Adem et al. (2018) is focused on the collaboration between local

and international NGOs, while Prasanna & Haavisto, (2018) try to link the drivers to the actors. However, all of these models do not completely include all the factors found in the literature.

Outcomes

Regarding the outcomes dimension, the literature review process reveals that the variable still needs to be better investigated and standardized. Indeed, Nurmala, de Leeuw, & Dullaert, (2017) find that there is a lack of empirical research and case studies focusing on the outputs and outcomes of humanitarian–business partnerships. So, this dimension remains a key future research area.

Firstly, it will be presented the quantitative outcomes identified in the literature review.

Regarding this category, the most common outcome of a collaboration is the *reduction of costs*. As Balcik, Beamon, Krejci, Muramatsu, & Ramirez, (2010) highlight costs can be reduced through coordination shipments and joint procurement or keeping the inventory closed to disaster-prone areas. Another example is the collaboration between local and international NGOs which permits the INGOs to reduce international staff's costs and to optimize vehicle maintenance and petrol costs (Adem et al., 2018). Many other scholars quote the savings of costs as an important partnership output (David Swanson & Smith, 2013; Falagara Sigala & Wakolbinger, 2019; Heaslip et al., 2012; Maon et al., 2009; Nolte & Boenigk, 2011; Prasanna & Haavisto, 2018).

The second most frequent output is a *better response time*: as humanitarian response required (for its nature) quick operations, the possibility to save and reduce time is one of the main dimension to evaluate partnership success (Nolte & Boenigk, 2011). For example, the joint procurement can be a successful coordination because it reduces the time required by handling customs procedures. While in the simulation of dynamic system model runs by Octavia, Halim, Widyadana, & Palit, (2016), the objective function is to minimize the average response time for emergency response. Obviously, low response time is the main desired outcome of this collaboration model. Three other papers remark this type of output (Adem et al., 2018; Heaslip et al., 2012; Maon et al., 2009).

In addition to that, some scholars described other type of outcome that can be interesting: the possibility to *increase the economic rewards* thanks to collaboration(David Swanson & Smith, 2013) or to measure how much are the *costs of the relation* itself (Nolte & Boenigk, 2011; Xu et al., 2018). According to Xu et al., (2018) even the *number of projects* that have been developed in relation with the partner can be a good indicator. Similarly, the *number of beneficiaries* reached through the project or in general the collaboration can be a comparable measure (Moore et al., 2003; Noori & Weber, 2016). The increase in the *savings of lives* it is obviously very interesting in emergency response (Bealt et al., 2016). Finally, Balcik et al., (2010) discuss the importance of improvement in *inventory turnover* through the shared warehousing collaborations.

Under the qualitative category there are many overall benefits that can be conferred to collaboration. The most frequent is the *increase of efficiency*: collaboration is one way to reach better response performances with less resources (Rodríguez-Espíndola et al., 2018). Many authors underline this specific outcome (Adem et al., 2018; Bealt et al., 2016; Maon et al., 2009; Naor et al., 2018; Nurmala et al., 2017; Tatham et al., 2017; Xu et al., 2018). However, these authors

simply address the increment of efficiency as a possible outcome without providing practical examples of how to concretely measure or describe the improvement of this dimension. Only Bealt et al., (2016) believes that the higher efficiency is due to the knowledge acquired through the collaboration.

Similarly, collaboration can *enhance effectiveness*: many scholars cite it (Adem et al., 2018; Lu & Xu, 2015; Prasanna & Haavisto, 2018; Tatham et al., 2017; Xu et al., 2018); Balcik et al. (2010) underline how the possibility to increase response effectiveness is due to the pooling of scarce transportation resources (like aircraft and trucks) while Nurmala et al., (2017) report a specific case of study. DPDHL and UN OCHA collaborate in order to solve the presence of bottlenecks and unsolicited relief items at airports and thus improved the effectiveness of humanitarian distribution networks.

Related to the previous outcomes, the *decrease in duplications* and gaps can be a good result. Obviously, collaboration based on effective information sharing and with the right roles and responsibilities, can prevent the creation of duplicated activities, resources or efforts (Balcik et al., 2010; Clarke & Campbell, 2018; Tatham et al., 2017). In addition, the partners can get access to *better capabilities and resources* as "*you can see how the partner do it*" (Akhtar et al., 2012; Nolte & Boenigk, 2011) or in general it is possible to *enhance humanitarian capacities* (Maon et al., 2009; Nurmala et al., 2017).

Linked to the challenges faced in the collaboration, a good result is that the relation could *reduce the differences* among the actors as you could see and accept the other. For example, in the case of study of Xu et al., (2018) instead of "*two totally independent participants, the government and the NGOs formed a linked system using the bridged platform, which increased their interactions and reinforced system stability*". It reinforces organizational identity and it permits to understand and accept the other stakeholders' organizational identities. Also in the paper of Clarke & Campbell, (2018) just the participation in the collaboration process permits to become more aware of each other's; the same it is highlighted in the study of Stephenson, (2005). Similarly, it can be considered a good result if the *working environment is more secure*, enhancing future relations (Adem et al., 2018; Xu et al., 2018).

Other less frequent outcomes are: the presence of an *effective communication* (Adem et al., 2018) which can be, as in the case of Xu et al., (2018), the higher common value because it permits the governments and NGOs to be integrated on one platform and with a face-to-face communication; or the *increase in the bargaining power* helping organizations to purchase large quantities at lower prices (Balcik et al., 2010); or even the possibility to *jointly develop or customize the product* (Falagara Sigala & Wakolbinger, 2019; Prasanna & Haavisto, 2018) and in general the *enhancement of innovation* (Maon et al., 2009; Prasanna & Haavisto, 2018). Finally, one of the few concrete example of output is described by Nurmala et al., (2017) when American Red Cross and Abbot Laboratories collaborate and this make it possible to obtain a *better visibility of the supply chain.* Lastly, only one paper (Nolte & Boenigk, 2011) reports as a relevant outcome a *better quality,* however based on their findings many organizations believe it is an essential

indicators for collaborative performances. However, critically analysing these outcomes, some of them could be considered also as enablers (like effective communication). However, the main difference is that, studying the papers these factors seems a result, something that came out from the collaboration after it took place.

Finally, in the sample analysed two additional points should be better analysed. Firstly, the paper of Nolte & Boenigk, (2011) is the only one which differentiates between outcomes and output, trying to precisely categorized just three main outputs (time, quality and costs) and two outcomes (community outcomes and network one). Secondly, there is the work made by Prasanna & Haavisto, (2018): they identify outcomes of collaboration (like product and service delivery with customisation, joint cost-reduction, and occasional joint development of new products or in general innovation) directly linked to the actors and also the level of collaboration . This framework could reveal a possible relation that exists between the outcomes and the level and actors' dimensions; however no additional evidences are present in the literature.

Performance measurements

In the literature review process, for what concerns the performance measurement a first findings regards the performance measurement systems to evaluate partnerships: in the literature they are just two.

Firstly, the evaluation of *Ya'na collaboration center* enables to describe the evolution of the partnership across time. In this evaluation five key indexes are used: the scales measured computing *the number of projects and the amount of funds*; *core stakeholders and network stability indexes* which indicate the stability of the cooperative network among the stakeholders along time, *mean number of lines index* which reflected the number of collaborative stakeholders, and *mean collaborative level index* which reflected the mean level of collaboration across all stakeholders (Xu et al., 2018).

Secondly, Rodríguez-Espíndola, Albores, & Brewster, (2018) build a model to develop a system for emergency preparedness considering the resources of the different actors. To measure the performances of this system they selected *costs* as a resource-based measure of efficiency, *fulfilment rate* to indicate effectiveness and the *fill rate* to measure equity. In the paper is it specified also how to operationally measure them.

In addition to that, the literature frequently reports metrics to evaluate and describe a network and its characteristics. For example, the degree of centrality "*provides information about the organization's (or unit's) position within the network whether it occupies a central or a more peripheral position in the network based on the number of network ties maintained with other members*" (Noori & Weber, 2016). Uddin & Hossain (2011) define two variables to describe network relation: c*onnectedness* which defines the number as well as the nature of the inter-organizational relationships of a particular node, and *tie strength* which defines the strength of a network relationship as a source of coordination of activities. The scholars also study how these network features could influence the effectiveness of the network collaboration in disaster preparedness.

To conclude, despite, as described above, some performance measurement systems are implemented, the literature highlights the need of research about metrics to measure the success of the partnerships (Nurmala et al., 2017). Anyway, the problem sometimes is more radical because the measurement of performances is not a core task of a partnership and it is not common in the HSC to perform a joint evaluations but just some individual ones (Heaslip et al., 2012). Further researches on this, and the existence of relationships with other dimensions, are still necessary.

Risks

This dimension is not deeply investigated by the authors of the sample and just recently some of them add new findings.

In particular, studying the collaboration between HOs and LSPs, it is identified a lack of research and case studies about the risks sharing (Nurmala et al., 2017). However, Falagara Sigala & Wakolbinger, (2019) recently point out a list of the risks for this kind of partnership. According to the authors, HOs, when are collaborating with LSPs, should consider these elements of risks: *capacity* of LSPs and the *quality of services provided, delivery delays, insufficient capacity*, as well as *price and market fluctuations*; in particular these risks are higher if HOs use single source. In addition, the LSPs could not respect the promise to deliver for free services because they may give priority to their commercial agreements (Falagara Sigala & Wakolbinger, 2019). Indeed, obviously being profit-oriented, they prefer to make profit rather than just increase their philanthropic engagement.

In the sample there are also some mathematical models use to describe the costs and reward of a private-public relationship in the humanitarian context, which include a variable of risk for the HO. In particular, Li et al., (2019) try to reduce the risk of relief shortage while Carland, Goentzel, & Montibeller (2018) highlight the lack of the risk value in their model.

In addition to that, the level of risks is considered also to define the level of partnerships established among the organizations during the Haiti disaster relief: for example, if the relation is just about communication this means that the level of risk associated is low while a closer relationship implies a high level of shared risk among collaborators (Martin et al., 2016).

Finally, the cost risks are roughly estimated (in a qualitative way) also in relation with the mechanisms of coordination of the partnerships, nonetheless the authors would require precise metrics to better evaluate them (Balcik et al., 2010).

4.5 Discussion on literature review

4.5.1 Synthesis of the gaps

This table reports the main gaps highlighted by the authors of the papers of the SLR and emerged by a comparison among the definition of the SLR framework and the contents of the SLR performed.

DIMENSION	GAPS
Actors	Lack of evidences about the number of actors involved, details about the features of the actors involved and the role they play in the SC
Type	Lack of information about this variable because it is not clear neither the SC structure nor if there is a focal company
Scope	Lack of information about this variable in the different cases because it is not clear the SC structure of the collaboration and the authors don't explicitly mention it
Motivations	Just two papers mention the motivation of the end of the collaboration Lack of evidences about which are the most common motivations
Time span	Lack of information about the duration of the collaboration in the different cases
Institutionalization	Lack of analysis focused on the use of the contracts
	Need of additional research on contracts (HO – SLP) to regulate the outsourcing of logistics activities. Falagara Sigala & Wakolbinger (2019)
	Lack of research to generalize which agreement in which case
Selection Criteria	Need of more empirical information about selection criteria
	General selection criteria provided just for some categories of actors, need to investigate the others
Activities	Lack of information about the reciprocal actors' responsibilities and roles of each activity
Resources shared	Lack of explicitly referring to the resources shared among the partners
	Lack about how the resources can be allocated and shared and who is responsible of them
	Lack of evidences about the improvement in the consumption of the resources due to collaboration
Information sharing	No explicit lists of which information are exchanged between the partners
Coordination mechanism	It is still necessary to further investigate which situations require which types of mechanisms (Nurmala et al., 2017)
Level	Univocal definition shared by the authors
	Need of further research about which variables affect the level of the collaboration
	Lack of information about this dimension

Relationships dynamics	None in the literature defines directly this
Challenges and driver	A classification of them could help to analyze these elements
Outcomes	Lack of researches focusing on the outputs of the partnerships
	Lack of specific numbers of the outcomes of the cases of study
	Lack of evidences about the relation level and outcome Falagara Sigala & Wakolbinger (2019)
Performance measurement	Need of further research about metrics to measure the success of the partnerships (Nurmala et al., 2017).
	Lack of evidences about the existence of joint evaluation instead of just individual ones
Risks	Very few evidences from the literature about the risks (which are the main risks (common and individual), risk assessment of the collaboration, how is it possible to mitigate them)

Figure 4.11: Table gaps literature review

4.5.2 Discussion on literature review

After the SLR process and the findings' description it is possible to critically discuss on the literature itself. For each dimension it is briefly identify the literature gaps and a critical comment on the possible reasons of these lacks and possible future research on it. The discussion is intentionally summarized and to deeply understand the origin of each gap it is possible to refer to the findings chapter (4.4 Findings on literature review).

Phases and other disasters' dimensions

The **preparedness** phase is a disaster stage whose importance, given by the academic word, has recently increased. However, generally the studies are not focused on how to develop a collaboration in this stage, but in the identification of preparedness practices that are useful in the consequent phases. Different authors develop and report these practices but the lack remains the same: there is the need to study (and develop) real collaborations that focus on improving preparedness rather than response.

The **response** phase is the most studied phase in a humanitarian context because it represents the moment when the challenges arise, and a collaboration can change the effectiveness of disasters operations.

It is interesting the relation between the effectiveness of collaboration in the response and an efficient communication. More practical implications could enhance the importance of this relation. Also, the relation with the location is very interesting to be further analyse and verified. Is it true that the difference between the response's policies depend just on the countries or other elements can explain them?

Finally, a question arises: which is the choice of the most opportune time to establish a collaborative relationship active in the response phase? Some authors believe that it can help to sign prior an agreement in the preparedness phase but which is activated in the response or to establish a structure before because it seems a wasting of time during the few hours of a first response. However, in practice, even if the willingness of practitioners is to set the relationship in a pre-disaster stage, few are the concrete examples. This lack and the reasons behind need to be further investigated: is it only due to a low focus by the academic world or are there related challenges that maybe cannot be overcome in the field?

Regarding the **recovery** phase, the collaboration is less studied, but it reveals the importance of two level of collaboration: within the entities engaged (often NGOs or governments) and between them and the local communities. Further researches are needed to understand if these two levels are independent or a collaboration in general it is possible. In addition, an interesting question is the creation of collaboration for the long-term sustainability of the affected communities. More evidences are required in order to obtain generalizable results.

Finally, few authors study the collaboration across all the disaster phases: it remains an open gap. Indeed, it seems that the disaster phase is a differentiator for many other collaboration's dimensions. Lack on these influences cannot permit to identify systematically which are these dimensions.

Few information about the **location** is generally available, especially its impact on the collaboration represents an existent gap. Maybe it is an important aspect or maybe is just a context element.

It seems that regarding the **cause** of a disaster generally the humanitarian collaboration is more common in natural disasters, the reason of this academic preference represents a gap.

Regarding the **size** a first lack is about the existence of a relation between command aspects in collaboration and the size of a disaster itself. Just one author in the military context explicit this choice, more evidences are needed. In addition, generally, the authors define the disaster size using some variables that can make understand in a more objective way the size of it. A gap is that a clearer standardization is needed to compare objectively all the disasters.

Actors

Regarding the actors dimension a first observation is that the literature does not report the individual characteristics of the actors (such as the name, the sector, the size, the nationality, etc). This could be due to the willingness of protecting sensitive information. Nonetheless, the diversity of the actors is a key element of cross-sector collaboration. For this reason, the collection of more information about each single partner could enhance the comprehension of the individual features. This can help to study how it is possible to combine and better exploit the actors' efforts.

Furthermore, from the literature review it emerges that the main dyadic relations created in the humanitarian field are: HO-HO, HO-militaries, HO-governments, HO-private sector. Anyway, most of the relations in the field involve multiple actors at the same time and so different types of

these relations exist in just one collaboration. In this regard, it could be useful to track how many actors of each type are involved in the collaboration.

Type and Scope

The type and the scope dimensions intend to describe the structure of the supply chain considered. Anyway, it seems that the scope dimension does not fit with this research. To define the scope of a relation it is necessary to assume the perspective of just one organization and to consider singularly the relations with each organization. While the papers of the SLR usually do not specify these elements of the collaboration.

In addition, the majority of the scholars do not explicitly mention if the collaboration is horizontal or vertical. If it can be understandable in the theoretical papers, it is relevant the existence of this lack for the case studies, the reason is that often there is not even a clear supply chain structure. Anyway, it could be interesting to analyse this dimension in some concrete case studies as it seems they are two very different categories of collaboration.

Motivation

The study of the literature allows to build a list of the main motivations which lead different actors to collaborate. From this analysis appears clear that the motivations are different depending on the actor mission (for-profit, no-profit). The authors seem agree about the main motivations, nonetheless some of them emerge just from few papers (for example Falagara Sigala & Wakolbinger, (2019) is the only one who underlines the reduction of the invested capital due to the collaboration). Does it happen because they are unusual reasons to be involved in a partnership or because just few authors investigate the real motivations?

Despite the reasons to enter in a collaboration are extensively analyzed, just two authors focus their attention on the motivations to end a collaboration. It could be interesting to retrieve some data about these motivations as they can be key factors to investigate which is the main reason and what can enhance to hold the partners together.

Time span

The duration of the collaboration is a missing data in the majority of the cases studies. This is a significant gap of the analysis because from the papers which consider this dimension it emerges that the lasting affects the collaboration (Prasanna & Haavisto, (2018), Coles, Zhang, & Zhuang (2016), Balcik et al., (2010), Xu et al., 2018, Falagara Sigala & Wakolbinger 2019, Maon;Lindgreen;Vanhamme, 2009).

In particular, additional data about the duration of the collaboration can be useful to verify the correlation between level and duration of the collaboration, which is identified by some of the authors (Maon;Lindgreen;Vanhamme, 2009, Coles, Zhang, & Zhuang (2016), Balcik, Beamon, Krejci, Muramatsu, & Ramirez (2010)) but still not confirmed.

In addition, just Falagara Sigala & Wakolbinger (2019) have studied the duration of cross-projects collaboration, while it could be very interesting to find out if collaborating in different projects enables or not the collaboration.

Selection criteria

Despite the relevance of the consequences after the choice of the right partner, few authors deal with the criteria used to select the most suitable partner and none of the authors concentrate their research specifically on this topic (Xu et al., 2018, Lu & Xu 2015, Nurmala et al., 2017, Falagara Sigala & Wakolbinger 2019, Heaslip et al. 2012).

So, this entire dimension represents a gap. It is necessary to collect more information to reach consistent conclusions. Anyway, the literature suggests some possible directions for the research.

When selection criteria used in specific case studies are indicated, they seem to be connected to the motivation that lead the actors in the collaboration.

In addition, it is possible to identify a link between the selection criteria used and the actors because the few papers which report general criteria are related to specific categories of actors (Nurmala et al., 2017, Falagara Sigala & Wakolbinger 2019, Heaslip et al. 2012). Nonetheless, the information provided is polarized because it doesn't cover all the types of actors of the HSC. For example, there are no information about government collaborations.

Institutionalization

A fraction of the authors of SLR mentions this dimension and the authors who discuss the institutionalization of the collaboration suggest contrasting views: some authors see the contracts as enablers of collaboration and some other as a barrier or a sign of a weak relation.

Institutionalization is a key future research area that need to be investigated: one hand there is a lack of information about this dimension both from theoretical papers and from case studies, on the other hand the opposite views about the enabler or obstacles are both interesting aspects.

In general, it could be interesting to collect additional information about the use of agreements in the HSC and to try to generalize which type of agreement could be useful according to the actors involved, the level and the time horizon of the collaboration. Indeed, despite the gap, it seems possible to guess that the type of institutionalization depends on the type of actors involved in the collaboration, but this just partially emerges from the literature review.

Falagara Sigala & Wakolbinger (2019) proposes one direction for the research: to implement a framework that will help organizations to decide the parameters to put in place in order to standardize contracts with LSPs to regulate the outsourcing of logistics activities. An application of this framework or a generalization of it can be a useful research area.

Activities

This dimension seems really important to understand the practical configuration of the collaboration.

In the paper sample the activities of the LSP-HO collaborations are described systematically, while in the other cases they are just mentioned; nonetheless, it is possible to obtain a list of the main activities usually performed in the collaboration context.

Anyway, rarely it is expressly mentioned who is the actor responsible of each activity. In addition, even if some insights have been provided by the literature, there is a gap of information about to what extent the performing of the activities is shared or individual. This could be useful to investigate how the collaboration is carried out in practice and the touch points among the actors.

Resources shared

None of the authors concentrate his research on the management of the resources in HSC. Anyway, many papers include spots to deduce which are the resources used during the collaboration.

However, there are not information about the management of the resources: how are they accounted (allocated to just one organization or formally shared)? Does the collaboration improve the consumption of the resources? How in practice these resources can be used in the same period of time by entities that are so different one from the other?

Information sharing

Even if many papers highlight the importance of information sharing (Moore et al., 2003; Nolte & Boenigk, 2011; Pettit & Beresford, 2009), there is just one explicit description of which are the information shared and transferred among the actors. Maybe it happens because the organizations don't intend to share this sensitive data with the academics.

In addition, how practically the information is shared among the actors, who is the "owner" of this information, are all gaps that can be further investigate.

Coordination mechanisms

The papers of the sample report many information about this dimension. There are many types of mechanisms to coordinate the different actors: some of them seem to be widely use in HSC context such as umbrella organization, chain coordinator, different types of networks, clusters. In the chapter Coordination mechanisms it is used the classification of Lu & Xu, (2015) to describe the mechanisms mentioned by different authors to analyse and classify them even if each of them could seem case-specific.

So, it necessary to further investigate which type of mechanism could fit better in the different situations, as highlighted also by Nurmala et al. (2017).

Level

It is not easy to deal with this dimension because even if the authors do not mention it directly, it is possible to collect information about the level. Indeed as described in the Level a strategic relation is when "*the partner is viewed as an extension of their own firm".* This concept can be identified using the information from other variables. For this reason, the level could be the ratio to classify the different types of collaboration considering many dimensions at the same time. But further investigations are needed in this direction; also to discover which are the dimensions which mainly affect the level.

In addition, even if it is mentioned the *strategical level* of the partnership, the literature rarely defines this term. Therefore, sometimes there are inconsistencies between the definition applied in

the literature. For this reason, it is important to try to standardize the use of these terms (*operational, strategical, operational*) among the authors.

Relationships dynamics

None of the authors mention exactly the term *relationship dynamics*. However, it is possible to investigate this dimension combining the information provided about the balance of power of the relationship (explicit or implicit) and the individual rewards, the costs and the risks of the relationship. Nonetheless few papers provide this information, so it seems important to further collect data before reaching any conclusion about.

Challenges and enablers

The challenges and the enablers emerged from the literature review are many. Maybe a useful contribution is the research of a coherent classification of all the elements to better highlight the most critical areas that affect the collaboration.

In addition, some of these elements are strictly related to the other dimensions discussed; so, it could be useful to enrich the other dimensions with the information gained studying the enablers and the challenges.

Outcomes

Crossing the contents of the SLR it is possible to write a list of the main outcomes of the collaboration. Some of them seem to be consolidated and commonly agreed by the authors (cost reduction, better response time, effectiveness increment) and the others are identified just by few authors, so it has to be tested if they are case-specific or general outcomes of the collaboration.

To what concerns the cases studies, it is difficult to compare the outcomes because the majority of them do not provide the specific outcomes' value but they just mention the metric of the improvement. In addition, the definition of the outcomes is not standardized within the sector and so it is difficult to confront them. For example, some authors (Adem, Childerhouse, Egbelakin, & Wang, 2018; Bealt, Fernández Barrera, & Mansouri, 2016; Maon, Lindgreen, & Vanhamme, 2009; Naor, Dey, Goldstein, & Rosen, 2018; Nurmala, de Leeuw, & Dullaert, 2017; Tatham, Spens, & Kovács, 2017; Xu, Xu, Lu, & Wang, 2018) simply address the increase of efficiency as a possible outcome without providing practical examples of how concretely measure or describe the improvement of this dimension.

Therefore, it seems important to carry out some empirical research and case studies focusing on the outcomes of the collaboration. Also Nurmala, de Leeuw, & Dullaert, (2017) confirm the lack of research on this topic .

Finally, Prasanna & Haavisto, (2018) reveal a possible correlation between the outcomes and the level and actors' dimensions; however no additional evidences are present in the literature. This relation should be better investigated to be given for granted.

Performance measurement

From the literature it emerges that even if the collaboration combines the activities and the efforts of many actors, they never try to evaluate their joint efforts together. In general, just few authors describe systems and metrics implemented to evaluate the partnership success. Maybe not enough evidences are collected from the field or the researchers have not still focused their attention on this topic. So, since in the business supply chain a shared performance measurement is indicated as a key element (Mentzer, Min, & Zacharia, 2000), it could be useful to further develop the research in this direction.

Risks

Very few evidences could be identified from the literature about the risks. In general, it could be interesting to collect additional information about the main risks that are present in getting involved in a collaboration (common and individual) and how to measure and mitigate them.

5. Case studies

In this section seven original case studies are reported. They are the empirical information collected through semi-structured interviews and integrated with other sources that will be the sample for the Analysis and discussion chapter. These case studies are about cross-sector collaboration projects in the humanitarian sector. Further details on how the data are retrieved (the interview protocol, the information on the primary data and secondary sources) are present in the 5.1 Data collection and then information for each case study is reported, divided by collaboration dimensions, in the 5.2 Findings.

5.1 Data collection

5.1.1 Semi-structured interview protocol

This is the guide sent before the interview takes place. It is a short version of the interview protocol with the main area investigated, more details about the questions are available in the Appendix 1: Interview protocol. The area of interest and the relative questions are inspired by the knowledge developed through the SLR and the gaps identified in the 4.5.2 paragraph.

A Guide to the Interview

We are particularly interested to investigate the following elements. We will ask you to ask you to think of one or two cross-sector collaboration projects/cases in which you were involved in; in particular it will be asked you about:

- Motivations: what are the reasons that lead to collaboration and the ones of your partners; eventually, what are the motivations of the partnership.
- Actors: who are the actors involved and their roles; how do you select the partners.
- Time span: the duration of the collaboration.
- Institutionalization: Is the collaboration formalized (contract, formal/informal agreement).
- Decision making: is there an authority who is responsible for decisions and conflict resolution.
- Activities: which activities do you perform in the relationship and the partners' ones.
- Resources and information: Which resources do you share; How do you communicate and coordinate with each other (language of communication, meetings, platforms, messages…).
- Outcomes and evaluation: what are the most relevant outcomes of the collaboration (time of response, number of beneficiaries, costs…); how to measure the performances of the relation.
- Enablers and challenges: What can facilitate the collaboration, which are the challenges and obstacles you face.

5.1.2 Primary documents and reports

The main primary data are the semi-structured interviews: six interviews are transcribed, analyzed and the data are reorganized in an Excel Sheet that represents the *findings framework* (see 5.2 Findings).

In the following table (Table 5.1) a brief summary about the information of the organisation interviewed is available: to facilitate the linkage with the findings they are divided by projects, by the seven case studies that will be reported in the next chapter. The Table 5.1 underlines each case study code, case study name, the organization interviewed (only in case A more than one organization has been interviewed about each case study), the respondent code and its role in the related organization.

Case code	**Case study Name**	**Case study Location**	**Organisations interviewed**	**Respondent code – role**
Case A	Malaria treatment SC	Zambia	1.INGO 2.No-profit organisation	R1 – CEO of INGO R2 – PM of INGO R3 – CEO of No-profit
Case B	Emergency distribution SC	Madagascar	INGO	R1 – CEO R2 – PM
Case C	Food rations SC	Syria	UN agency	R1 – Logistic Assistance
Case D	Cash based assistance SC	Syria	UN agency	R1 – Logistic Assistance
Case E	Survival kits pre-positioning	Kenya	Private company	R1 – Operation manager
Case F	Hurricane Dorian response SC	Bahamas	Private company	R1 – CEO
Case G	Medical distribution in Yemen	Yemen	INGO	R1 - Head of logistics

Table 5.1: Case studies - Interviews details

These are the other primary sources for each case study (Table 5.2): only the website or reports effectively used are reported. Obviously other sources are researched but no additional information is available. A point attention is the case E: not many sources are available (maybe because it is an old project or maybe because it is a pilot project) and for this reason the interviews transcription represents the main data.

Case code	Primary sources
Case A	*NGO_{A1}* : organisation website; knowledge center; manual for maternal health; projects final report (2013, 2016); projects training manual *Private $Company_{A2}$*: Company website *Non-profit $organisation_{A1}$* : news and organisation website
Case B	*NGO_{B1}* : organisation website; knowledge center; manual for maternal health; projects final reports *Governmental $agency_{B1}$***:** reports on the project; articles on the project – archive *Non-profit $organisation_{B1}$*: organisation website; articles on the project
Case C	*NGO_{C1}*: organisation Website; Annual country Report (2018, 2017, 2016); Monthly report (December 2019 - November 2019); Emergency Dashboard (December 2019) *Logistic cluster:* website
Case D	*NGO_{D1}*: organisation Website; Annual country Report (2018, 2017, 2016); Monthly report (December 2019 - November 2019); Emergency Dashboard (December 2019); report 2018 with FAO *Logistic cluster:* website
Case E	*Private $company_{E1}$*: website but no data on the project. *No other sources available*
Case F	*NEMA*: organisation Website; news on the disaster and projects *PS_{F1}* : organisation Website and release; news on the disaster and projects; *NGO_{F1}*: organisation Website *Military*: website of the different militaries involved
Case G	*NGO_{A1}*: organization website, annual report 2018 *No-profit $organization_{A1}$:* organization website *OCHA:* OCHA website, fact and figures Yemen (20/07/2019)

Table 5.2: Case studies - Primary Sources

5.1.3 Secondary sources

Regarding the secondary sources in few cases they could be retrieved. Mainly case A and F are beneficiaries of the secondary sources as it is possible to see in the Table 5.3.

Case code	Secondary sources
Case A	Financial Times articles on the project; New York times- articles on the project; Tryre Trade news- articles on the project; severe malaria observatory; case study of local volunteers
Case B	*No other sources available*
Case C	*No other sources available*
Case D	K4D research helpdesk
Case E	*No other sources available*
Case F	cbc news; Clinton foundation news; reliefweb; videos and newspapers on the disasters
Case G	Il Fatto Quotidiano-news on the project; info-cooperazione news to take part in the project

Table 5.3: Case studies - Secondary Sources

5.2 Findings

The findings are now reported following a precise structure but before it is important to remember the **unit of analysis** of this research: the collaboration project itself. It is cross-sector collaboration project: it involves actors from different sectors (business, governmental, no-profit). The collaboration projects are supply chain projects in the field of humanitarian aid, they can be related to all the different phases, without any specific restriction on the disaster type (both natural, man-made), the location extent is the country or regional level but in developing countries. Further details are available in the methodology chapter (3.3 Research methodology).

As said in the methodology chapter (3.2 Research Method) the data collected are reported in a ***findings framework*** in order to permit a systematic collection of each case and later a cross-case analysis. See Appendix 4: Sample findings framework for an example of the structure. The findings framework is built based on the protocol of the interview and is slightly different from the SLR framework: it has not been included some dimensions:

- *Risks*: The exclusion of the first variable is driven by different motivations: firstly, it is not analyzed in the literature and maybe the reason is due to the fact that in the humanitarian context the SC risks or collaboration risks is not a proper term, it is not a well-defined metric. Adding this type of question could only confuse the interviewee.
- Secondly risks management and assessment is a very broad topic for which deeply research is necessary in order to reach evidences. In conclusion the risks dimension can be classified *out of scope*.
- *Scope*: Regarding the *scope* variable, from the literature emerges that it depends from the focal company's point of view. The case studies that will be analyzed are not dyadic relations but cross-sector ones, a so strict categorization of upstream and downstream seems not very useful neither appropriate.
- *Disasters dimensions*: The disaster characteristics are very context-specific: in each case they can be strongly different, and they are not comparable across cases. Therefore, the information about it are not systematically collected by dimension. Nonetheless some specific and relevant information are reported to describe the disaster of each case and they are summarized and reported in the findings. Among these it is always reported the disaster phase because it seems a comparable element among the cases and because, according to the literature (4.4.2 Disaster Dimensions), it strongly influences the humanitarian project and as a consequence the collaboration.

Consequently, 16 dimensions compound the findings table together with a final variable about the disaster phases. The total number of dimensions is 17.

The dimensions of the *findings framework* (17) are divided in sub-elements that are linked to the specific questions of the protocol. The following Table 5.4 is a brief summary of the framework with its dimensions (first column) and sub-elements (second column).

TIME SPAN	Lasting
DISASTER PHASE	Disaster phase or other information
ACTORS	How many
	Type
	Roles
	Initiator
MOTIVATIONS	Beginning
	Changes
	Achievement
	End
PARTNER SELECTION	Selection criteria
	Partner performances evaluation (before)
	Previous relations with partners
	cost/benefit analysis (before)
INSTITUTIONALIZATION	Formalized
	Usefulness of formalization
ACTIVITIES	Activities
	Responsible
	SOP
RESOURCES	Resources shared
INFORMATION SHARING	Type of info gained
	Type of information shared
	Language
COORDIANTION MECHANSISM AND DECISION MAKING	Responsible
	Communication tools
	Coordination mechanisms
	Meetings
	Central coordinator
LEVEL	operational or strategical
RELATIONSHIP DYNAMICS	Cost-benefit sharing
	Balanced
ENABLERS	Enablers
CHALLENGES	Challenges
OUTCOMES	Collaboration outcomes
	Collaboration costs
	Cost/benefit analysis (after)
PERFORMANCE MEASUREMENT	Performance measurement of collaboration
	Partner performances evaluation (after)
	Performance measurement of itself
	Risk assessment
TYPE	Vertical
	Horizontal

Table 5.4: Findings framework

In addition, after the findings transcription and reading a **collaboration relations map** is developed for each project. The map tries to show the main relations that are present among all the partners involved in the collaboration project. It is available for all the projects excluding the case F: the sources do not identify clear relations among specific actors, maybe a structure is not really clear because the actors' involvement evolved organically across the Dorian response.

The main elements of the maps are:

- The actors present are the main partners involved in the collaboration projects
- The relations among the actors are expressed as lines: they are relations so there is not a unique direction, but it is always bidirectional
- Evidences for the existence of the relations among each actor are not always available: when an assumption is made on the existence of a relation the links are drown as dot lines
- When enough data are available, it is expressed also which kind of relation is or which area does it affect: for example, if the relation is focused on a specific activity (e.g. training) it is reported the name of the activity.
- Some specific roles, that can be assumed by the actors, are identified: donor, beneficiaries and central coordinator/chain coordinator
- If a huge coordination structure is present (e.g. consortium) it is depicted by blue color

As a result, each collaborative project findings structure is composed of these **main steps:**

1. Respondents and company profile: for each project few information about the respondent/s and its organisation is reported
2. Projects profile: some specific information about the project. They are summarized in a table with the project name, location (where the collaboration projects has taken place), disaster phase (the assumed disaster phase), time span (the lasting of the collaboration project), the aim of the project and a small description of this with the main activities and the objective of the project.
3. Findings contents: the data are reported divided by dimensions of the *findings framework* excluding the time span and the disaster phase, for a total of 15 dimension. However, the dimension and its contents are reported only if data about it are available. Sometimes, when the division is clear, inside each dimension the sub-elements are reported.
4. Further developments: if the project has some consequences and future projects or collaboration linked to (only in the case F it is reported a specific development)
5. Collaboration relations map: as described above a map of the relations among the main actors is reported with a brief comment

A brief summary of each case content is reported in the Findings content of the Executive Summary chapter.

5.2.1 Case A: Malaria treatment supply chain

Respondents and company profile:

It is the only case where two interviews are retrieved: one is with R1 and R2, two respondents from the same NGO and another interview is with R3 representative of a second organisations involved in the same collaborative projects.

R1: respondent for the $NGO_{A1/B1}$, Chief Executive of the organisation. $NGO_{A1/B1}$ is a non-governmental organization which works with partners and governments to solve transport challenges developing countries. They have mainly focused their efforts to improve the safety on the African roads and to provide access to vital healthcare services.

R2: respondent for the $NGO_{A1/B1}$, he is Project Manager for Access to Health projects.

R3: is the CEO of Non-profit $organization_{A1}$, a no-profit consultancy company in the data analysis sector.

Projects profile:

The respondents refer to a collaboration project developed to face malaria. It is built on two earlier maternal health focused projects, Project PA1 (2010-2013) and Project PA2 (2014-2016). The majority of the partners were involved also in these previous projects.

Name	Location	Disaster Phase	Time span	Aim	Short description
Malaria treatment supply chain	Serenje District, Central Province, Zambia	Across phases	July 2017 – December 2018	The programme works primarily on the demand side, it aims to address the lack of access to quality severe malaria treatment commodities	It works on two sides: it helps to pilot the introduction of use of rectal artesunate suppositories (RAS); it seeks to reduce barriers and delays in treatment at the community and at the facility level, identifying severe malaria cases. It includes also the strengthening of emergency transport systems to take the children to health facilities

Table 5.5: Project A profile

Findings contents

Actors

The respondents have referred in general to the involvement of the following actors in the Zambian collaboration. From the secondary sources it seems that the roles of them slightly change as it is specified.

Zambia government: In particular, they refer to the **Ministry of Health**. Government is considered by R3 as a key beneficiary of whatever comes out from the project.
District Health Management Teams (DHMTs): they are people who work at a district level in relation with the National Malaria Elimination Center (NMEC)

There is a consortium which includes different organizations:

1. **Non-profit organization$_{A1}$:** it is represented by R3 and it is an African data management organisation. R3 describes the organization as *"an information collection, analysis and interpretation organization".* It could be considered an initiator of the project because they started with NGO$_{A1}$ *"from scratch".*
2. **NGO$_{A1}$:** It is the INGOs interviewed, in the consortium "*brings some emergency pieces*" and can be considered an initiator of the project.
3. **NGO$_{A2}$**: is a Zambian NGO (LNGO) which offers training in wheelchair technology, repair and manufacture devices parameters and emergency transport equipment.
4. **Private Company$_{A2}$**: It is an international development company that from primary sources have managed PA1 project. They are addressed during the interview as a "*source of expertise"*.
5. **Non-profit organisation$_{A2}$** is a Swiss foundation, it provides ongoing technical support and fundings.

Non-profit organisation$_{A3}$: it is a registered charity in the UK who is the founder of PA2 Projects
National Malaria Elimination Center (NMEC): they have the mandate of the Ministry of Health for malaria elimination. It is a governmental agency addressed as the coordinating body with the Ministry of Health for the project.
Ambulance drivers: from secondary sources they are taxi drivers
"*Other implementing partners*": they are trying to scale the project across the country

Motivations

R1 and R2 speak **in general** about the reasons to collaborate without referring specifically to the project A.

The respondents state that the *"collaboration is still essential to bring everybody's key skills together"* [R2], in fact *"different people got core competencies, you can come together and share that"* [R1]. The mobilization and sharing of this expertise are main reasons to start a collaboration, for example the first respondent mentions cases in which a big actor calls and engages NGO$_{A1}$ for their expertise and resources on the transportation side.

Private sector: they consider it as an alternative source of funding; for example the second respondent says: *"I think actually a lot of the success lies in working with private companies because you can't rely on you know public funded projects forever"[R2].*

They consider also the private sector perspective reporting that sometimes the companies have a willingness to make profit rather than social impacts: "*that's about you making profit in this*

country" [R1] but they also want to "*work more strategically. They* [the private companies] *don't want to just give us cash, how do we work together to draw on their expertise"* [R1].

To what concerns **Non-profit organization$_{A1}$** perspective, it seems that they collaborate with NGO$_{A1}$because it gives them the possibility to accomplish their aim: to provide data and analysis of them about the southern region of Africa.

Selection criteria

In Zambia NGO$_{A1}$ already knows the actors because they were there before, so they selected "*partners that we know aligned values as well and ways of working and it can be trusted in[…]"* [R1].

In particular, R3 states that they collaborate with NGO$_{A1}$ for eight years; at the beginning they applied to a bid and from that a relationship develops and so they started to build together the projects such as project A.

In addition, R1 and R2 state they select just a balanced number of partners: NGO$_{A1}$ knows that it is not possible to collaborate with so many partners at the same time.

Institutionalization

This are specific agreements present in the Zambia project:
Memorandum of understanding: This agreement expresses convergence of will between the parties, R1 reports the presence of this agreement especially with local partners: ***"****other times we may work under the memorandum of understanding. So we have a more use with them, in Zambia and Tanzania, with the vocational training partners that we're working with and so that sets out the nature of the collaboration."*

R3 mentions the existence of a **terms of reference** which *"clearly defines the scope and the roles and responsibilities of everyone involved".* He specifies that the terms of reference indicate the timelines, the deliverables, the data disclosure policies or in general the information sharing, the activities and resources sharing. This term of reference is flexible: it could be modified before and also after the sign through the "*addendums added because there is a level of […] unpredictability in any agreement*".

The respondents provide also some general observations and opinions about the use of the agreements. In particular R1 and R2 underline the importance of them. R1 says that *"there always has to be something. It just depends on […] what be the best instruments, the most appropriate for the different way that we're working with"*; the different ways *" […] are incredibly different and depending on who we're working with, on what, for how long, and we sell funding or others funding to peak finance and conditions of grant on when we're working with […] often varied"* . It seems that contracts are fundamental to regulate the relationships among the partners, R1 couldn't retrieve examples in which is convenient to work without agreements.

They also specify some aspects that should be present. The agreements indeed *"is about shared understanding with partners, about what you want to achieve together and to make sure there's no misunderstanding and […] If you are going to accept donor funding, you have to understand what their conditions are […]"[R1],* the second respondent says: *"even on the perspective of, you know, meeting deadlines and things oftentimes in an agreement, you have a timeline, just so you know which partners responsible for getting work done on time and we're quite reliant on that from partners that rely on us. So, yeah, I think just the fact of having it all written down is quite important"*. These agreements include also a sort of KPIs agreeing "*What are you going to deliver, what is success criteria* "[R1] and again what is "*the output is going to be*"[R3].
In addition, they recognize the necessity to have flexible agreements because needs should be reviewed, landscapes change, country priorities change.

R3, instead, recognizes the need of the contracts to regulate the daily work nonetheless he considers the building of relationship more important than the agreements themselves.

Activities

Activities

In this project it is possible to identify some activities performed by the different actors:

NGO$_{A2}$: it is the one who manufacturers the devices and emergency transport equipment. In particular from secondary sources it seems responsible for providing trailers.
Non-profit organization$_{A1}$: R3 states that*: "we were involved in the design of the program, in terms yes in terms of assessing the best line situation in terms of understanding knowledge gaps, in terms of health seeking behaviors, and so forth. And then we also implement a Community monitoring system".* So this organization is in charge of the collection and analysis of the data to assess and monitor of the project.
NGO$_{A1}$: it works with the communities for "*mobilizing, cheering training, cascading messages* […]; *and then they offer the support and supervision and trying to make sure that's linked with the Ministry of Health that the District Health Management Team"*. The NGO tries to bring its expertise and train the community on transport aspects brining also the manuals and guidelines.

SOP

R3 states that non-profit organization$_{A1}$ is using protocols such as UN guidelines to design the work, conduct evaluations or doing the survey within their organization; sometimes they share these SOPs with the other partners of the collaboration. No other data are available.

Resources sharing

R1 and R2 say that NGO$_{A1}$ is used to share with partners information, human capital and knowledge. In addition, R1 says that NGO$_{A1}$ is quite transparent and share with the other partners the program budget (and the relative information).

From primary and secondary sources, it seems that in project the transportation devices are shared between the manufacturers, NGO$_{A1}$ and the communities. Consequently, bikes and trailers are good examples of such devices.

In addition, R3 asserts that funds, technical inputs (e.g. volunteers) and equipment, vehicles, office furniture funded by the project's money are shared among the partners of the consortium. These resources are handed over by the government at the end of the project.

Information sharing

For both projects the information within the partners is shared, in particular R1 remarks that "*we're quite transparent with how […] we would make the overall program budget typically available to quite a lot of the partners and the different ways that we're working*". So, they share accountancy information and way of workings. Especially it seems that the steering groups and the consortium enhance this sharing of information because it is used to "*meets and talks about any direction*".

R3 confirms this vision; in particular non-profit organization$_{A1}$ shares its datasets with all the partners. In addition, they produce reports and analysis that are presented to national stakeholders such as the government. Non-profit organisation$_{A1}$ reports "*Working with government partners, that is often a very important thing that we would rather produce the report and highlight the findings as they are, and without necessarily changing anything about the findings themselves, desirable or undesirable*." The reason of this reporting is the fact that the government is in some way the key beneficiaries of this project.

In addition, R1 identifies the language as a barrier in Zambia because there are over 70 languages. It is interesting that in this case the language is different in function of the actors (for example NGO$_{A1}$ speaks English with Ministry of Health) but NGO$_{A1}$ is used to "*hire locally and we working with partners*" even, not just, due to language barrier.

Decision making and coordination mechanisms

Coordination mechanisms

The respondents point out different mechanisms that are present in the project and also the importance of having the best mechanism in order to favor coordination.

1. Consortium

Combining the interview and the other primary sources it seems that also in this project there is a consortium where different people have led, and the decision making is quite shared. R1 says *"the evidence about me is that the consortium dynamic has changed, and different people have led, and we've still got good outcomes in ways of working. Because that shows that it's quite shared decision making, and people are quite free with each other and things like that so yeah and just mutual respect.*"

2. Steering groups and quality insurance groups: the interview reports this mechanism as an important tool to coordinate and reduce the conflicts; in this group *"every partner having a vote in those is trying to make sure that there's a way of working, where people are engaged and happy and anything that comes up can be resolved."*[R1]
R1 mentions also separately the two groups:

Steering group: if there is a consortium the steering group probably is present, and it is composed by representatives of consortium members. It seems to have different roles and aims:

- It is used to *"meets and talks about any direction"*
- To jointly design the work
- To understand the ministry requests and how to respond to them
- To regular check the work, *"to make sure we are responding to that need" [R1]*
- *"to calculate that local ownership and make sure coordination" [R1]*

Technical quality insurance groups and governance insurance groups**:** they are, for R1's opinion, important mechanisms to favor coordination and to have "*clearly defined roles and responsibilities […]",* this is particularly useful *"when the agenda is changing and is urgent"* [R1].

3. Community level mechanisms:

The R1 reports about coordination mechanisms that are already structured and present at the community level in Zambia however no practical specifications about them are highlighted. Probably they link the government (NMEC) and the district health management team that are at a community level. The general idea is that these mechanisms should "*make sure that's linked with the Ministry of Health, […] the District Health Management Team have their own mechanisms for going and every month doing follow up and quality; at the community level it's structured around in Zambia neighborhood health committees and agencies".*

4. Central coordinator:

In this project the central coordinator is the Ministry of Health, in particular the National Malaria Elimination Centre (NMEC). It has different roles:

- It receives the mandate from the Ministry of health, and it controls, approves in the government's name: NGO_{A1} cannot do anything without the ministry mandate.
- *"has an interest to see that work being done"* and to eliminate the malaria.
- *"provide the logistics around how to get that work done*
- *"give us [*non-profit organization$_{A1}$*] all the necessary support in accessing the communities, the health facilities and the stakeholders"*

5. Meetings:

In addition, R1 opinion's is that if the consortium has a steering group, its members meets and talk.

R2 reports that now, after 10 years, NGO_{A1} can easily contact and meets with other partners. However, R2 admits also that it is really hard to do this at the beginning, at the very first day.

Decision making

In terms of decision making, R3 states that the terms of reference clearly define the role and the responsibilities; in his opinion it is *"very important for avoidance of disputes".*

It is interesting that in this case, R1 reports a *natural transition of responsibility* to local partners. They "*are now leading that program […] no of ownership and therefore redefining of the roles of different partners*".

Communication tools

Regarding the communication tools just two general observations are underlined: firstly, that to communicate with other partners R2 mentions the use of periodical reports. Secondly, focusing in the relation with the beneficiaries R1 highlights the need to take into account other communication ways *culturally appropriate* making the *"things easily memorable: song, dance, there's a lot that the body tools for the danger signs".[R1]*

R3 reports which communication tools are used: WhatsApp, emails, phone calls for day to day communication and email, signed attachments, workshops, conference meeting for formal communication.

Level

Regarding this variable the main findings that can be observed are some correlations between other collaboration variables. Indeed, R1 reports that the level, "*the nature of the collaboration*" depends on the type of agreements and that NGO_{A1} has varied ways of working "*depending on who we're working with, on what, for how long*" and on funding aspects.

Relationship dynamics

In this project, R1 says that "*consortium dynamic has changed and different people have led [..]"* and that it is *"quite shared decision making and people are quite free with each other […], just mutual respect for. We try to have one organization has one vote to on decisions […]*". Consequently, it seems that in this case a balanced collaboration is established, where independently from the size that R1 reports as a key driver for definition of role and power, everybody has "just *mutual respect for the partners*". Also respondent R3 says: "*deliberate equity within the Consortium because thinking and trust has already been built*". It is clear the balanced dynamics that it is present in this case.

However, R3 identifies an issue that emerges in international collaborations: there is an imbalance between local and international actors because the rates of the local partners are lower even if the quality of the work is the same. Nonetheless, about project A, he adds that *"the rates we charge it par across the consortium, but that's because this particular Consortium, there was a deliberate equity thinking and trust that has already been built. […] This is the ideal that we have with NGO_{A1} in Zambia. But that's one in a million almost."*

Enablers

The enablers specific of project A identified by R1 or R2 are:

1. Trust in the brand credibility of the consortium [R1]
2. Sympathy in that country, in Zambia NGO_{A1} has been there for a long time [R1]
3. Introduction of a social fund: it helps the collaboration at the community level, it is used to strengthen the community systems, as incentive for the volunteers to continue their work.

4. Effective community engagement, a functioning drug supply chain, implementing an innovative emergency transport system for patients using bicycle ambulances and increased access to key medicines for severe malaria
5. R3 mentions some of the enablers above and he adds "*Be proactive in identifying challenges and methods to resolve them*".

In addition, R1 and R2 mention collaboration reported independently from the projects such as:

6. Flexibility about changes in need assessment and create the "*a bit of space to make sure we say, you know, is this right, is this responding for me, does this what people want and create a space for people to meaningfully input*" [R1].
7. A one-to-one relationship with donors in order to "*if you've got a one on one relationship you can make a strong case for a good development that should allow that flexibility to respond to changing needs on the ground*" [R1], permits a flexibility of funds.
8. Open communication and differentiated by partners: "*show that you're listening and respecting and that you want to collaborate*", learning in a very quick way "*how to communicate with different types of partners*" with "*making voice heard*" or a more soft approach [R2].
9. Appropriate language and cultural norms [R1]
10. In the case of collaboration with private companies it essential the "*understandings of what the project goals*" [R2].
11. Small size: "*I quite favor small collaborations just because they're quick, efficient, they're flexible, everybody's generally quite keen, don't have a million things going on at the same time"* [R2].

Challenges

The interviews highlight some challenges of the project. These are not just projects-specific challenges but most of them could be considered generalizable.

1. Overlapping: Related to the usage of local partners to scale across the country is the possibility of overlapping, making the same services of covering the same needs
2. As in this project an attempt of *horizontal collaboration* has been tried some challenges typical of this kind of collaboration arises:
   - Often other organizations are *already busy* and is difficult to speak, coordinate, meet
   - the risk of intellectual property: "*naturally different NGOs have got different technical specialist and that they're really passionate about"* challenging the possibility of collaboration.
   - No planning organization or coordinating body: getting in new country is difficult also because "*you have to fit into the roadmap, but there's no planning organization just trying to do things left, right and center that doesn't advance government aims that doesn't make sense or they don't even know working there*" [R1].
   - Competition for funds : sometimes there are bids for the same money from different partnerships, competing for the same money with different groups because "*it's not like all the groups are going to have one big come together and applied together, I mean, they are going to compete, they're going to have different ideas*". [R2]

3. The need of government mandate, because "*we do nothing without working ministry because we have no mandate*" [R1]. Complications for it can easily arises
4. Being new in the territory: it is clear that starting relationships in new country can be challenging "*at the beginning it's really hard to just even get a meeting going, and that can really put a big block on your project*" [R2].
5. Donors restrictions: they decide where they want to put money, there are "*complexities of what some donors will and won't fund*" [R1], they can have different priorities, different "*donor restrictions about what you can do with certain funding or not*"[R1].
6. Strict budgets: budgets can be tight complicating the "*balance of how much you spend in the field implementing versus the coordination and advocacy piece*" [R1]. R3 specifies that a challenge is the misalignment between the available budget and the request of the clients. He adds that the agreements could help to solve this challenge specifying what is included and what it isn't.
7. *"Things that are beyond your control":* R3 states that a challenge are the unexpected changes in the environment. R1 refers in particular to changes in country priorities: often the country priorities are decided early (like 18 months in advance) and approved by the donors, however these priorities can easily change, and it is not always accepted by the donors.
8. Time pressure situations: often there are "*life death situations*"[R2] and the time is a challenging variable for collaboration
9. Communication or miscommunication [R2]
10. Not sharing of common infrastructure (like distribution channel) because they are founded by different donors, especially true in case of horizontal collaboration [R1].
11. Workload [R2]
12. Expectations [R2]
13. Public health SC that is very complicated [R1]
14. Partner agencies who work for different objectives: R1 reports the existence of agencies that work in this area but "*they are run as businesses and they are, you know, consultancies who have different demands on them or they have different growth targets etc*".

Outcomes

The respondents R1 and R2 list the following qualitative outcomes that makes a collaboration successful:

- Communication [R2]
- Share values [R1]
- Transparency [R1, R2]
- Flexibility in order to "*take into account each other's opinions, thoughts, findings, also schedules*" [R2]
- Valuable contributions of each partner because "*a good collaboration is people know what they're doing, they bring something valuable to the table and clear lines of who's doing what and an escalation if there's issues"*[R1]
- Importance to not underestimate the time needed for collaboration [R1]

R3 gives a significant contribution identifying other main collaboration outcomes:

- *"If you can still maintain your relationships and your networks"* this is an indication of the value of the collaboration
- Shape the government policies: *"if you see something that you have been involved in being used in public policy or national policy That's also an indication of the value of your work"*
- R3 identifies also that an advantage for non-profit organization$_{A1}$ emerged by the collaboration itself: work with NGO$_{A1}$ which was already set in Zambia has enhanced the possibility to work locally without establishing their own office in Zambia.

Other project-specific outcomes are retrieved from other primary or secondary sources.

Quantitative outcomes:

- The project reaches about 54,000 people (40% of the Serenje District, Zambia population)
- The reported case fatality rate from severe malaria reduced from 8% at baseline
- Severe malaria child case fatality was drastically reduced from 8% to 0.25%, with three recorded deaths during the 12-month study period compared to 97 deaths that would have been expected in this period
- NGO$_{A1}$ emergency transport scheme made 1,066 transfers to a health facility

Performance measurement

R1 describes the existence of KPIs in their projects in general but not with a clear reference to specific measurements. Indeed, R1 reports the existence of "*different KPIs, different measurements of the success of*" but the necessity also of a mechanism (like steering group or technical quality assurance group or internal project level) to "*measure progress […], to be able to make sure that there's the ability to respond to that and adjust the program according to changing environment as well*."
In addition to that R1 answers about collaboration KPIs saying that "*we would focus more I think on those sort of output and outcome indicators together and that we're all playing a role in achieving*".

R3, instead, gives more detailed information about the measures of the project.

In order to assess the results of the project they measure the same metric before and after the project (e.g. the number of children who die for malaria). They add qualitative measures to check the reasons of the changes in the quantitative metrics.

R3 describes also the tools used to measure the performances: an endline survey to assess the changes in mobility and mortality and a Community Monitoring system implemented by non-profit organization$_{A1}$ which tracks the number of volunteers, the number of transfers, the health outcomes.

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Horizontal collaboration

In the Zambia project R1 confirms the attempt of horizontal collaboration with the other NGOs who are working on malaria programs. In particular NGO_{A1} is trying "*to advocate for some of the areas that they mostly transport bit*" [R1]. To reach this collaboration, after the evidence that the projects is working, they trying to say "*that's how we can scale together, we can't be everywhere looking the same, but if we can pick up, you know, the elements that working* [it could be possible]". R1 reports also the presence of a formal agreement to collaborate together, sending trainers and making "*sure that we're sharing and learning the best practices for both*".

They have also tried some coordination mechanism like Safe Mother Action Group and National Manual Coordination confirmed by other primary and secondary sources. However R1 opinion is that it "*was unreal because you had so many different people, like we can't let go of this element or this bit needs to be strengthened but you've got […] a 300 page manual*" and often people do not have even the resources to print and read them.

Finally a big challenge is related to the tight resources because for example in the transport side "*the emergency transport phase not everyone can afford to have the components*" and NGO_{A1} is trying to "*follow the interface package of training*" adding some elements, but it seems very complicated.

Collaboration relations map

As described before in 5.2 Findings, from the data of the findings in the different dimensions a map (Figure 5.1) of the relations between the different partners is provided.

As explained, the lines where information is available the main aspect that regards this relation is highlighted: in this case for example the NGO_{A1} provides training to the local drivers and this relation is focused on this type of activities. There are also two relations that are supposed (the two dot lines): the first one is the relation with the NMEC and the consortium. It is reasonable because NMEC is the responsible for the decision making of the collaboration. In addition, probably the consortium (or its partners) has relations with the district health management team which represents the local structure of the NMEC: for sure they interact with them who then serve the beneficiaries.

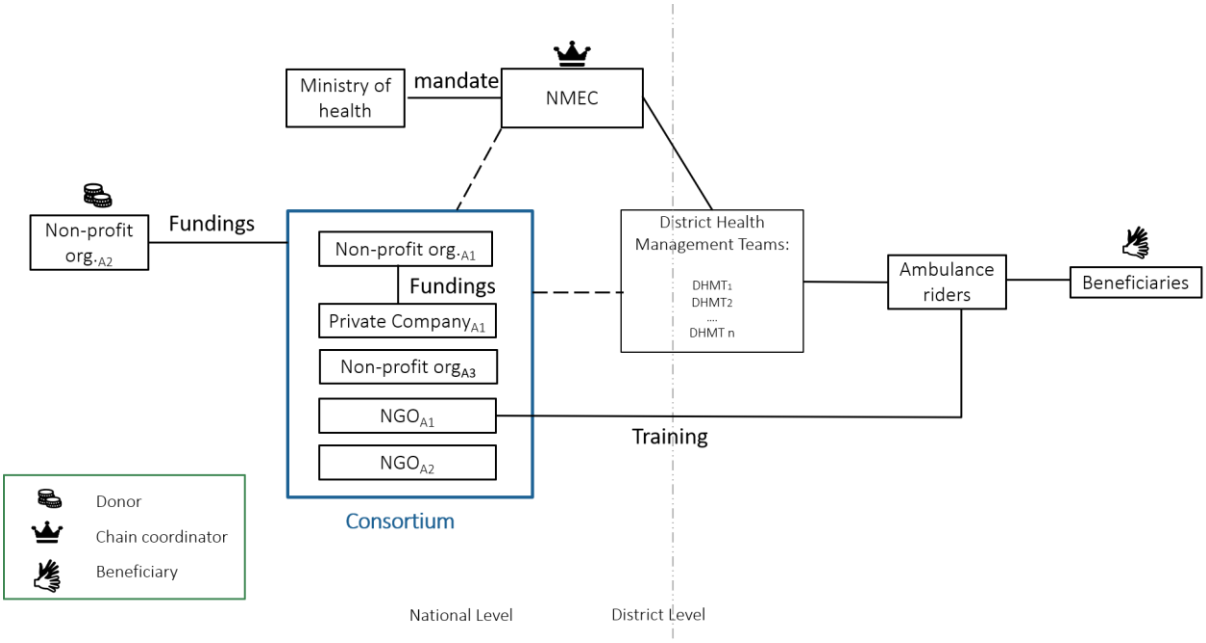

Figure 5.1: Collaboration relations map - Case A

5.2.2 CASE B: Emergency transport in Madagascar

Respondents and company profile:

R1: respondent for the $NGO_{A1/B1}$, Chief Executive of the organisation. $NGO_{A1/B1}$ It is a non-governmental organization which works with partners and governments to solve transport challenges in developing countries. They have mainly focused their efforts to improve the safety on the African roads and to provide access to vital healthcare services.

R2: respondent for the $NGO_{A1/B1}$, he is Project Manager for Access to Health projects.

Project profile:

Name	Location	Disaster Phase	Time horizon	Aim	Short description
Emergency transport in Madagascar	Regions in north and north-west Madagascar (Menabe, SAVA, DIANA, Sofia, Melaky, and Boeny)	Across phases	First round (2011 – 2016) and second round (2016-2021)	It is a health program that provides basic health services in: maternal, new born, and child health, family planning and reproductive health, water, sanitation, and hygiene, nutrition and malaria treatment and prevention	It is a trial of innovative solutions using transport to improve community health volunteer (CHV)mobility, improve access to health services through emergency transport systems (ETS) and transport-related microenterprise activities .

Table 5.6: Project B profile

Findings contents

Actors

These are the main actors involved in the Madagascar project mentioned by the respondents:

Non-profit organization$_{B1}$: public health research and consulting firms dedicates to improve the health of individuals and communities throughout the world. It leads the consortium in field, is the lead partner in project implementation; they have a really good expertise.
NGO_{B1}: It is the INGOs interviewed, in this project their role is small *("we're a very, very small fraction"),* but it is an implementing partners on transportation aspects.
NGO_{B2}: non-profit humanitarian development organization dedicates to improve lives in lasting ways by advancing integrated, locally driven solutions. It can be defined as INGO.

US organization$_{B1}$: it is a U.S. Government agency that works to end extreme global poverty and enable resilient, democratic societies. It funds the project and it has local offices in Madagascar in the regions in which the project is settled.
Private company$_{B2}$: according to the secondary sources it seems to be a significant actor of the collaboration even if the respondents never mentioned its involvement. It is a small business that provides expertise in social and behaviour change (SBC), communications, and knowledge management (KM) to development programs around the world. It is an implementing partner.

15 Malagasy NGOs: from secondary sources many local NGOs are involved in the project.
Madagascar government: they refer to the presence of the **Ministry of Health** it supports and approves the project and **the Ministry of Transport** which is the only main body that organizes transport and also selects drivers.
Local association: it organises and provides the drivers.
Taxis drivers

Motivations

The respondents speak **in general** about the reasons to collaborate without referring to each project.

The respondents state that the *"collaboration is still essential to bring everybody's key skills together"* [R2], in fact *"different people got core competencies, you can come together and share that"* [R1]. The mobilization and sharing of this expertise is a main reason to start a collaboration, for example the first respondent mentions cases in which a big actor calls and engages NGO$_{A1}$ for their expertise and resources on the transportation side.

They say also that the collaboration could be due to more contingent reasons: in the Madagascar case they have 6 milions of grants and so many groups wanted to join; this is the reason also of the end of the collaboration: when the funds ended they have gone away.

In addition, during the interview they mention also the reasons to collaborate differentiated by specific actors.

Local actors: The relation with local association and Ministry of Transport as very important because *"we're relying on them for the sustainability of the project. For example, if we're doing driver training they're expected to carry out the training once project leaves."*[R2] The sustainability on a long term perspective can be identify as a good beginning reason.
In addition, NGO$_{A1}$ collaborates with local partners in order to scale up across the country.

Private sector: they consider it as an alternative source of funding; for example the second respondent says: *"I think actually a lot of the success lies in working with private companies because you can't rely on you know public funded projects forever […]."[R2]*

They consider also the private sector perspective reporting that sometimes the companies have a willingness to make profit rather than social impacts: "*that's about you making profit in this country"* [R1] but they also want to "*work more strategically. They're* [the private companies] *not*

just, they don't want to just give us cash, how do we work together to draw on their expertise" [R1].

Selection criteria

In the Madagascar case NGO_{B1} is selected by Non-profit organization$_{B1}$ because of their transport competencies. And when NGO_{B1} selects the partners (such as the drivers) no competition is present because they rely on the Ministry of Transport and its association*: "the Ministry of Transport is the only main body that organizes transport and also when we were selecting drivers, all of them would could gather at the station and the station has an association and so it just makes sense to them, work with the association"*[R2].

Institutionalization

To what concerns the agreements some general observations can be reported, in particular both the respondents underline the importance of them. R1 says that *"there always has to be something. It just depends on […] what be the best instruments, the most appropriate for the different way that we're working with"*; the different ways *" […] are incredibly different and depending on who we're working with, on what, for how long, and we sell funding or others funding to peak finance and conditions of grant on when we're working with […] often varied"* . It seems that contracts are fundamental to regulate the relationships among the partners, R1 couldn't retrieve examples in which is convenient to work without agreements.
They also specify some aspects that should be present. The agreements indeed *"is about shared understanding with partners, about <u>what you want to achieve together</u> and to make sure there's no misunderstanding and […] If you are going to accept donor funding, you have to understand what <u>their conditions</u> are […]"[R1],* the second respondent says: *"even on the perspective of, you know, <u>meeting deadlines</u> and things oftentimes in an agreement, you have a <u>timeline,</u> just so you know <u>which partners responsible for getting work done on time</u> and we're quite reliant on that from partners that rely on us. So, yeah, I think just the fact of having it all written down is quite important"*. These agreements include also a sort of KPIs agreeing "*What are you going to deliver, what is success criteria* "[R1].
In addition, they recognize the necessity to have flexible agreements because needs should be reviewed, landscapes change, country priorities change.

Generally, they specify the presence of these three types of agreements:

Formal agreements: They refer in general to a formal agreement as an engagement to work with the other NGOs to collaborate in other parallel programs (horizontal collaboration).

Non-disclosure agreement: they mention that the partners often asked them to sign up non-disclosure pre teaming to avoid problems for the allocation of funding.

Concept note: Sometimes NGO_{A1} uses this to have *"a shared understanding about what does that look like, what's the time period, what are you going to deliver what success criteria."[R1]*

The agreement specifically used to the Madagascar project is:

Cooperative agreement: In the Madagascar case, Non-profit organization$_{B1}$ has a cooperative agreement with US organization**$_{B1}$**, and NGO$_{B1}$ has been contracted as a subcontractor to Non-profit organization$_{B1}$. They describe the contract in this way: *"when you get a contract or a cooperative agreement there's different procurement instruments which define different ways of collaborating and ways of working and you have either more flexibility or less" [R1].* This contract also defines the "*indicators that are measuring the success of the program*".
They refer also to the importance to be compliant to the rules to receive the funds.
Anyway, they recognize that "US organization**$_{B1}$** *cooperative agreement places more decision making in country than a contract" [R1]* because contract should be flexible in a changeable environment.

Activities

In this project from the interview is not clear the operational activities performed, however the general data in function of the actors are:
NGO$_{B1}$: it is working with the community on emergency transportation. It is important its contribution because many CHVs work in locations that are largely inaccessible by road, making it difficult and sometimes impossible to get clients to emergency care. Innovative transport solutions are used here.
In addition it also does "*scoping, do needs assessment […]; write a proposal we've got the ability to do a design verification at the beginning to make sure that what we're proposing does respond to the needs of the communities*."
Non-profit organization$_{B1}$: is focused on directly health interventions.
Ministry: it performs a regular check of the different collaboration activities.

From other primary sources some activities are related to the delivering of "*individual bicycles to 1020 CHVs and trained them on topics such as safe operation, management, maintenance, and repair of bicycles*." Probably they are related to NGO$_{B1}$ role, but it is not explicitly mentioned.
There is also a manufacturing activity for fleet: "*For the cycle rickshaw, canoe ambulances, and ox-drawn carts, there was already considerable local knowledge on the design and suitability for the local terrain. Manufacturing was done in collaboration with a Malagasy organization*".

Resources sharing

R1 and R2assert that they are used to share with the partners information, human capital and knowledge.

In the big Madagascar projects is interesting the R2 point of view of resource sharing strategy : "*so it's not gonna have the best use of resources for international technical assistance […] so that we do use a cascade approach, a huge amount of training of trainers of trainers*." Consequently, seems that a cascading approach is the most suitable, however no additional insights are provided.

Information sharing

The project-specific information sharing is not well detailed: the only certain aspect is that the central coordinator (Non-profit organization$_{B1}$I receives the data from the partners and it is then responsible to report directly to the ministry.

R2 identifies the language as a barrier also in this project. The main issue is related to the fact that you need someone in your team that speaks the local language and knows very well the project aims and what to do because he will be translating back to the community. All this process "*takes a lot of time you know to build that up and then, then you have to have confidence"*.

Coordination mechanisms and decision making

Coordination mechanisms:

The mechanisms implemented in the project B are:

1. **Consortium**

Interviewees speaks about a US organization$_{\mathbf{B1}}$ founded consortium: *"Madagascar is different, because it's a consortium, and it's led by* Non-profit organization$_{B1}$ *in field and so we are a collaboration of partners" [R2].* However, no additional information about it are provided, neither specifically who is involved in, surely there are Non-profit organization$_{B1}$, Private company$_{B2}$ and NGO$_{B1}$.

2. **Central coordinator**

R2 recognize Non-profit organization$_{B1}$ as the central coordinator of the collaboration in Madagascar, it has some specific functions and activities such as:

- It makes the majority of the work
- It has a strong relationship with the ministry of Health
- Select NGO$_{B1}$ (and probably all the partners involved in the collaboration) to work on transport aspects and contract them
- It has the final say on the collaboration decisions
- Receive the reports of NGO$_{B1}$ (and probably all the partners involved in the collaboration) and refer to the main local partners

3. **Meetings**

R1 and R2 highlights the importance of meeting both at a national and district level, for example NGO$_{B1}$ is used to visit Non-profit organization$_{B1}$ offices. The aim is to make sure that "*everybody's aware of what's going on*". R2 also reports that sometimes they are used to have monthly meetings even if they are not formalized and "*not written down but it's some of it is unspoken*".

Decision making:

In this case it is clear that everything is under the "*support and approval of the Ministry of Health and other government parties"*. Nonetheless, R2 says that the final decisions on the collaboration are taken by the central coordinator and the partners, like NGO$_{B1}$, has not the *"ability to steer the situation".*

Communication tools

Regarding the communication tools just two general observations are underlined: firstly, that to communicate with other partners R2 mentions the use of periodical reports. Secondly, focusing in the relation with the beneficiaries R1 highlights the need to take into account other communication ways *culturally appropriate* because often local communities, are used to build

"on a strong oral tradition, not producing huge heavy manuals that are going to be given out in the community". It is important to communicate effectively, making the *"things easily memorable: song, dance, there's a lot that the body tools for the danger signs". [R1]*

Level

Regarding this variable the main findings that can be observed are some correlations between other collaboration variables. Indeed, R1 reports that the level, "*the nature of the collaboration*" depends on the type of agreements and that NGO_{A1} has varied ways of working "*depending on who we're working with, on what, for how long*" and on funding aspects.

Relationship dynamics

In this case the dynamics are dominated by the presence of such consortium led by Non-profit $organization_{B1}$ and founded by US $organization_{\mathbf{B1}}$. Indeed they have a mandate from UN agent and "*basically you come with a letter and then everybody honestly just bows down and says yes okay come in, you can come for a meeting*"[R2]. However, the NGO_{A1} is a small organization that is often involved in "*these very, very large programs where we have a small, very small role, it's very hard for us to have an ability to, you know, to steer the situation*" [R1]. For this reason, it seems an unbalanced relation. Also, because this big player is used to "*ask us for opinion but in the end they are making the final decisions*" [R2]. R2 would like a "*bit of an equal balance collaboration, or at least, yeah, in terms of activities*".

Enablers

R1 and R2 report the main enablers of the collaboration in general, they are not referred specifically to project B.

1. Flexibility about changes in need assessment and create the "*a bit of space to make sure we say, you know, is this right, is this responding for me, does this what people want and create a space for people to meaningfully input*" [R1].
2. A one-to-one relationship with donors in order to "*if you've got a one on one relationship you can make a strong case for a good development that should allow that flexibility to respond to changing needs on the ground*" [R1], permits a flexibility of funds.
3. Open communication and differentiated by partners: "*show that you're listening and respecting and that you want to collaborate*", learning in a very quick way "*how to communicate with different types of partners*" with "*making voice heard*" or a more soft approach [R2].
4. Appropriate language and cultural norms [R1]
5. In the case of collaboration with private companies it essential the "*understandings of what the project goals*" [R2].

Challenges

Many challenges of the collaboration project are highlighted during the interview.

1. The need of government mandate, because "*we do nothing without working ministry because we have no mandate*" [R1]. Complications for it can easily arises.

2. Being new in the territory: it is clear that starting relationships in new country can be challenging "*at the beginning it's really hard to just even get a meeting going, and that can really put a big block on your project*" [R2].
3. Donors restrictions: they decide where they want to put money, there are "*complexities of what some donors will and won't fund*" [R1], they can have different priorities, different "*donor restrictions about what you can do with certain funding or not*"[R1].
4. Strict budgets: budgets can be tight complicating the "*balance of how much you spend in the field implementing versus the coordination and advocacy piece*" [R1].
5. Changes in country priorities: often the country priorities are decided early (like 18 months in advance) and approved by the donors, however these priorities can easily change, and it is not always accepted by the donors.
6. Time pressure situations: often there are "*life death situations*"[R2] and the time is a challenging variable for collaboration
7. Challenges that obstacle the horizontal collaboration:

- No planning organization or coordinating body: getting in new country is difficult also because "*you have to fit into the roadmap, but there's no planning organization just trying to do things left, right and center that doesn't advance government aims that doesn't make sense or they don't even know working there*" [R1].
- Competition for funds : sometimes there are bids for the same money from different partnerships, competing for the same money with different groups because "*it's not like all the groups are going to have one big come together and applied together, I mean, they are going to compete, they're going to have different ideas*". [R2]

8. Communication or miscommunication [R2]
9. Not sharing of common infrastructure (like distribution channel) because they are founded by different donors, especially true in case of horizontal collaboration [R1].
10. Big programs that are very slow: "*size and efficiency as well for me is a big thing, I mean on a big program things were very slowly, a lot of layers to go through you know having a document reviewed for example can take two months, sometimes*." [R2]
11. Workload [R2]
12. Expectations [R2]
13. Public health SC that is very complicated [R1]
14. Partner agencies who work for different objectives: R1 reports the existence of agencies that work in this area but "*they are run as businesses and they are, you know, consultancies who have different demands on them or they have different growth targets etc*".

There are also some context-specific challenges that seems strictly related to the Madagascar environment.

1. Government procedures: in this projects the American government does not recognize the Madagascar one and there were "*no official recognition by US organization$_{B1}$ or Madagascar government*"[R1].
2. Difficult geographical context of Madagascar: targeted villages are among some of the most hard-to-reach in Madagascar.
3. Timing of the introduction of transport activities in relationship with other community health activities needs careful planning.

Outcomes

The respondents list the following qualitative outcomes that makes a collaboration successful:

- Communication [R2]
- Share values [R1]
- Transparency [R1, R2]
- Flexibility in order to "*take into account each other's opinions, thoughts, findings, also schedules*" [R2]
- Valuable contributions of each partner because "*a good collaboration is people know what they're doing, they bring something valuable to the table and clear lines of who's doing what and an escalation if there's issues"*[R1]
- Importance to not underestimate the time needed for collaboration [R1]

Other project-specific outcomes are not released during the interview but retrieved from other primary or secondary sources divided between the two main action areas of this project (CHV and ETS). The data are from qualitative review, routine programme monitoring and evaluation programme system; between September and December 2015.

CHV (community health volunteer) mobility, qualitative outcomes:

- Quality bicycles that CHVs can maintain
- There is some evidence of health service delivery improvements for CHVs with bicycles
- The bicycles motivate CHVs is their work
- Some CHVs report that their cost of transport has reduced since they can now use the bicycle to travel to restock their health commodities
- In more than one region, the review found a link between the perceived social status of CHVs and the possession of a bicycle

ETS (emergency transport scheme), quantitative outcomes:

- Five districts now have emergency transport systems in place
- A total of 151 IMTs have been distributed
- 185,053 people now have access to ETS
- 323 committee members for emergency transport have been trained
- 253 drivers have been trained on emergency transport
- 964 people were transported to a health facility (data between 2014 and March 2016 in the regions of Menabe, SAVA, Sofia and DIANA)

Qualitative outcomes:

- Synergies with mutuelle (community health insurance scheme) and eBox (micro enterprise bicycle sale and repair shop) activities have been created to contribute to sustainability.
- Focus group participants reported that journey times in an emergency, which used to take two hours on foot, now take between one hour and one hour 15 minutes.
- In addition to a reduction in cost, communities reported that it would take between one and three hours to arrange transport before the emergency transport system was in place. Now the ETS is available when needed.

Performance measurement

In the Madagascar project in particular, it is clear that US organization$_{B1}$ imposes its own indicators "*that are measuring the success of the program on, and we [NGO$_{B1}$] will report in to those in a very specific way*."[R1]

In addition to that, R1 points out the importance of choosing and clarifying the success criteria also with the donors itself, from whom the works depends. It is important to "*about sitting down and saying, where we can have an impact, where they need, where the government not going or politics dictating were and then we can*".

In this project it is also present an annual review, as the projects is based on five years' timeline. No other specific information is detailed.

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Horizontal collaboration

In Madagascar project seems from the interview that is not present a real horizontal collaboration between the NGOs or in general the different programs in the country. R2 believes it is opposed by the lack of a coordinating body who tries "*recognizes […] like hey, you're working on supply chain for malaria medication, you're working on supply chain for HIV medication, why don't you talk to each other, and connect*".
In addition to that, the big size of the US organization$_{B1}$ grant ($2 million R2 reports) make the environment *overwhelmed* with many people coming in from all directions *"and it's really hard for them to coordinate the different activity so they're not stepping in and saying yes good idea*".
The solution could be, in opinion of R2 to make alliance and maybe "*get the same supply chain setup, use the same infrastructure*", but in reality everybody is used to "*make their own infrastructure, but only use it for their own project*" [R2].

Collaboration relations map

As described before in 5.2 Findings, from the data of the findings in the different dimensions a map (Figure 5.2) of the relations between the different partners is provided.

As explained, the lines where information is available the main aspect that regards this relation is highlighted: in this case for example the NGO$_{B1}$ provides training to the local association for the transportation side. There are also two relations that are supposed (the two dot lines): the first one is the relation between the consortium (or its partners) and the LNGOs: they are probably in relation with them because they are surely involved in the collaboration. In addition, probably the community health volunteers center organises the transportation of the drivers: they are the final destination of the emergency transportation.

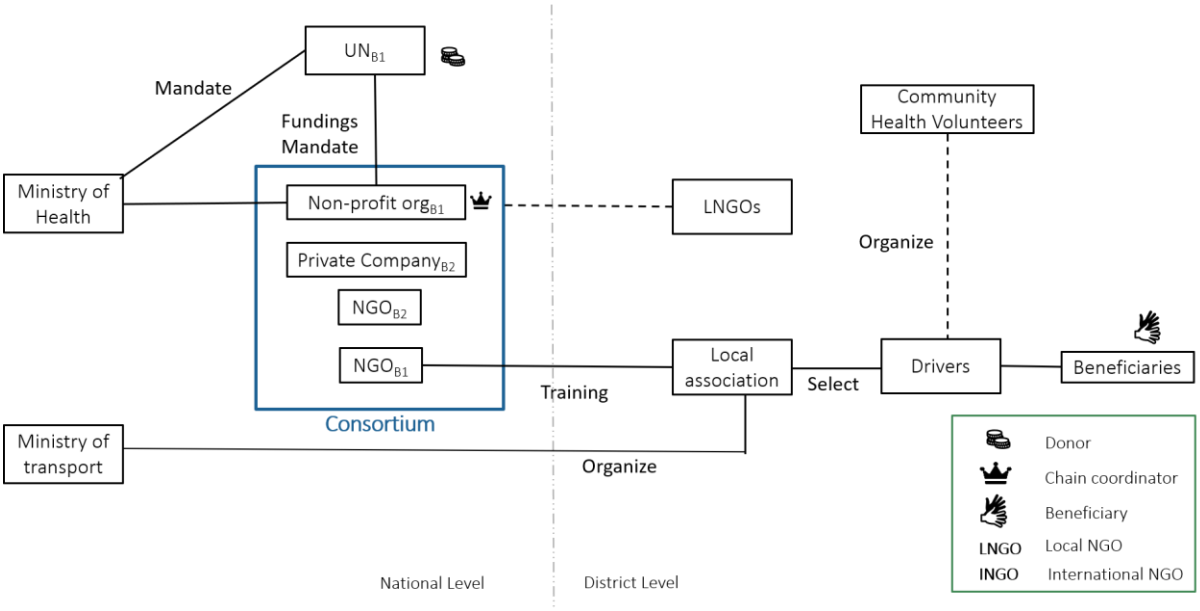

Figure 5.2: Collaboration relations map - Case B

5.2.3 CASE C: Food rations SC

Respondents and company profile

R1: respondent for the UN organization$_{C1}$, Logistic Assistance in Syrian humanitarian operation. R1 past experience in commercial logistics/ freight forwarders but is working on HSC since 2013.

UN organization$_{C/D1}$: is an UN leading humanitarian organization fighting hunger worldwide. It is an INGO that delivers food assistance in emergencies and works with communities to improve nutrition and build resilience. It is a large organization which assist 86.7 million people in around 83 countries each year.

Project Profile

The R1 select a first projects to be representative of a collaboration application, some collaborative details and the aim and a short description of the project are reported in this Table 5.7.

Name	Location	Disaster phase	Time horizon	Aim	Short description
Food Rations SC	14 Syrian governorates	Response and recovery	2011 - ongoing	Provide food assistance to newly displaced people as well as to host families and pre-position stocks.	Large project for distribution of food. It is made up by four specific programs: among them, general food assistance (monthly distribution of rations consisting of rice, bulgur wheat, pasta, dried beans and pulses) and school meals (distribution of milk and high-energy biscuits to schools' students) are the ones included.

Table 5.7: Project C profile

Findings contents

Actors

Eight actors are listed as partners in the collaboration:

1. **Syrian government**: Social Affairs Ministry because the project is related to the distribution of food items
2. **LNGOs** who represent local partners: they distribute food rations
3. **Education Ministry**: due to the school meals programme the schools represent the local partner who distributes the food
4. **LSPs** like shipping line and freight forwarders. Both local and international companies are involved
5. **UN organization$_{C1}$** itself who was also the initiator of the collaboration: it starts to collaborate with the local NGO
6. **Local suppliers**: from other primary data UN organization$_{C1}$ establishes long-term agreements with food suppliers to ensure competitive prices for locally procured commodities.

7. **Donors**: from other primary data it is possible to identify also the largest donors in 2019 ranked by contributions (Germany, USA, Canada, European Commission, Kuwait).
8. **Third- party monitoring company:** due to evaluation reports it is clear the existence of other private companies who monitors and evaluate the UN organization$_{C1}$ works. However no specific information is linked to the projects.

Number of actors

From UN organization$_{C1}$ website is possible to retrieve the size of this collaboration: the organisation speaks about "*over 50 local and international partners*" without specifying the nature of them.

Motivations

The motivations are different based on the **nature and on the actors** themselves. The following matrix (Table 5.8) shows each actor's motivation to collaborate with the partner in the column. Obviously, there are some gaps because the perspective is just the UN organization$_{C1}$'s one.

	WFP	**LNGOs**	**Private companies**
WFP	--	- Cover the huge needs of IDPs - Support the local partner	Cover the huge needs of IDPs
LNGOs	- Cover the needs of IDPs - "*Local NGOs all have different goals, some local NGOs into help people in specific place"*	--	
Private companies	Make profit: *"the aim is offered and make a lot of offers"*		--

Table 5.8: Motivations matrix - Case C

Finally, for what concern the motivations to **end** the collaboration they are not explicit as the project is still ongoing, however as both LNGOs and commercial companies are reviewed each year, UN organization$_{C1}$ could stop the relationship if "*they cannot find any positive results from this project*".

Selection Criteria

Selection criteria

It is interesting to point out that the UN organization$_{C1}$ is the one who selects the partner with specific criteria depending on the actors: LSPs or LNGOs. However, independently from the actors, the partner should submit good services and hard work.

LSPs: are generally selected based on commercial specifications like "*the ability to cover all places in Syria, […] the ability to be flexible also and productivity* […] *ability to own logistics assets such as trucks or warehouses, ability to make some handling for row material, to convert them to put this food rations and to a destination without any delay*"; but also if they have full or appropriate capacity.

LNGOs: in this case there is "*no space to negotiate, because there are a few […] offer local NGO without […] long experience*". However, they "*must always meet international standards of humanitarian organizations and try to do that in an appropriate way*".

In addition, is interesting that after one year generally UN organization$_{C1}$ reviews corporations and decide either to confirm them or not. The partner is evaluated based on its work and "*if there's any hurdles, bottlenecks and find if the local partner […] was implementing projects specification strictly without any delays without any non-transparency […]*".

Cost-benefit analysis

In addition, before entering in the collaboration the interviewee reports that UN organization$_{C1}$ is used to perform a cost-benefit analysis. Indeed, it must perform the analysis to not lose a lot of money, trying "*to select best actors in best area and take best proposals*".

Institutionalization

Regarding the usage of contract, the interviewee confirms the existence of long-term contract with the partners (local NGOs and LSPs), but not additional information is provided. However, these agreements are reviewed yearly.

Activities

Activities

The activities are obviously linked to the actors.

UN organization$_{C1}$: generally speaking, it provides food assistance and it coordinates, executes the distribution of food rations. However, practically often the distribution is performed by LNGOs with different names. In addition, WFP makes need assessment, some specialists "*visit different places, to know realistic needs of beneficiaries and after that they rise their plan, they rise the report, they rise necessary budget to do their future plan*". Finally, UN organization$_{C1}$ also provides training courses for staff of LNGOs. From primary reports, the organisation seems to be involved in warehouses and packaging operations (seven warehouses and five packaging facilities are reported).

Schools: in the case of distribution towards students the "UN organization$_{C1}$*sent this item to school, manager of school receives this item and started to distribute it through students*."
LNGOs: "*in Syrian operation, distribution happened entirely by local NGO*".

SOP

Regarding the existence of standard operating procedures (SOP) to perform activities the interviewee reports generally that "*each humanitarian organisations have its own SOPs […] they are different from one organization to another"*. In the case of UN organization$_{C1}$ the SOP can be different also based on the projects, generally they are related to logistics, handling procedures (to convert raw materials into food rations) or transportation but are not collaborative SOP.

Resource Sharing

Regarding the resources shared, firstly the collaboration's partners are physically exchanging food: food rations, milk and high-energy biscuits for the schools.

Generally, UN organization$_{C1}$ is also sharing with LNGOs logistic assets (like warehouse or trucks), funding and resources, knowledge and also information but probably the ownership of the resources remain to UN$_{C1}$.

Information sharing

In this project it is common the usage of reports between UN organization$_{C1}$ and local partners (LNGOs or schools). They are about "*distribution process, distribution numbers, what that happened, what stockpile, if they [*local partners*] needed to furnish some stockpile and also what they have as future plans*".

The management of information in this case is centralized: Indeed, the interviewee reports that "UN organization$_{C1}$ *and other actors share information",* in a forward and return direction. "UN organization$_{C1}$ *send the information to local partner in contrary, local partner and actors send another information or another information to return to* UN organization$_{C1}$. *So, all these data database it's so important for all actors and* UN organization$_{C1}$ […]". However, among the partners of the collaboration is highly probable that these data are not shared.

Also, when the actors meet during the regular meeting, they share information about the hurdles, bottlenecks faced and the possible mutual solution. While in the negotiation meeting the data shared are more related to the strategic intentions, the goal of humanitarian organisations.

Language

For what concerns the language uses in the communication, the interviewee does not look at it as a barrier because "*in* UN organization$_{C1}$ *there was an international […] officer or […] high senior team manager for* UN organization$_{C1}$*; and also the most of the employees [*are*] from Syrian nationality so they both spoke English and Arabic so they [..] could transfer to highest seniority managers* […]." Also, because most of the LNGOs try to write reports in English language.

Coordination mechanisms and Decision Making:

Coordination mechanisms

It should be underlined the presence of the central coordinator: it is the UN organization$_{C1}$ who coordinates and controls the execution of all the other partners. It also selects, contracts and evaluates the partners. In addition, it owns and controls the resources and information and the possible sharing of them.

In addition, from primary reports it is clear the existence of different clusters in the country. They are probably involved in the project but not specifications have been found. The main important clusters that could be involved are: Logistics Cluster and Emergency Telecommunications Cluster.

In this case there are present "*regularly meetings with partners or actors to discuss support and discuss hurdles or bottlenecks* […] *and to find mutual solution*" and also negotiation meeting "*to explain to another part about the goal of humanitarian organizations*".

Communication tools

UN organization$_{C1}$ commonly asks reports from the LNGOs; then it is frequent to use email, paper hard copies, Excel, telephone calls and even social media (like WhatsApp and Telegram). The interviewee, also, quotes the existence of a sort of database very useful for all the actors.

Decision making

The interviewee reports the central coordinator of the supply chain is UN organization$_{C1}$, who "*coordinate and execute. This is all the operations*". So, it is more on an operational perspective and this is the reason why if a hurdle in terms of logistics happens, the responsible is the supply chain's head of the UN organization$_{C1}$ in Syria.

However, it is also present in terms of decision making the Syrian government who is responsible for coordination with a completly different perspective. Indeed, "*they [*UN organization$_{C1}$*] needed the facilitation […] to move [...] they needed the approve from Syrian Government to enter shipping inside Syria*". The role of the government seems just the approval of the imports/exports' operations.

In addition, the interviewee says that the "*initial collaboration is under the cover of local government, but after that the* UN organization$_{C1}$ *started to, to establish long term […] contract with local transportation or international transportation*". Consequently, it seems that the decision-making changes along the time.

Level

About the level, it can be deduced from other aspects of the collaboration, but not explicit information is available. With LNGOs and LSPs the relationship seems operational, short-term timeliness and depending just on UN organization$_{C1}$ decision because each year, at the end of the year, WFP reviews this cooperation. Also considering the resource and information sharing everything is centralized under the power of UN organization$_{C1}$.

Relationship Dynamics

Regarding this topic the respondent reports that each actor wants to have its own reward: "*all of the parties had expectations and all of them, want to finish the project with big, let's say, big benefits, big added value*". Regarding the balancing of the relationship, no data are available, but it seems clear the decision making is completely unbalanced: the UN organization$_{C1}$ is the one who leads the collaboration and does not involve the other partners in it. Maybe it can be concluded that the relations are unbalanced.

Enablers

The respondent generally highlights as enablers of a successful collaboration the following aspects:

- **each part needs other parties**
- the presence of negotiation
- give to other parties training as they could answer by themselves

Focusing on the first factor the interviewee reports why each actor needs the others:

Commercial companies – they need urgently to "*work with humanitarian organization because they don't have, let's say, a lot of opportunity to work in their local market because there's lack of opportunity, lack of work, lack of level of work in Syria and local markets. So, all commercial company go forward to humanitarian organization because they have a huge skill of work that is, that lead, to huge benefits*."

UN organization$_{C1}$ – it collaborates with commercial actors and humanitarian organisations: firstly, to exploit them in reaching and delivering all beneficiaries and secondly as "UN organization$_{C1}$ *is an international organization but they needed national organization or […] national entities to reach local people*".

Local actors (such as LNGOs) – they needed the "*ability and capacity and resources and funds of* UN organization$_{C1}$ *to make a bigger project to help people and in specific places or people around because they don't have funds, sources and capacity to address huge and enormous needs*".

Challenges

About the challenges, it is interesting that the interviewee answers that they do not depend on the projects; they are mainly three aspects:

- The necessity of governmental approval to ship and deliver inside a country
- The lack of capacity that can creates bottlenecks and supply chain issues (confirmed also from other primary sources)
- The **different expectations** that characterize each actor

Regarding the last factor a deeply explanation is available: each party –in opinion of the respondent – has its own goal and policy expectations and this can create conflicts of interest. In particular, UN organization$_{C1}$ wants to serve honestly the beneficiaries, however commercial companies want to make profit and sometimes, as a consequence, they can "*submit bad service for high prices*". While LNGOs sometimes are not neutral and they try to attract "*lot and a lot of humanitarian aid*

assistance and humanitarian aid project assistance […] [for their] *cousins and, and their friends*" or in general for some specific places.

From the other primary sources other important challenges are identified but they are more specific of the Syrian context:

- the loss of livelihood which is caused by high unemployment rates (especially among women and young people) and the increase of food prices and inflation rate. This is reported also during the interview.
- the long lead times (3-4 months) to procure and import food and the scarcity of it.
- the low timeliness of funding that does not permit precise forecasts.

Outcomes

In this project the interviewee reports a **quantitative outcome**: the number of beneficiaries is roughly "*seven million across Syria in different places*". From other primary sources, the number is differentiated by programme, so it is not directly comparable with the interview's result however, on average, each month the IDPs' target is about 3.5 million.
In a different report also the tons of food assistance are reported: it is around 59,555 mt.

In addition, there are other **qualitative outcomes** although negative: "*in the case of food ration, they have specific components. So, sometimes the beneficiary complaint, [*and then*] complaints from this specific company each months, they have surpluses, of this components*".
The project has also high costs as transportation and delivery of food rations to partners can "*causes sometimes losses in food losses and stolen and sometimes missed items during their journey*".

Performance Measurement

The respondent underlines that UN organization$_{C1}$ measures the **partner performance** when they perform the annual review. At the end of each year they evaluate the partners looking as some performance indicators that are different in function of the actors.

LSPs: some of the indicators for these actors are the following one, they are probably qualitative

- ability to implement a project successfully
- transparency with UN organization$_{C1}$ (for example submit documented covert expenditures)
- satisfactory of beneficiaries or satisfactory of UN organization$_{C1}$ on the services
- ability to cover all conflicts soon
- address the needs of the beneficiaries

Local partner (schools and LNGOs): the respondent reports some qualitative and general indicators also for these partners

- ability to work hardly to cover the needs of beneficiaries in each area
- make necessary reports (distribution process, number, list of stockpile)
- share the future plans
- ability to implement the projects specification
- timeliness

- transparency

Generally speaking, for both the projects, the interviewee answers about **collaboration outcomes indicators** dividing between straight and forward indicators.

Straight indicators: such as
- number of beneficiaries reached
- number of deliveries
- number of delivered items
- satisfactory of final customer or beneficiaries

Forward indicators: they are "*about our project, achieve a good positive results or not*". In general, if the partners and UN organization$_{C1}$ reach the planned goal.

It is interesting that from UN organization$_{C1}$'s reports the organisation is used to perform some on-site monitoring (OSM) checklists in collaboration with third-party monitoring (TPM) companies about the projects results.

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Horizontal collaboration

From other primary sources it seems that horizontal collaboration in the Syrian context exists. For example, the existence of clusters involved the collaboration between different INGOs. Especially the clusters more quoted are the Logistics Cluster and Emergency Telecommunications Cluster, which provide "*logistics and telecommunications support, respectively, to the wider humanitarian community operating in Syria*". In addition, there is a willingness to enhance the horizontal as demonstrated by the strategic outcome desired for the 2020:

• *Provide coordination, information management, capacity development and shared logistics services to sector partners that face logistics gaps.*

• *Provide shared ICT services, emergency telecommunications coordination and information technology (IT) emergency preparedness training to humanitarian organizations in common operational areas.*

• *Provide technical assistance and support services to humanitarian partners.*

Collaboration relations map

As explained in 5.2 Findings, from the data of the findings in the different dimensions a map (Figure 5.3) of the relations between the different partners is provided.

The dot lines represent supposed relations: here it seems reasonable that the LSPs are the ones who distribute the products to the schools or the local NGOs. As explained in the lines where information is available the main aspects that regards this relation are highlighted: here for example the local supplies are collaborating with UN$_{C1}$ mainly to provide the food supplies, or the Social affair Ministry gives the permission to the central coordinator.

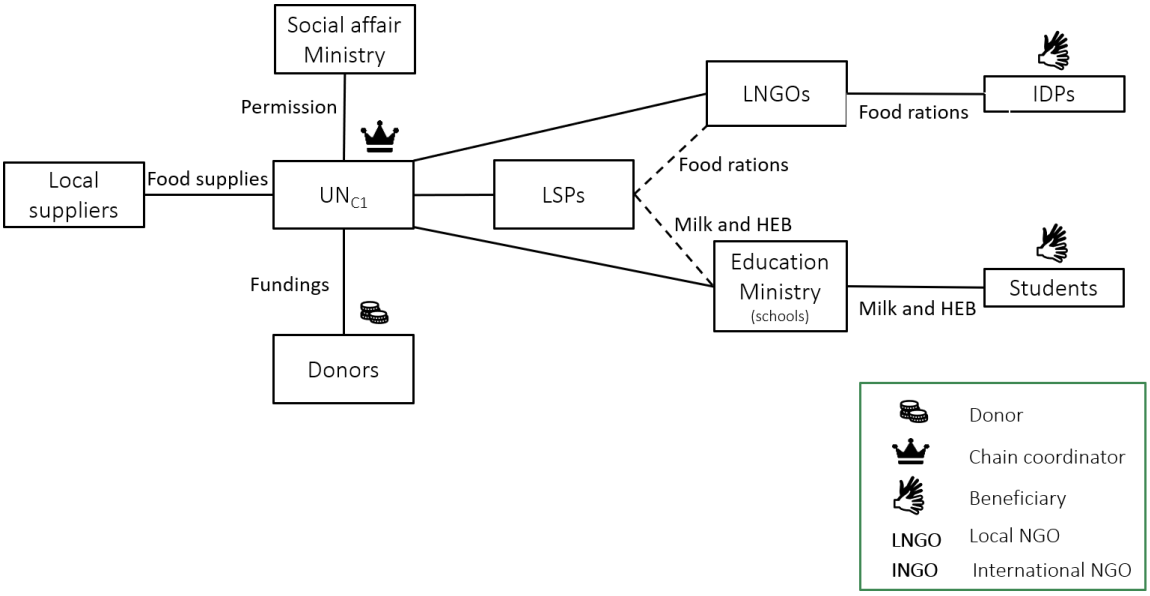

Figure 5.3: Collaboration relations map - Case C

5.2.4 CASE D: Cashed based assistance SC

Respondents and company profile

R1: respondent for the UN organization$_{D1}$, Logistic Assistance in Syrian humanitarian operation. R1 past experience in commercial logistics/ freight forwarders but is working on HSC since 2013.

UN organization$_{C/D1}$: is an UN leading humanitarian organization fighting hunger worldwide. It is an INGO that delivers food assistance in emergencies and works with communities to improve nutrition and build resilience. It is a large organization which assist 86.7 million people in around 83 countries each year.

Project Profile

The R1 select a second projects to be representative of a collaboration application, some collaborative details and the aim and a short description of the project are reported in this Table 5.9.

Name	Location	Disaster phase	Time span	Aim	Short description
Cash based assistance SC	Syria	Recovery	2017-ongoing	Provide nutrition support to pregnant women and nursing mothers.	Part of the nutrition program in Syria emergency. Here, pregnant and lactating woman receive monthly cash vouchers to purchase fresh food (such as vegetables, dairy and meat) from UN ORGANIZATION$_{D1}$-contracted medium and large supermarkets. In this way they can diversify their diet, promote the healthy development of their babies and decrease the risk of malnutrition.

Table 5.9: Project D profile

Findings contents

Actors

In this project there are mainly six actors

1. Syrian **government**: Social Affairs Ministry
2. **LNGO**s: collect the data and the needs of pregnant women, distribute cash vouchers
3. Medium and big **supermarkets**: according to secondary sources they are 84 contracted shop where pregnant women with cash vouchers can purchase fresh food.
4. **Local manufacturers** of plastic vouchers
5. **UN organization$_{D1}$** itself who was also the initiator of the collaboration
6. **Third- party monitoring company:** due to evaluation reports it is clear the existence of other private companies who monitor and evaluate the UN organization$_{D1}$ works. However no specific information is linked to the projects.

Motivations

The motivations are different based on the **nature and on the actors** themselves. The following matrix (Table 5.10) shows each actor's motivation to collaborate with the partner in the column. Obviously, there are some gaps because the perspective is just the UN organization$_{D1}$'s one. In this project, the beneficiaries are a specific minority of the population: the pregnant and lactating women.

	WFP	**LNGOs**	**Supermarket-manufacturers**
WFP	--	- Cover the women's needs - Support the local partner	Cover the women's needs
LNGOs	- Cover the needs of women - *"Local NGOs all have different goals, some local NGOs into help people in specific place"*	--	
Supermarket-manufacturers	Make profit and exploit their unused local working capacity		--

Table 5.10: Motivations matrix - Case D

Finally, for what concern the motivations to **end** the collaboration they are not explicit as the project is still ongoing, however as both LNGOs and commercial companies are reviewed each year, UN organization$_{D1}$ could stop the relationship if "*they cannot find any positive results from this project*".

Selection Criteria

It is interesting that after one year generally UN organization$_{D1}$ reviews corporations and decide either to confirm them or not. The partner is evaluated based on its work and "*if there's any hurdles, bottlenecks and find if the local partner […] was implementing projects specification strictly without any delays without any non-transparency […]*".

In addition, before entering in the collaboration the interviewee reports that UN organization$_{D1}$ is used to perform a cost-benefit analysis. Indeed, it must perform the analysis to not lose a lot of money, trying "*to select best actors in best area and take best proposals*".

Institutionalization

The private supermarkets are, from other primary sources, contracted. It seems reasonable that real formalized agreements exist for the relation between UN_{D1} and the supermarkets.

Activities

Activities

Also, in this case it is possible to identify the activities carried out by each actor:
LNGOs: they are the local partner that receive the pregnant women and rise the needs; through a report they bring back the needs directly to UN $organization_{D1}$. Later on, they are also responsible for the distribution of plastic voucher to the identified beneficiaries.
UN $organization_{D1}$: they receive the needs and they derive how many plastic vouchers should be produced, after receiving this voucher they send them to the LNGOs. Probably they also track the usage of these plastic vouchers.
Local manufacturers: they are local companies who produce plastic vouchers customizing them with personal data (such as woman name, age, amount of cash…).
Supermarkets: they are the pre-defined places where women can purchase fresh food with the cash vouchers. They probably supply and storage the foods.

SOP

Regarding the existence of SOPs to perform activities the interviewee reports generally that "*each humanitarian organisations have its own SOPs […] they are different from one organization to another"*. In the case of UN $organization_{D1}$ the SOP can be different also based on the project, generally they are related to logistics, handling procedures (to convert raw materials into food rations) or transportation but are not collaborative SOP.

Resource Sharing

Firstly, the resource that is shared is the plastic voucher itself.

Generally, often UN $organization_{D1}$ is sharing with LNGOs logistic assets (like warehouse or trucks), funding and resources, knowledge and also information but probably the ownership of the resources remain to UN_{C1}.

Information sharing

In this second project, UN $organization_{D1}$ gains different type of information from LNGOs. In particular, "*each pregnant woman go to local NGO register his name or her name and ask humanitarian assistance. So local NGO rises its needs, so rises were official report to* UN $organization_{D1}$. UN $organization_{D1}$ *makes some plastic voucher and send it to local NGO*".

In addition to that, UN $organization_{D1}$ shares with the manufacturers of plastic vouchers some data to customize the voucher: "*her details, her name, her age, […] what she needed exactly, the amount of cash assistance and subsidizes*".

The management of information in this case is centralized: Indeed, the interviewee reports that "UN organization$_{D1}$ *send the information to local partner in contrary, local partner and actors send another information or another information to return to* UN organization$_{D1}$. *So, all these data database it's so important for all actors and* UN organization$_{D1}$ […]". However, among the partners of the collaboration is highly probable that these data are not shared.

Also, when the actors meet during the regular meeting, they share information about the hurdles, bottlenecks faced and the possible mutual solution. While in the negotiation meeting the data, shares are more related to the strategic intentions, the goal of humanitarian organisations.

Language

In addition to that, for what concerns the language uses in the communication, the interviewee does not look at it as a barrier because "*in* UN organization$_{D-C1}$ *there was an international […] officer or […] high senior team manager for* UN organization$_{D-C1}$*; and also the most of the employees [*are*] from Syrian nationality so they both spoke English and Arabic so they [..] could transfer to highest seniority managers* […]." Also because most of the LNGOs try to write reports in English language.

Coordination mechanisms and Decision Making

Coordination mechanisms

It should be underlined the presence of the central coordinator: it is the UN organization$_{D1}$ who coordinates and controls the execution of all the other partners. It also selects, contracts and evaluates the partners. In addition, it owns and controls the resources and information and the possible sharing of them.

In addition, from primary reports it is clear the existence of different clusters in the country. They are probably involved in the project but not specifications have been found. The main important clusters that could be involved are: Logistics Cluster and Emergency Telecommunications Cluster.

In this case there are present "*regularly meetings with partners or actors to discuss support and discuss hurdles or bottlenecks* […] *and to find mutual solution*" and also negotiation meeting "*to explain to another part about the goal of humanitarian organizations*".

Communication tools

UN organization$_{D1}$ commonly asks reports from the LNGOs; then it is frequent to use email, paper hard copies, Excel, telephone calls and even social media (like WhatsApp and Telegram). The interviewee, also, quotes the existence of a sort of database very useful for all the actors.

Decision making

The central coordinator of the supply chain is UN organization$_{D1}$, who "*coordinate and execute. This is all the operations*". So, it is more on an operational perspective and this is the reason why if a hurdle in terms of logistics happens, the responsible is the supply chain's head of the UN organization$_{D1}$ in Syria.

However, it is also present in terms of decision making the Syrian government who is responsible for coordination with a completly different perspective. Indeed, "*they [*UN organization$_{D1}$*] needed the facilitation […] to move [...] they needed the approve from Syrian Government to enter shipping inside Syria*". The role of the government seems just the approval of the imports/exports' operations.

In addition, the interviewee says that the "*initial collaboration is under the cover of local government, but after that the* UN organization$_{D1}$ *started to, to establish long term […] contract with local transportation or international transportation*". Consequently, it seems that the decision-making changes along the time.

Relationship Dynamics

Regarding this topic the respondent reports that each actor wants to have its own reward: "*all of the parties had expectations and all of them, want to finish the project with big, let's say, big benefits, big added value*". Regarding the balancing of the relationship, no data are available, but it seems clear the decision making is completely unbalanced: the UN organization$_{D1}$ is the one who leads the collaboration and does not involve the other partners in it. Maybe it can be concluded that the relations are unbalanced.

Enablers

The respondent generally highlights as enablers of a successful collaboration the following aspects:

- **each part needs other parties**
- the presence of negotiation
- give to other parties training as they could answer by themselves

Focusing on the first factor the interviewee reports why each actor needs the others:
Commercial companies – they need urgently to "*work with humanitarian organization because they don't have, let's say, a lot of opportunity to work in their local market because there's lack of opportunity, lack of work, lack of level of work in Syria and local markets. So, all commercial company go forward to humanitarian organization because they have a huge skill of work that is, that lead, to huge benefits*."
UN organization$_{D1}$ – it collaborates with commercial actors and humanitarian organisations: firstly, to exploit them in reaching and delivering all beneficiaries and secondly as "UN organization$_{D1}$ *is an international organization but they needed national organization or […] national entities to reach local people*".
Local actors (such as LNGOs) – they needed the "*ability and capacity and resources and funds of* UN organization$_{D1}$ *to make a bigger project to help people and in specific places or people around because they don't have funds, sources and capacity to address huge and enormous needs*".

Challenges

About the challenges, it is interesting that the interviewee answers that they do not depend on the projects; indeed, they are mainly three aspects:

- The necessity of governmental approval to ship and deliver inside a country
- The lack of capacity that can creates bottlenecks and supply chain issues (confirmed also from other primary sources).
- The **different expectations** that characterize each actor

Regarding the last factor a deeply explanation has been provided: each party –in opinion of the respondent – has its own goal and policy expectations and this can create conflicts of interest. In particular, UN organization$_{D1}$ wants to serve honestly the beneficiaries, however commercial companies want to make profit and sometimes, as a consequence, they can "*submit bad service for high prices*". While LNGOs sometimes are not neutral and they try to attract "*lot and a lot of humanitarian aid assistance and humanitarian aid project assistance […]* [for their] *cousins and, and their friends*" or in general for some specific places.

From the other primary sources other important challenges are identified but they are more specific of the Syrian context:

- the loss of livelihood which is caused by high unemployment rates (especially among women and young people) and the increase of food prices and inflation rate. This is reported also during the interview.
- the long lead times (3-4 months) to procure and import food and resources scarcity.
- the low timeliness of funding that does not permit precise forecasts

Outcomes

In this project the interviewee answer with a **quantitative outcome**: the number of beneficiaries is "*maybe around 300,000*, [but] *well, not sure yet, because it's pregnant women*". In this case the other primary sources should be more comparable and in one of the most recent report the number of pregnant and lactating women is around 57,300 (probably monthly).

While considering the **qualitative outcomes**, the cash voucher projects has positive results for each of the actors involved:

- Beneficiaries: their satisfaction is higher as they can purchase exactly what they need.
- Commercial entities: are happier as they can produce more and obtain clients
- LNGOs: they have less risks because they can stay in the office and not go in the field to make need assessment.

Generally, the cash voucher approach encourages the local market and seems more "*appropriate and flexible in case of humanitarian aids*". Indeed, it has less costs for all the actors: "*less costs of logistic, less airports, less losses*" compare to food rations.

Performance Measurement

The interviewee answers about **collaboration outcomes indicators** dividing between straight and forward indicators.

Straight indicators: such as
- number of beneficiaries reached
- number of deliveries
- number of delivered items
- satisfactory of final customer or beneficiaries

Forward indicators: they are "*about our project, achieve a good positive result or not*". In general, if the partners and UN organization$_{D1}$ reach the planned goal.

It is interesting that from UN organization$_{D1}$'s reports the organisation is used to perform some on-site monitoring (OSM) checklists in collaboration with third-party monitoring (TPM) companies about the projects results.

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Horizontal collaboration

From other primary sources it seems that horizontal collaboration in the Syrian contexts exists. For example, the existence of clusters involved the collaboration between different INGOs. Especially the clusters more quoted are the Logistics Cluster and Emergency Telecommunications Cluster, which provide "*logistics and telecommunications support, respectively, to the wider humanitarian community operating in Syria*". In addition, there is a willingness to enhance the horizontal as demonstrated by the strategic outcome desired for the 2020:

• *Provide coordination, information management, capacity development and shared logistics services to sector partners that face logistics gaps.*

• *Provide shared ICT services, emergency telecommunications coordination and information technology (IT) emergency preparedness training to humanitarian organizations in common operational areas.*

• *Provide technical assistance and support services to humanitarian partners.*

Collaboration relations map

As explained in 5.2 Findings, from the data of the findings in the different dimensions a map (Figure 5.4) of the relations between the different partners is provided.

As explained in the lines where information is available the main aspects that regards this relation are highlighted: here for example the supermarkets have a relation with the beneficiaries mainly related to accept the cash vouchers and provides the food. Or for example UN$_{C1}$ has a relation with the LNGOs mainly providing the vouchers but also receiving and giving the information (information sharing dimensions).

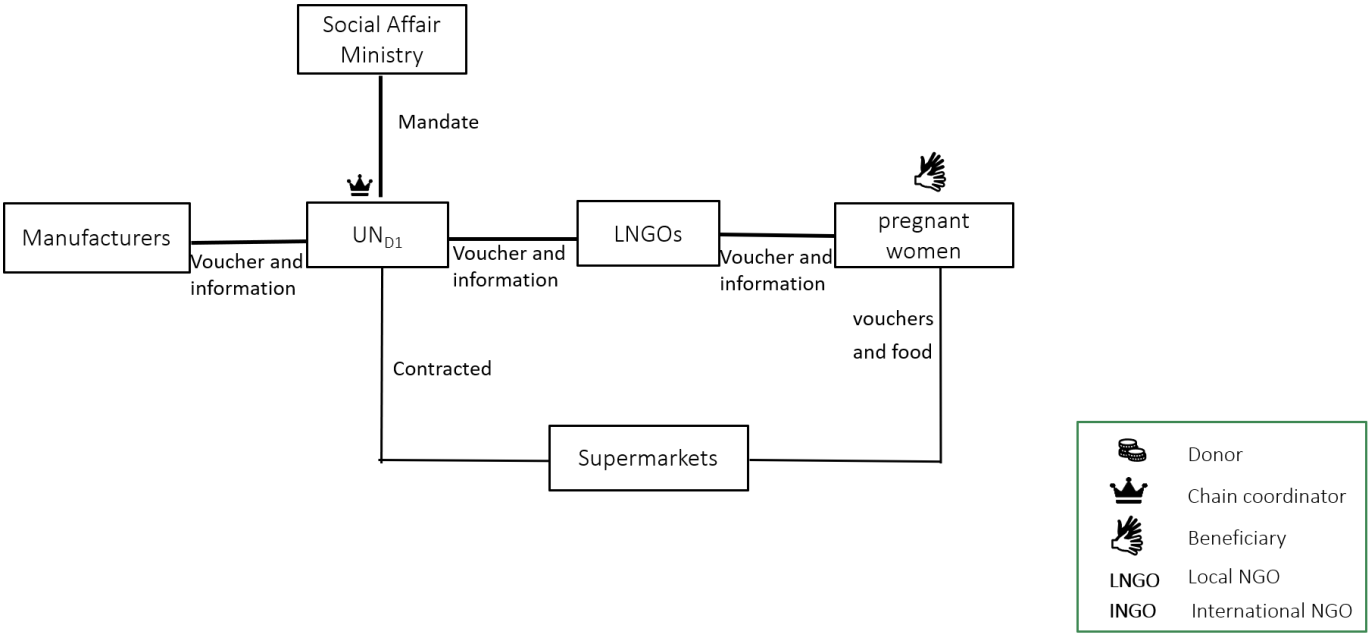

Figure 5.4: Collaboration relations map - Case D

5.2.5 CASE E: Survival kits pre-positioning

As highlighted in the data collection (5.1.2 Primary documents and reports) the findings of this case are retrieved just from the interview content because it is not possible to find other primary or secondary sources related to this project.

Respondents and company profile:

R1: He has been the head of freight forwarding and project logistics in East Africa for PS_{E1} (2009 – 2012). He has an engineering and logistics background.

PS_{E1}: It is one of the world's top freight forwarding and contract logistics providers working in more than 100 countries. It is a pioneer in emerging markets building trade infrastructures. It has local subsidiaries all around the world.

Projects profile:

Name	Location	Disaster phase	Time span	Aim	Short description
Survival kits pre-positioning	Kenya	Preparedness	It lasts 1 year and a half. Probably it started between 2008 to 2010	It is twofold: firstly, these kits could be used for rapid response to any regional emergency; secondly, the business model aims to encourage manufacturers to produce these items to encourage local economy.	The project consists of the production and position of survival kits in Kenya. These kits are basically bags to ensure the basics for the survival of a refugee family (blankets, kitchen sets, hygiene kits, jerry cans etc).

Table 5.11: Project E profile

Findings contents

Actors

Actors and roles

PS_{E1}: is a publicly traded global logistics company headquartered in Kuwait, providing freight forwarding, transportation, warehousing and supply chain management services to businesses, governments, international institutions and relief agencies worldwide.
Role: it provides free of charges services of pre-warehousing for the supplies, a warehouse for the kits and probably funding and expertise.

NGO_{E1}: It is an INGO which operates all around the world. Their mission in Kenya is the identification of solutions to provide children health, education, food, water and to solve sanitation challenges.

Role: it finances itself the project (pre-financing) it is involved in the distribution and warehouse.

NGO_{E2} : It is an INGO, a US catholic organization and their mission is to assist the poor and vulnerable overseas.
Role: It finances itself the project (pre-financing) but it is involved in the distribution and warehouse.

NGO_{E3}: is a locally registered NGO in Kenya, but the trustees of the NGO are British.
Role: It is the initiator of the project and It finds investors and finance itself the project; it facilitates the discussions with the government, it is the central coordinator.

Local companies:
Role: they are manufacturers or suppliers for the items of the survival kits.

Local government:
Role: It allows private companies to operate in the Export Processing Zone and to make the manufacturers produce the goods and to stock them paying less duties and taxes.

Procurement agent: R1 just mentions this actor without provide additional information about it
Role: It worked between the PSs manufacturers and NGO_{E3}

Number of actors

R1 asserts that this project is as more successful as more NGOs are part of it because higher is the number of partners and lower should be the capital invested to pre-finance the stocks, in the pooling of resources. The lower pre-financing permits to have a lower risk. In addition, the presence of a higher number of actors permits to create a higher demand: the result is a higher stock rotation. At the end a higher number guarantee a long-term economic sustainability.

Motivations

The interviewee refers to the motivation to collaborate differentiated by actors:

NGO: The reason to collaborate with many local NGO's is, as said in the number of actors, the creation of demand and more capital available.
PS_{E1}: "*One of the mistakes that was made by the people who conceived it was assuming that a Promotion logistics provider, in this case my employer you know would be satisfied only with the reputational positive impact",* PS_{E1}'s expectations, instead, are also *"to participate in other elements of the supply chain".* So, we can conclude that PS_{E1} collaborates to improve its CSR but, at the same time, it wants to be part of the HSC itself and to scale.

PS: In general the private sector motivations to collaborate are in opinion of R1 not just CSR motivations but, in the end, it should be win-win also from a business side.

Finally, R1 explains that the collaboration was open-ended: it stops when it does not produce results, so when there was no stock rotation anymore. It can be reported that the stop of stock rotations is caused by the presence of a low number of NGOs: they are the ones that permits the long-term sustainability of the project. On the other hand it seems that also the donors stop the funding of the project.

Selection criteria

The majority of the actors are identified and involved by the central coordinator, NGO_{E3}.
One leading criterion to select partner is to work with the actors who have already be partners. In addition, generally speaking about collaboration in the response phase, the respondent refers also to some possible reasons of this choice: *"There are people who know each other who are responding together, then they collaborate more. If they if they are people, you know, who are not known to each other on the ground, they will not collaborate […]".*
Anyway, the respondent mentions that in the collaboration project also unknown NGOs working in *"different thematic areas"* can take part.

A challenge in finding adequate NGOs partners are the requirements necessary to perform the pooling of resources: R1 mentions the need of a large capital investment to pre-finance the resources and in order to share efficiently the warehouse and the stocks the presence of standardized items shapes.

Institutionalization

Regarding this dimension, R1 says that they use just simple agreement and not high levels of formalization.

The agreements are mainly the commercial ones with private companies and related to price and commercial obligations not about Service Level Agreement (SLA) or about the definition of roles and responsibilities.

The agreements are stronger on the purchasing side (NGO_{E3} - manufacturers); nonetheless there are contracts also on the distribution side for example to regulate the pre-finance of the INGOs. The respondent specifies that these contracts are not very complex in general, neither in terms of responsibilities of the international NGOs but they are present. The usage of highly formalized contracts seems not useful for R1, especially on the resource sharing side: the NGOs could be *"scared"* by formalizing the pooling of resource as *"it introduces some element of supply chain risk in terms of availability and who gets first access".*

Activities

SOP

R1 asserts that the SOPs *"were largely left to each actor"*. Furthermore, the respondent identifies as a challenge for the collaboration the lack of standardization (in terms of shape of the commodities and products in the kits) that exists across the sector.

However, in a different point of the interview R1 remarks that in this project there is a standard shape of the kits that permits a higher logistic efficiency: *"it was in the form of a cube, which was I think roughly kind of the dimensions […] a kind of a carry bag, but in the shape of a few, so, very logistically efficient to store and transport as well."*

Responsible

R1 says that there is not a centralization of the logistics activities. This *has "led to a lot of missed commercial opportunities for the CSR logistics"* because it would *"made it more financially viable and sustainable for the logistics company to also be able to continue backing this, this project".*

The interviewee remarks that the centralization of the activities (that is the presence of kind of steering or advisory groups responsible for each function of the SC) depends on the *"the caliber and the nature of logistics company or partner*". In this project, even if the African SC is not extremely complex technically, there are not "*very integrated companies* [high level of centralization] *which offer into in logistics and supply chain solutions*". The reason is due to the large magnitude of funds required for this type of centralization.

Activities

R1 mentions the activities performed along the supply chain, here it is reported the information provided about each activity:

- Finance: NGO_{E1}, NGO_{E2} finance the supplies and probably also NGO_{E3}
- Supply: purchasing items for the survival kits
- Manufacture: some items present in the kits are manufactured directly
- Assembly: all the items are then assembled in the survival kits
- Distributors: the kits need to be distributed inside the country and also (in small quantities) exported. Probably they are managed by the NGOs.
- Storage: PS_{E1} provides pre-warehousing for the supplies. Some of the storage is in containers which are donated and then placed in an open yard. The NGOs are involved in the warehousing of the final kits.
- Training: the local community has trained to perform the previous activities such as manufacture, assembly, warehouse, kitting.

Resources sharing

R1 identifies two main pooling of resources in the collaboration:

Warehouses: R1 says that two NGOs are using the same warehouse, in addition the interviewee says that "*in an ideal world, if they having many NGO partners, they will not have each had to, you know, hold an have a warehouse to hold these stocks*". It is not clear if R1 is referring to a contrast between the idea and the reality (the actors involved in the collaboration do no not practically share the warehouse apart from the two NGOs) or if the respondents is referring to a possible wider implementation of this pooling that had not taken place. In any case it is clear that PS_{E1} shares its warehouse with the NGOs.

Stocks: the stocks are not earmarked for the specific NGOs, but they are *write stocks* and everybody can use them. This decreases the needed capacity and the logistics management.

In addition, there is a third and fourth sharing that may be taken place:
Human resources: R1 states that they do not pool human resources apart from the warehouse's one.
Expertise: the PS_{E1} is sharing its business expertise. Indeed, for example the new business model, that is protagonist of this collaboration, is typical of the private sector and the knowledge of the private company is surely shared with the other NGOs involved.

Information sharing

About the management of the information, R1 explains that each actor shares with NGO_{E3} as a central coordinator but not with the other actors. So NGO_{E3} is the only one who has visibility on all the aspects of the supply chain. In addition, the interviewee provides a personal opinion about the sharing of the resources in the collaboration: *"I think collaborative planning, forecasting and replenishment is a proven model that gives better results than the traditional silos-based information sharing. Yeah, so as far as my concerned, I'm a believer in much more open sharing of this kind of information across the supply chain".*

R1 suggests that in this project probably the unwillingness to share information is due to commercial sensitivities (such the financial margins involved) which prevents also the creation of steering group with the different stakeholders. However, only open communication enables the success of the collaboration.

Coordination mechanism - Decision making

Coordination mechanism

R1 asserts that NGO_{E3} is the central coordinator in the collaboration. It plays the following roles:

- It coordinates the stakeholders and the activities
- It is the initiator of the collaboration
- It signs up the INGO partners who finance the supplies and the distributors to give the kits to the beneficiaries when the needs arise
- It identifies PS_{E1}
- It is a facilitator of the collaboration: it convinces the investors to manufacture locally and it facilitates the discussions with the government
- It is responsible of decision making, indeed *"they had the final say"* because *"they held the commercial risk"*
- It is the only one with visibility on the supply chain information

The characteristics of the central coordinator seems bring to an unbalanced relation between the partners and the respondent states that the creation of steering groups would have facilitate the collaboration. However, in this project they are not created them because of the unwillingness of the actors to share commercial sensitivities.

Communication tools

R1 indicates email and "*regular coordination meetings*" as main mechanisms to share information and communicate. About this, it is to be considered that most of the stakeholders are physically present in Kenya and this type of communication is possible.

Level

This dimension is not explicitly addressed during the interview, however the relation between the private company$_{E1}$ and the other NGOs seems more on a strategic level: they share resources, expertise and the motivation is CSR.

However, it should be underlined that the respondent doubts about the fact that *"the* [project] *collaboration resulted in massive significant move new relationships".* Maybe it is a result of the pilot aim of this project, but it does not guarantee a long-term relation. No other information is available on this dimension.

Relationships dynamics

Unbalance

When asked about the balance of the relationship, R1 answers that maybe a steering group would have been useful because there is a lack of communication among the partners. As said, the reason of this lack in is due to the presence of commercial sensitives. Consequently, this answer may classify the relation as unbalanced, at least in terms of information sharing; the central coordinator, indeed, is the only one who is informed of everything.

Individual costs and revenues

In general, for all the parties, R1 reports that from the project everybody gains "*quite a lot of good publicity […] a lot of learning as well* […]". R1 mentions some of the individual costs and revenues of PS_{E1}: even if it is providing pre-warehousing services free of charge, PS_{E1} has not afford huge costs for the company. It earns in terms of reputation and publicity.

Enablers

Involvement of the local government: The local government enables to the companies to produce without paying duties and taxes and to operate in the Export Processing Zone to export the production also outside Kenyan borders.

Private sector: R1 considers the involvement of the private sector as a driver of cost efficiency. On one hand because reputational and CSR private sector's aims make the companies more focused on measuring the sustainable metrics. On the other hand, because private sector enables a cheaper access to warehouses' services.

Relationships: Generally speaking, about the collaboration in the response phase, R1 asserts that *"There are people who know each other who are responding together, then they collaborate more. If they if they are people, you know, who are not known to each other on the ground, they will not collaborate".*

Challenges

Pre-financing: The higher is the number of NGOs involved, the higher is the stock rotation and so the success of the collaboration. But NGOs should have enough resources to invest in stock holdings to take part to the project. So, the availability of these pre-finance resource is a challenge to the success of the collaboration.

Lack of standardization: The lack of standardization of the items across the sector is considered a challenge by R1.

Lack of centralization of logistic activities: R1 asserts that the lack of a responsible of the logistics activities has led *"to a lot of missed commercial opportunities for the CSR logistics partner"* and that *"it would have, you know, made it more financially viable and sustainable for the logistics company to also be able to continue backing this, this project".*

Resistance to change: The project wants to challenge the inefficient African system. But there is not enough critical mass to disrupt the whole industry because there is resistance to change due, for example, to the persistence of the old traditional models of aid delivery. In addition, R1 says that *"very unplanned and a very immature system in place, but that is the level of professionalization of the sector as a whole. It just hasn't reached the levels of business maturity in terms of, you know, operational efficiencies that it is capable of".* This assertation seems to be referred to the African logistics sector which is not mature enough to look for efficiency.

Reputation: R1 recognizes that NGOs' sector disincentivizes the models of procurement which are not "*black or white*" in terms of involvement of the private sector because they are seen as suspicious. Indeed humanitarian organizations are scared of involving private sector to not loose neutrality reputation.

NGOs strategic view: When asked if the lack of donation could pull the pooling of the resources, R1 assert that NGOs are not *"long term in their thinking in terms of survival"* and so they are not concerning to become more *"efficient as operational business".* So, it seems that the lack of long-term view prevents the pooling of resources even when the donations are few. Generally speaking, the issue is that aid agencies are not focused on higher efficiency (especially in terms of costs) because they are used to exploit the donors' money and so they tend to have *"less rigor"* because in that case the perception is that *"money is not money".*

Outcomes

Quantitative

The respondent cannot remember very well the number of the people served by the project. A roughly estimate is about 20,000 beneficiaries for the survival kits.

R1 highlights also the improvement of efficiency and the decreasing of the cost thanks to the manufacturing/supplying process in Kenya as a outcomes of the collaboration project because: *"[…] if the supplies are not being in Nairobi, will cost a lot more because they would have been flown in an expensive and charges".*

In addition, PS_{E1}offers free of charge pre-warehousing services open yard and a focus on cost efficiency. This is an advantage of involving private sector, otherwise in the aid sector warehousing could cost five or six times more.

Qualitative

R1 states that a first outcomes of the project in general is the *"attempt to challenge a very inefficient and broken system"*. Indeed, the logistic system in Africa is operational and not integrated, a completely inefficient system that needs to be enhanced.

In addition, from the conversation other two collaboration outcomes emerge:
Creation of jobs and training: The collaboration created new jobs opportunities. So, workers are trained and upskilled in distribution, assembly and manufacturing activities.
Reputational impact: It has a reputational positive impact in terms of CSR, for $PS_{E1}$and the other companies involved.

Performance measurement

KPIs

The most significant successful metric of the whole collaboration is the stock rotation defined as "*how many times in the year were the supplies going to be distributed and replenished*". Nonetheless, R1 adds that this success metric is not *"formally documented"*, it is more *"a common understanding about what they have to achieve".* For this reason, the collaboration ends when there is no stock rotation anymore.
In addition, the respondent says that there are not established common KPIs and goals, but each organization has its own ones and the other actor have no visibility on such metrics.

Risk assessment

Nonetheless, the interviewee remarks that being involved in the collaboration implies also many risks (such as NGOs' pre-financing, block up the warehouses, setting-up an office for the procurement agent, etc). Especially R1 underlines the presence of a supply chain risk introduced by the pooling of resources (everyone can use the write stocks and so there is the possibility that who gets first access take them or there is no availability anymore).

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Collaboration relations map

As explained in 5.2 Findings, from the data of the findings in the different dimensions a map (Figure 5.5) of the relations between the different partners is provided.

As explained in the lines where information is available the main aspect that regards this relation is highlighted: here for example the PS_{E1} share the warehouse activity with the other NGOs. In

addition, the three NGOs and the PS_{E1} are not explicitly in a consortium but the dynamics and the structure can justify the supposition of a consortium (dot line).

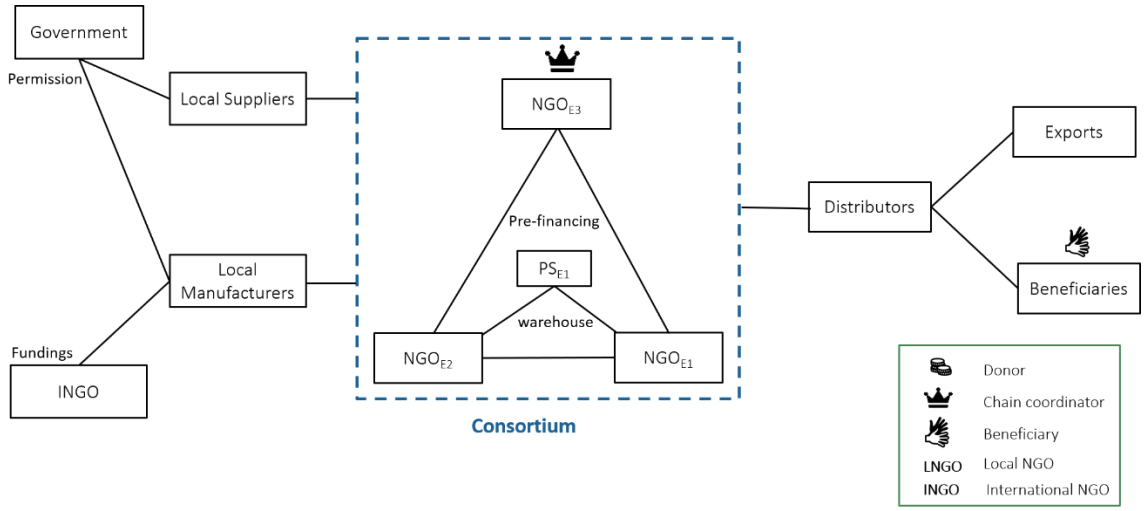

Figure 5.5: Collaboration relations map - Case E

5.2.6 CASE F: Hurricane Dorian Response SC

Respondents and company profile:

R1: He is CEO of PS_{F1}. He is an experienced manager with a demonstrated history of working in the hospitality industry.

PS_{F1}: it is a non-profit, non-political corporate body of businesses and professionals, whose primary focus is protecting Bahamian commerce. It is a bridge between private and government sector in initiatives that drive and support local economic development and growth.

Projects profile:

Name	Location	Disaster Phase	Time span	Aim
Dorian response Supply Chain	Abaco Islands (especially Marsh harbor) and Grand Bahama Island – Bahamas	Response	1st September 2019 – ended (not precise information)	Respond to the most powerful hurricane ever recorded to hit the Bahamas: nearly every building in Marsh Harbour was damaged or destroyed. Some disappeared entirely. Dorian left Abaco and parts of Grand Bahama with no electricity, no running water, no banks, no grocery stores or gas stations.

Table 5.12: Project F profile

Findings contents

Actors

Actors and roles

Private sector: The companies which participate to the disaster relief are local companies with international connections. They belong to different sectors such as bikes, furniture, construction, water companies, food stores, food warehouses, etc.
PS_{F1} is the formal representative of the companies involved.
Role: They put a lot of resources in the relief efforts, in particular, in the first weeks they are the main actors of the relief. R1 asserts that in this phase private sector *"led the initial response"* so they can be classified as the real initiator.

Government: It starts to help after some weeks.

There are many different governmental agencies involved such as:

NEMA: It is the Bahamian National Emergency Management Agency. NEMA takes charge of the decision making after three or four weeks, once the NGOs were on the ground. It is defined as the central coordinator.

US Coast Guard, US Customs and Border Patrol: They provide resources such as helicopters

International NGOs: They take part to the relief because the scale of Dorian is large, so it is necessary the involvement of many monetary and human resources. Among them there is:
NGO_{F1}: It is a global humanitarian organization empowering people to recover from crisis.
Role: They provide basic humanitarian needs
NGO_{F2}: It is a non-profit devoted to providing meals in the wake of natural disaster, it has teams stationed in the Bahamas and Florida that are ready to begin cooking as soon as the storm passes.
Role: They serve meals to the local people

Local NGOs

Private donors: R1 mentions the donations from individuals who "*flew their private planes to the islands*", and donated fuel.

Militaries: After the 3rd week also the military of some foreign countries (Canada, Great Britain, Germany, Jamaica, Netherlands, Bahamas) take part to the relief operations.

Volunteers: There are people who voluntary take two or three weeks of vacation to work in the evacuation center processing people movements at the airport.

Number of actors

Dorian was a large-scale disaster, so the actors and the resources involved in the relief are many.

Motivations

When asked about the motivations that pushed the actors to collaborate, R1 answers that the scale of Dorian is the main reason for them to stay together. In addition, the respondent specifies that the private sector starts to help because it has a "*basic inclination*" towards its community and it is the only entity able to respond since the beginning. The quick engagement of the private companies has permitted to respond immediately even without waiting the arrival of the INGOs or the government who came along the time.

Selection Criteria

R1 says there has not been a selection process or criteria. The interviewee asserts that since the need is sudden and huge, the actors *"materialized organically".* This means that the actors available to help meet on the ground zero meeting point and they start working together. At the beginning it is not possible to have a whole idea about all the actors who are collaborating. Nonetheless, some of them knew each other by previous relations.

Institutionalization

When asked about the existence of formalized agreements, R1 speaks about the existence of some coordinators who emerged by the time. Many times, the interviewee asserts that at the beginning there was not a clear plan. So, from these answers it seems that at the beginning it did not exist any kind of agreement among the parties, and that probably the agreements are drafted neither after.

Activities

Activities

In the Dorian case the activities performed are the typical of immediate response: for example the provision of basic needs, the evacuation of people, access of potable water, health and medical aid and the reconstruction of infrastructure or places for the victims of the hurricane.

In particular, from the interview some of the actors involved are responsible and specialized in some activities and seems that the activities are "*breaking it down into sectors based on what the NGO was able to deliver in terms of service support*".

PS_{F1}: they are the one who connect other actors to local partners. They "*did the interpretation for them in other words, and so we provided the local flavor in terms of knowledge, how to get there, what to do, what's the culture there, so that people would know so that these NGOs would know how best to implement and execute their support*." They organize and coordinate, but it seems also that they are responsible for raising the needs, at least at the beginning.

NGOs: in general, they are the ones who implement and execute humanitarian aid.
NGO_{F1}: they are providing basic humanitarian needs. From other primary sources they distribute emergency kits, solar lanterns, clean water and to do so they purchase supplies locally (when they are available). In addition, from the interview PS_{F1} tries to connect this NGO with the local emergency services: "*what we* [PS_{F1}] *did, we connected them to the medical professionals in the private sector and then public sector and said look, your medical, you talked to our medical people, you go do your work.*" This importance of talking with local groups to understand what is happing and raise the real needs, is confirmed from other primary sources.
NGO_{F2}: they provide and cooked meals after the storm passes. Also, in this case PS_{F1} connects them with "*local people on the ground in Grand Bahama*".

Military: from other primary sources, it seems that the different militaries starts the rebuilding of infrastructure (like the bridge between *Coopers Town* and *Fox Town, Abaco*) together with private companies. A second activity is related to the production of portable water in *Marsh Harbour* and affected communities.

SOP:

It seems that there are present some standard procedures even if is not clear the "*formalization*" of them.
One is related to the documentation of people evacuated and the resources available in a sort of center (maybe the airport but it is not clear). Indeed, during the interview, the volunteers "*brought people back to a center where they had to be documented, listed. Everything about them was documented there, So we knew who we had.*"
Secondly there is the idea of a pre-position supplies in bunkers of main islands. In this way time is not wasted in transporting supplies after the disaster. However, it is not clear from the interview if there was this type of procedures before the Dorian hurricane.

Resources Sharing

R1 reports that in Hurricane's case the different partners are sharing a lot of things, for example: clothes (as they have a common clothing center), feedings, equipment as trucks, boats or barges, helicopters by the militaries and also radios. In addition, with the private sector "*they put up a lot of resources, a lot of money, a lot of hours, a lot of equipment*". An interesting challenge linked to the usage of this resources was "*how do we take those same private sector resources that were on the front line?*" The allocation and pre-position of them for the next disasters emerge during the hurricane as a question that need to be solved.

Also the knowledge has been in some way shared: for example the PS_{F1} is the one who "*provide the local flavor in terms of knowledge, how to get there, what to do, what's the culture there so that [...] these NGOs would know, how best to implement and execute their support*".

Information Sharing

Regarding this aspect, it is not really clear which type of information is shared. There are few data quoted by R1 that are shared with other partners: with NGO_{F1} the PS_{F1} seems sharing the local knowledge "*how to get there, what to do, what's the culture there*". Also, with NGO_{F2} the private representative gives "*the numbers of people that we have in our camps, here, the people in need food*".

A second aspect is that the central coordinator of response (NEMA) "*made decisions based on the information we were providing*". This demonstrates that there are a sort of information sharing caused by the other coordination mechanisms that are present: the *communication groups*.

However, R1 also reports that one of the main challenges is communication and information sharing "*Because, you know, again, it's a typical response with […] governments. They come in and they take charge and they don't want they don't like talking*."

Coordination mechanisms and Decision making

Coordination mechanisms

Many times, it is mentioned that the emergency has been sudden and huge, so there is not a plan to implement.

Instead, along the time some coordinators emerge aligning the NGOs features (focus areas, resources) and the needs of the population. In particular, these coordinators provide the NGOs with all the necessary information to work in a specific area and about where their help was necessary.
Later on, The NGOs are sorted in working groups according to their area of work and they probably coordinate their efforts within these groups. It is possible to assume this because during the meeting just one per group speak about their work.

In addition, what emerges later on, is the presence of NEMA as what can be defined as a central coordinator: it is responsible of decision making and it is the one who guides the meetings.

Decision-making

After three or four weeks, when the NGOs are on the ground, it is clearer also the decision-making: NEMA, the National Emergency Management Agency, takes charge of the decision making. The decisions are based on the information provided by the main actors during daily briefings which are led by NEMA itself.

Meetings

The main players and agencies (emergency management agencies, law enforcement, private sector), led by NEMA, meet daily each morning. By the time, the NGOs are segmented according to their area of work and at the meetings just one person per team is speaking, that means that the organizations are coordinating their efforts within the group.

From other primary sources the presence of meeting as coordination mechanisms is confirmed: for example, NGO_{F1} meets with "*emergency managers and other responding organizations to co-ordinate our response efforts and mobilize supplies".* Also, on the military side they usually meet: "*Military Lead Coordinators convene at Coral Harbor Base to discuss best use of air, land and sea assets to assist with disaster relief efforts in Grand Bahama and Abaco"*.

Communication tools

To what concern the communication tools, R1 states that there is not a common communication mechanism because the relief to the hurricane involves too many people.

Nonetheless R1 refers to the existence of WhatsApp chat groups and to daily briefing records sent by email. The interviewee also points out the existence of communication groups for the working teams that *really helped*.

Relationship Dynamics

The dynamics in terms of sharing of costs and benefits between the partners is clear: the costs are responsibility of each actor, the private sector "*put up a lot of resources, a lot of money, a lot of hours, a lot of equipment to make sure that the initial response [..].*" Similarly, the international contributions are independent and paid by them. No information about the rewards have been provided.

Finally, another aspect linked is the fact that NEMA is the one who makes certain decisions and who "*took charge of that and made decisions based on the information we were providing"*. It is not clear which is the barging power of each actors on these final decisions; consequently, it is not clear if it is a balanced or unbalanced relation.

Enablers

The Dorian response is characterized by many factors that enhance the collaboration in this context. Some of them can be generalized and some other seems very context specific.

- *Smart people*: Even without a real preparation for the disaster (no plans available, no knowledge of NGOs and sector rules) R1 reports as enabler the presence of good people who

could "*understood process, who understood that, look, we've not done this before, so let's take our time and but let's organize ourselves properly. And so it was […] literally smart people doing good things to get a good result*."

- Communication groups: as said the presence of these groups inside the working groups "*really helped*".
- Community sense-trust: it is an important factor because in this case "*it's not it's not as if you're dealing with a stranger. You're dealing with either your family member or your friends' family*." And this strong community background brings to even a higher willingness to help.
- Fast learning curve: the "*learning curve has been impressive*" and this permits that a lot of outcomes and knowledge are reached soon.
- Desire to help: R1 reports as first enabler the real *desire to help*. Everybody is in the same situation, with the same desire to live and to help the other.

Challenges

Even in this case the Dorian case permits to identify some main challenges. The first six emerge from the interview while the other are retrieved from other primary and secondary sources.

- Communication: the interviewee reports as a biggest challenge communication and information sharing. It is interesting the R1's opinion: the government involvement, who takes the responsibilities and does not like to talk, causes this barrier.
- Inexperience of NGOs' ways of working: PS_{F1} is not used to work with NGOs and their low working knowledge of NGOs provided a barrier, because "*as you well know, when NGOs come in, and they hit the ground, they want to just get things done*".
- Government restrictions: it seems that government, who arrives later on the scene but takes the leading role, become a barrier for NGOs. Indeed, "*the NGOs were ready to go. And government was saying, wait a minute, and sometimes in the in the mind of the NGOs, the wait was too long. So frustration began to build up"*.
- Frustration: three main reasons cause a high level of frustration. Firstly, Bahamas is a "*small country where everybody knows everybody. Many of us had families involved in either two islands. So the tension level is already high anxiety was high*". Secondly the magnitude of response was impressive, everything was destroyed. Finally, there was not any ready plan "*to do certain things*".
- Competition between NGOs: it has been discovered by R1 that "*NGOs don't necessarily like to work together*". It is strong the idea that each NGOs says "*that's my turf. So get out of my turf*".
- Logistic: it is a challenge confirmed also by secondary sources. The logistic challenges can be explained by two different motivations: firstly, the fact that "*we did not have a logistical plan*". Secondly the Bahamas geographical shape complicates the things. "*We're small islands, and it takes a while to get there, right. So logistics proved to be challenging*".
- Destroyed infrastructures: the Dorian hurricane has a high magnitude with many damages. Especially the people vehicles are destroyed "*making it difficult for them to come to central locations to receive supplies, and trucks or other vehicles to take goods to communities are*

also in short supply". Similarly, communication system are downed challenging even more the communication and collaboration.
- Risk of overlapping: as many groups and organizations are on the ground "*have to be sure we're not overlapping efforts*". This can become a key challenge.

Outcomes

Qualitative

R1 asserts that the main outcome of the collaboration is: *"[*it*] help us* [PSF1 and government] *to understand what we didn't know".*

Firstly, they discover that preparedness is a key for the success in the relief operations. This new awareness produces a new template to codify *"how to better prepare, how to communicate, how to pre-plan"* in responding to any disaster. They are building a very practical and solid plan for responding to any disaster. In order to understand which is the most effective way to respond, what is really necessary in preparedness, an interesting collaboration is initiated: an international cooperation with other best-countries (like Fiji, Philippines, Australia...) "*to help us structure the framework because they were considered to be benchmarks in terms of how they structured their private sector response*".

Secondly another important new knowledge is about the way NGOs generally function in emergency. The first lesson learnt is on how to better coordinate local and international NGOs "*for a more effective response after disaster*". Then, a second outcomes is a focus with the government on the approval and policy side: they are looking at possible legislative changes. "*So that when an emergency is declared, you have what we call a relaxing of normal rules, so that those NGOs and the disaster management agencies can actually function without all of the typical government red tape*."

In addition, the huge involvement of the private sector permits a sort of qualitative outcomes: the assessment of private sector's strength. The respondent reports that Dorian was "*an opportunity to assess just the strength of our private sector and the availability of resources and how best to manage those resources in quiet time."* In particular, the preparedness and recovery projects that have emerged after the response are a sort of "*outcomes*". For example, the "*Dorian provided us a great opportunity to understand what the business gap was*" and this has been addressed with the SME project that will later report in the paragraph Further Development.

Quantitative

The respondent says that it is not possible to provide precise information about the values of the outcomes (for example the number of beneficiaries) for government restrictions. Nonetheless, R1 mentions approximately the costs of the relief: the private sector spent round $9 million in the first four months and, overall, $20 million in service equipment; while, considering the contribution of the international actors, the costs reach around $100 million. The respondent reports also the outcome of the contribution of NGO_{F2} to the disaster relief: It is able to serve 12,000 meals per day.

Performance measurement

At the beginning, in Dorian response, there is not any kind of measurement system because they do not know what to expect, who is working on the ground and what they are doing. In this first phase, the actors report each other and trust in their words. Now it is clearer which are the needs, what they can do, how to measure their impact and so they are developing a KPI's and metrics system to measure their performances.

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Further Development

After the response of Dorian, Bahamas is entering in a more recovery stage. As a results two main projects are highlighted by the respondent:

1) SME (Small and Medium Enterprise) capacity building
2) Restore Housing

Few information is available for these two projects because they are recently started. For this reason, they are not considered as case studies in the analysis, but some relevant information is reported to understand the positive effects resulted after the collaboration in the response phase.

Regarding the **SME project** it aims to identify the more local damaged business which are at the same time relevant for the community and try to help them in restoring.

Actors: The actors involved are

- Non-profit organisation$_{F1}$ = an American non-profit which is involved in improving the lives of people across the United States and around the world.
- Non-profit organisation$_{F2}$ = an Haitian organisation with life-saving programs around building healthier and safer neighborhoods to mitigate the scale of devastation caused by disaster.
- NGO$_{F1}$ = here it provides the basic soft skill training to the SMEs
- Local entities: Small Business Development Center (SPDC), which is a project that the University of the Bahamas, the PS$_{F1}$ and the government started about two years ago with the same focus of the SME project. Secondly the local Red Cross, who is also "*expanding its humanitarian effort to include building capacity in the SME community as well"*.
- PS$_{F1}$ = who has a role of training and interacting with the SMEs

Motivations: The reason to start the project is linked to an outcome of Dorian"*the opportunity to discover what the business gap was*". The SMEs have big gaps between the functional business knowledge and what they are actually doing in their business.

Activities: The NGO$_{F1}$ and PS$_{F1}$ are doing a "*business one on one*" that is a new business training from day one. The objective is to introduce some business fundamentals like a real business plan and a training on procurement and inventory management.

Time span: the project is recently initiated and has a planned duration of at least one year and half.

The **Restore Housing** is a project that aims at providing basic housing (good fortified shelter) with all the basic utilities in order to move back the families together. As a first outcome 150 houses are going to be erected by April.

Actors: the actors involved here are for the majority the same of the previous project, but the main actors are:

- the government (especially the government's Ministry of disaster preparedness)
- the private sector (including PS_{F1} who has probably a coordination role of this sector)
- there are involved also climatologists' engineers, who are "*going to be looking at the area itself to make the determination should we rebuild back at this location*"

Time span: the project has an expected duration of one year and half or two years. The duration is influenced by the location itself: the main damaged area is on Abaco island and especially in Marsh harbour. This area is very critical, it is "*a marsh land*" and attention for rebuilding it's necessary. This is the reason of the involvement of climatologists' engineers.

Collaboration relations map

In this case the collaboration map is not available because no clear relations are identified in the projects. Maybe also for the structure, it is an immediate response project and the involvement of the actors is evolved organically across the Dorian response.

5.2.7 CASE G: Yemen medical distribution to IDPs

Respondents and company profile:

R1: the respondent is the global supply chain coordinator of NGO_{G1}, he is responsible of the supply chain and procurement of 18 countries. The interviewee has always worked in the supply chain field both in the private sector and in NGOs.

NGO_{G1}: Since 1992 it is a humanitarian organization on the front-line of emergencies, bringing assistance to victims of armed conflicts, natural disasters and extreme exclusion with particular attention to the protection of the most vulnerable people providing first aid, food, shelter, medical assistance and basic goods.

Projects profile

NGO_{G1} is active in Yemen since 2008. In 2015 the conflict outbroke, from that moment they start distributing humanitarian aid to thousands of displaced persons and refugees, providing medical and food assistance, guaranteeing support to schools, providing psychological care and economic support for families at risk.

Name	Location	Disaster Phase	Time span	Aim
Yemen medical distribution to IDPs (Internally Displaced People)	South and north of Yemen	Response	April 2019 - ongoing	They compensate the health care system of the nation. They provide medical equipment and drugs to different areas of Yemen to assist displaced Yemenis and Somali refugees, and to respond, in particular, to the worrying proliferation of infectious diseases and malnutrition, linked to the persistent conflict that has reached the fourth year of fighting.

Table 5.13: Project G profile

Findings contents

Actors

Actors and roles

NGO_{G1}: description above

ECHO (European Civil Protection and Humanitarian Aid Operations): European agency which provides assistance to suffering people.
Role: It is the main donor.

No-profit organization$_{G1}$: it is an independent Dutch social enterprise providing medicine and medical goods to healthcare organisations worldwide, at the best price possible. In practice it is a humanitarian procurement center. They are used to collaborate with international and local NGOs,

large funding organisations, ministries of health and central medical stores, and smaller mission hospitals.
Role: it sources the drugs and the medical equipment, it organizes the transport into the country.

Pharmaceutical manufacturers: Role: They provide the necessary drugs and medical equipment.

Shipping companies (usually PS_{G1}): PS_{G1} is a global business engaged in the shipping and logistics sector in 155 countries to facilitates international trade between the world's major economies, and among emerging markets across all continents.
Role: It insures transportation.

Third- part LSPs: Role: They guarantee the first transportation of the items within the King Abdullah port.

Customs agent: Role: It is a local company which guarantees the process of customs clearance.

Ministry of Health and pharmaceutical board: Role: they give the necessary permissions to import drugs in the country.

Primary health centers: They are part of the National Health System so they are managed by the Ministry of Health.
Role: they distribute locally the drugs and medical supplies.

Motivations

The respondent reports the motivations of two main partners (NGO_{G1} and ECHO): their motivations to collaborate each other are strictly connected to the aim of the project rather than the collaboration itself.

NGO_{G1}: it takes part in the project for responding to the humanitarian needs due to the war in Yemen, in particular, this project aims to strengthen the Health care system. In addition, they were in the country even before the conflict, so probably they are suitable and prepared to respond to these needs.

The donor (ECHO): it provides money in Yemen instead of other countries based on its political agenda. It tends to fund a humanitarian project if they have political and economic interests in the area. Obviously, all the humanitarian operations are influenced by this decision because they could be achieved just if there are available funds.

Selection Criteria

The respondent reports that NGO_{G1} has a written procedure to conduct procurement. Part of this procedure is related to the selection of the suppliers: NGO_{G1} undertakes a market analysis to evaluate the potential suppliers and their products and to decide who will take part in the project.

This analysis is based on some main criteria. NGO_{G1} tries to evaluate which partner ensures a higher speed of response, availability of products and cost effectiveness However, the last decision about the choice of the supplier is responsibility of the NGO_{G1}'s project manager. This is because

the choice could be influenced also by sudden changes in the countries (e.g. loss of access to health centers, etc).

Moreover, the respondent says that collaborate with some partners is an obvious choice; it is the case of the Ministry of Health*: "you have to collaborate with the Ministry of Health. There is no other way. So yeah, I mean […] it's a partner that is imposed to you, you cannot go around it."*

Institutionalization

When NGO_{G1} takes part in a project, it signs an agreement with the donor. The agreement establishes that the donor engages NGO_{G1} to serve a specific number of beneficiaries, in a specific area, within a specific project, during a precise period of time. At the end of the period the contract could be renewed or not. The agreement is standardized and could be of two types:

PPA (project partnership agreements): they are more strict agreements which bound the way of operating of the NGOs. It usually *"involves more reporting and involves more accountability towards the donors".*

Service contracts: they are less strict and leave to the NGOs more discretion about how to act. As the respondent says it is *"like they are completely externalizing the project that has to be implemented, there is a certain […] KPIs that we have to achieve and at the end of that project there is there is a transfer of funds to support the project and that's it".*

In the Yemen case, NGO_{G1} has signed a PPA agreement to take part in a medical project for one year but it will probably be renewed because the crisis is protracted. The agreement establishes many aspects of the collaboration: KPIs, process, SOPs and specific requirements.

Regarding the level of institutionalization with other partners no other information is available.

Activities

In this section it is described which are the main activities performed in the collaboration and the corresponding responsible.
The respondent mentions many times a clear NGO_{G1}'s process to initiate the supply chain of the project and to define the responsibilities within the organization. The main steps are:

- Need assessment in the country to identify where are the gaps and where humanitarian organizations could respond
- Write and present a proposal to the donor
- The donor approves the project and signs an agreement
- The project manager, who is responsible for the implementation of the project, establishes the amount of resources necessary in a certain location at a specific time
- The HQ logistics department is responsible to source and select the suppliers at an international or national level. The project manager and the technical adviser are in charge to take the final decision about the selection of the suppliers.

In the Yemen case, NGO_{G1} selects no-profit organization$_{G1}$ to be responsible of the sourcing of drugs and medical equipment and to organize transportation into the country. Then NGO_{G1} itself is in charge of distribution to primary health centers for the necessary drugs and medical equipment. Finally, the health centers provide health services and drugs to the beneficiaries.
The respondent mentions some other activities performed by NGO_{G1} within this context such as training to the healthcare staff, employing some personnel in the healthcare center and rehabilitating the primary health center.
To what concerns the permissions, the Ministry of Health authorizes to import the drugs in the country and set the regulations, while a customs agent guarantees the process of customs clearance.

SOP

The respondent mentions the use of some SOPs shared with the partners for procurement: the supplies should be compliant with the donors' regulations (ECHO regulations, UN regulations and USA regulations) and all the partners' actions should be compliant to these regulations.

Resources Sharing

The respondent identifies knowledge as the only resource shared with the partners: *"I mean knowledge you share with all of the partners, for sure, knowledge on the context of the country on how to move goods into a specific geography".*

The respondent observes that before the war the economy in Yemen was working well so it is still possible for the humanitarian organizations to rent warehouses or transportation capacity from local commercial companies. As a result, they do not need to share these resources.

In addition, from the interview it emerges that NGO_{G1} allocates part of its own resources to the project: for example, staff in the healthcare centers or distribution centers that can be used to provide healthcare services to the beneficiaries.

Information Sharing

Retrieve accurate and updated information is identified as one of the main challenges of the project. In this project supply chain partners share information about the status of the shipment such as *"if it's the order is still in preparation or if the order is placed if, what is the location of the shipment right now, if the container is at Port, if it's already in the vessel".* Probably it is hard to obtain this type of data in an accurate way.

However, R1 reports that information is not shared among all the partners of the SC but "*between all the relevant partners, to a specific function of the SC*".

Coordination mechanisms and Decision making

Coordination mechanisms and communication tools

From the respondent perspective it does not emerge any significant coordination mechanism in this collaboration. Nonetheless, the respondent mentions some coordination tools in the collaboration:

- There is a very clear process which describes in detail the order and the responsibilities of the single links of the supply chain (Activities); however, there is not a coordinator who coordinates overall the process.
- The respondent mentions the existence of a sort of steering group at country level, but the respondent cannot provide additional information because the medical stuff is more involved in it.
- There are no formal meetings, but the partners manage to align by informal calls.
- The humanitarian organization should report their actions and results to the donor.

Decision-making

The local government can be considered the responsible of decision-making in the collaboration. It plays a fundamental role in the decision- making as the respondent says: *"they can decide if you can implement a project or not, they can decide what how the product has to be designed. So, they can decide to exclude or include an international NGO into the country. So, I mean, we are very bound to the decisions that they want to* […] *make."* In addition, they authorize the import of the supplies in the country.

Relationship Dynamics

The respondent considers the collaboration unbalanced because the local government decides if "*implement a project or not, they can decide what how the product has to be designed. So, they can decide to exclude or include an international NGO into the country*." So, they have the majority of the power while NGO_{G1} is "*very bound to the decisions that they want to make."*

Enablers

As will be specified below (Outcomes), trust could be considered an enabler of the collaboration, however the respondent considers it more an outcome of the collaboration itself.

Challenges

The respondent identifies some challenges for the collaboration:

- Visibility along the supply chain: it is challenging the management of information and having accurate and updated information. This is due to the obsolesce of the systems used by the humanitarians; they don't have shared ERPs or VSM (Vendor systems machines). The respondent says: *"humanitarian sector is like let's say 30 years behind the profit sector in terms of information management".*
- Donors regulations: The supply chain is very constricted by the donors' regulations which *"imposes a bit what is their vision of our supplies seem to be structured in what mechanisms should be put in place to ensure complete transparency and accountability towards them*".
  In addition, the donor gives the fundings diluted along time and this can create liquidity issues to the humanitarian actors.

Outcomes

The respondent recognizes the necessity to create a relation with the partners and as a consequence two main qualitative outcomes:

- Reciprocal adjustment of the operations: the partners tend to adapt their operations and ways of working when they collaborate. The respondent describes the positive results of this: *"if you are dealing more and more in my side with a specific supplier you kind of managed to adjust your operations to the operations of the supplier and vice versa, I mean, and together you can find more creative ways or more fast ways of moving goods into a certain onset of an emergency"*.
- Trust: If the partners know each other they trust each other, and this can ease the operations. For example, if there is trust the suppliers accept the orders from the humanitarian organizations even before the payment is completed. It is very important because often there is lack of liquidity because of donors' boundaries. With facilitating payments terms the response is quicker. The respondent says*: "outcomes on this can be increased common trust and collaboration between the partners to ease somehow in this* […] *case the payment terms so, we can respond faster. Okay, collaboration means* […] *more trust means that each partner will perceive the other one as a less risky solution".*

Performance measurement

When NGO_{G1} signs the contract with the donor they agree about the objectives of the project to be achieved (number of beneficiaries, place, the timeframe, etc) and about the KPIs used to measure these objectives. Then, during and after the implementation of the project the humanitarian organization should report to the donor its results measured according to the metrics established before.

Type

Vertical collaboration

The case study is an example of vertical collaboration.

Horizontal collaboration

The respondent describes the successful collaboration with the logistics clusters which enhances their logistics operations in Yemen. The logistics cluster is a collaboration system among NGOs led by WFP to collaborate in many different aspects of logistics in humanitarian relief operations. In Yemen this collaboration allows to gather updated information about movement of people, situation of ports, to lobbying with local institutions to ease the regulations for customs clearance.

Collaboration relations map

As explained in 5.2 Findings, from the data of the findings in the different dimensions a map (Figure 5.6) of the relations between the different partners is provided.

As explained in the lines where information is available the main aspect that regards this relation is highlighted: here for example the NGO_{G1} has a relation with the primary health centers because it distributes to them the medical drugs and equipment, or it is responsible for the drug manufacturers.

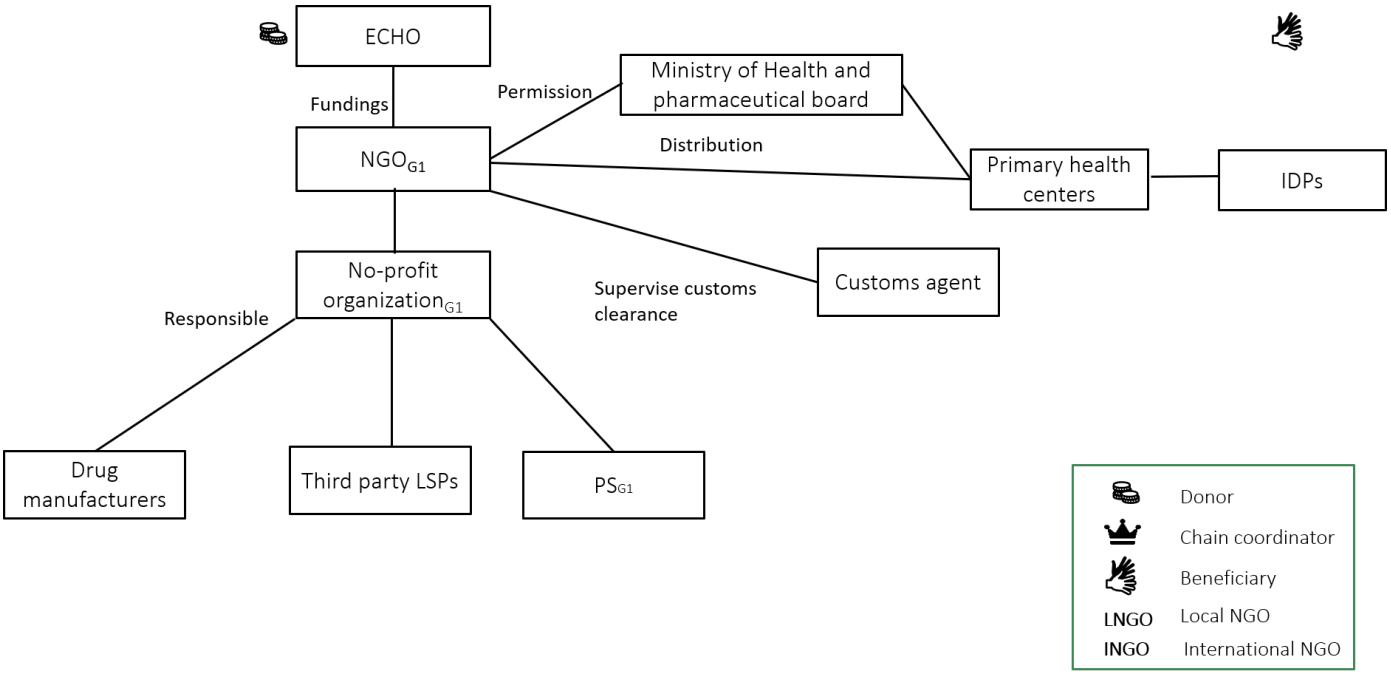

Figure 5.6: Collaboration relations map - Case F

6. Analysis and discussion

Using the data collected, two main types of analysis are performed: a within and cross-case analysis. As said in the methodology chapter (3.3 Research methodology), the unit of analysis is the collaboration project. Only the elements that belong to the cross-sector collaboration project are analysed while contextual elements that are relevant are only reported in the findings chapter (5.2 Findings). Here the terms project and case study are used as synonymous.

6.1 Within-case Analysis:

In the findings there are presented the elements of the collaboration of each case divided according to the dimensions, but at this point a criterion is needed to select the elements that answer to the second research question: *Which case-elements, among the cross-sector collaboration ones, can be considered collaboration critical factors (CCF)?*

Firstly, it is necessary to clarify what is a case-element and a CCF to answer the question.

A **case-element** refers to the specific configuration of a collaboration dimensions of the *findings framework* in the case. For example, the coordination mechanisms- decision making dimension is configured in the central coordinator presence.

A **CCF** (*collaboration critical factor)*, instead, is a specific case-element of the project which influences the configuration of the higher number of collaborative dimensions. Therefore, a CCF has a central role to determine the development of the collaboration project because it shapes the other dimensions.

To isolate and analyse the CCF elements, these steps are followed:

1. The first step is performed for each case-element of each dimension. It consists in identifying how many dimensions are influenced by the configuration of the analysed case-element (the influence could be a dependency or an interdependency). The case-elements that influence at least three dimensions are considered CCF, but more than one CCFs can be identified for each case.
2. The second step is performed just for each CCFs. It consists in identifying the causal logic of the relationship between the CCF and each dimension influenced: this logic is expressed answering to "*why*" or "*how*" the two factors influence each other or identifying a *specific mechanism* that can explain it.
3. Finally, for each CCF, a "*CCF map*" is built. A scheme of the structure for the map is present in Figure 6.1 : the main quadrant (orange) is the CCF, the bold name is the collaboration dimension while the italic is the case-element. Then the links are depicted as arrow with different directions: if it exits the relation is an influence relation, if it enters it is a dependence relation and if it is bidirectional it is an interdependency. Secondly, the influenced element is the blue quadrant: the bold name is the collaboration dimension while the italic is the case-element.

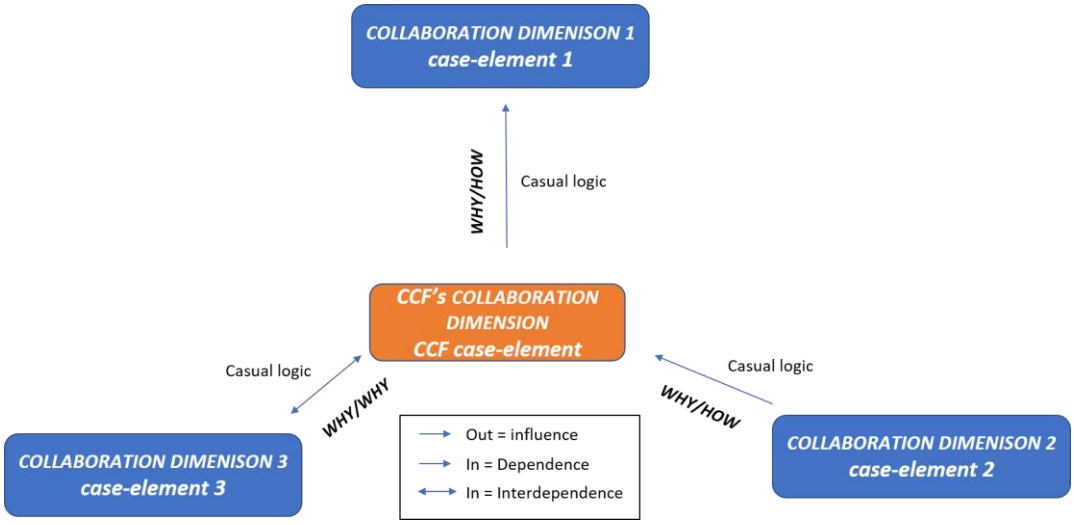

Figure 6.1: Structure of the CCF map

Before reporting the analysis two specifications are necessary:

- In the analysis the number of the dimensions analysed are restricted because the analysis of each case-element of 17 dimensions (the ones of the *findings framework*) for 7 cases is too much time consumption; the dimensions analysed are institutionalization, trust (enablers), actors, coordination mechanisms. This choice is led by the higher quantity and the quality of the information available in the findings about the cases to be analyzed.
- In the following section the most significant parts of the analysis are reported, the results of the first steps for the case-elements not critical (with a low number of influences on other collaboration dimensions) are not described.

6.1.1 Case A- Malaria treatment SC

In this case three main CCFs are identified.

1. A first key point is the **institutionalization** dimension**,** especially the **presence of an agreement** that define some or all the elements of the collaboration. Several times during the interviews R1, R2 and R3 mention the presence of agreements and in general the level of *institutionalization a*s elements which can explain different aspects of the collaboration. The CCF's map is the Figure 6.2.

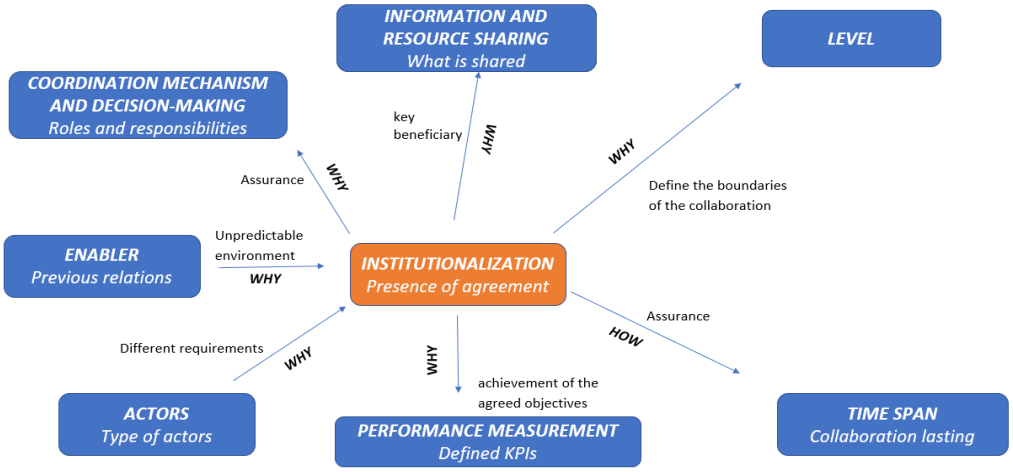

Figure 6.2: Presence of agreement map - Case A

Here it is identified each collaboration dimensions that is influenced – the underlined term- followed by the case-element and then the causal logic of the relationship- the bold term- between the CCF and each dimension influenced (*How* or *Why* or the *mechanism*) are explained. The same structure will be maintained for all the CCFs.

- <u>Level:</u> no specific configuration

Causal logic- The agreement defines the boundaries of the collaboration: It seems that the agreement itself determines the level of the collaboration; the respondent asserts: "*that* [agreement] *sets out the nature of the collaboration*". As hypothesis, the term "*nature*" reflects the level of the collaboration, that is because it seems quite explicit (even in other parts of the interview) that a more operational or strategical relation can be considered what the respondent called "*the nature*" of the collaboration. Indeed, the agreements specify the responsibilities within the collaboration, the common and individual duties and goals, the touch points and the activities of the partners. So, in the end, the presence of agreements defines the boundaries of each actor inside the collaboration that will be reflected in the nature of the relation (more strategic or operational).

- <u>Time span</u>: collaboration lasting

Causal logic- Assurance: The interviewee reports that the agreement influences the lasting of the collaboration because they define the willingness of the parties to collaborate along a certain period

of time. So, the time span is different in case the agreement is a one-year contract or when it is the way to set up decisions and willingness to collaborate for many years. In this sense, the agreements are an assurance of the desired duration: they give stability and certainty to the agreed lasting.

- Performance measurement: defined KPIs

Causal logic- A**chievement of the agreed objectives**: A third dimension that is influenced by the agreements is the measurement of performance because through the agreement the different parties try to establish "*What are you going to deliver, what is success criteria?*". So, it is important to have a well-defined performance measurement system if the relation is established by a written agreement because it is necessary to have clear and univocal metrics to measure the achievement of the established conditions and results.

- Actors: types of actors

Causal logic- Different requirements: A very common aspect, present also in the literature, is that "[agreements] *are incredibly different and depending on who we're working with"* [R1]. Indeed, considering the features and the requirements of each actor will be necessary to norm different aspects. For example, it is evident that if the collaboration is signed with an international actor the agreements, the outcomes and the deadlines tend to be more standardized than with the local actors. While considering the donors, they will ask to respect some precise conditions that are previously agreed. The level of formalization is influenced also by the donors' geographical level: if they are not locally present, they cannot control the daily work, so signing a document to arrange everything is agreed on seems the easiest way to not create conflicts.

- Information and resource sharing: what is shared

Causal logic- Assurance: The agreements in this case define which resources and information are shared among the partners. The agreements permit to have a stronger assurance on these conditions: the partners previously agreed on what they would like to share in terms of resources and information during the collaboration.

- Coordination mechanisms-decision making: roles and responsibilities

Causal logic- Assurance: The coordination mechanisms and decision making "*should almost always be written in the terms of reference*"[R3] and especially "*95, maybe 100 or 95% of all the work that we do, has a clear [...] work plan included and roles and responsibilities*"[R3]. The definition of these responsibilities is influenced by the formalization because it permits a higher security: if a delay or a challenge occurs the prior decision of the responsible can enhance the success of the collaboration.

- Enabler: Flexibility

Causal logic- Unpredictable environment: The agreements need to be flexible: "*there is a recognition that contracts should be able to be deliverables, needs to be reviewed, landscapes change, country priorities change […] they shouldn't be so rigid*". Indeed, the agreements establish

(a priori) many aspects of the relation trying to answer to the needs of the country. However, these needs can easily change along the time, both between the signature of the contract and the effective implementation or during the implementation itself. For this reason, the agreements in order to really enhance the collaboration could be revised, changed and adjusted even after the sign.

2. A second element that emerges is the presence of **previous relations** (enabler of collaboration dimension) between all the actors involved: all the three interviewees quote that relations before the collaboration project can enhance the cross-sector partnership. In the case A, NGO_{A1} and Non-profit $organization_{A1}$ had a previous relation, but probably, as Project A is the result of two previous projects with more or less the same aim and actors involved, all the actors have built a previous relation.
This CCF seems relevant because, as reported in the CCF map (Figure 6.3), relationships dynamics, partner selection criteria, and coordination and decision making are strongly influenced by it.

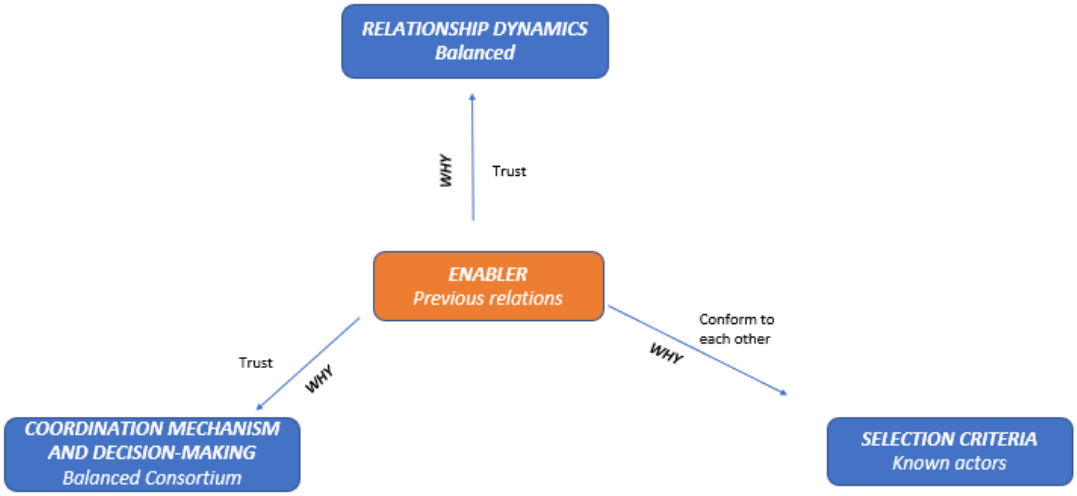

Figure 6.3:Previous relations map - Case A

- Relationship dynamics: balanced

Causal logic- Trust: In the project A the relationships dynamics among the local partners and international ones are different from the typical cases because there is an unexpected balance between them: the relation between NGOA1 and non-profit organisationA3 (a local partner) is emblematic of this: non-profit organisationA3 "*have more voice than the other partners. In fact, this is because this relationship has really grown over years as well and there has been very clear trust relationship that has been built there*" [R3]. So, it is possible to conclude that a more balance relation is possible when the partners know from previous relations because they trust each other.

- Selection criteria: known actors

Causal logic- Conform to each other: If the partners have collaborated before they know each other and they have learnt how to fit their way of works, their procedures, their values, with the

one of the partners. So, it is easier to collaborate with known partners because they have already faced this adaptability challenge. For this reason, NGOA1 prefers to collaborate with known partners. The non-profit organizationA3's respondent says "*the relationship that then develops out that out of that is what determines what happens as you as you further develop. So, with Transaid, we have something like eight years working together*".

- Coordination mechanism-decision making: Balanced consortium

Causal logic- Trust: The balanced relationships dynamics among the partners are reflected in the coordination structures implemented in project A. They are using a consortium in which the decision-making is balanced as the respondent R1 asserts: "i*t's quite shared decision making and people are quite free with each other […], just mutual respect for. We try to have one organization has one vote to on decisions*[…]". This is possible because, as the respondent R3 says: "*deliberate equity within the Consortium because thinking and trust has already been built*". The trust is, as before, explained by the presence of previous relations.

3.The last CCF of Case A is the presence of a specific **actor**: the **government**. Indeed, especially in the interview with non-profit organization$_{A1}$ the government presence appeared to be critical. The government in the case is the central coordinator itself: The National Malaria Elimination Center (NMEC) has the mandate of the Ministry of Health to implement the project to fight against malaria.
The elements influenced by the government are shown in the CCF map (Figure 6.4) and further described, they permit to define the elements as critical:

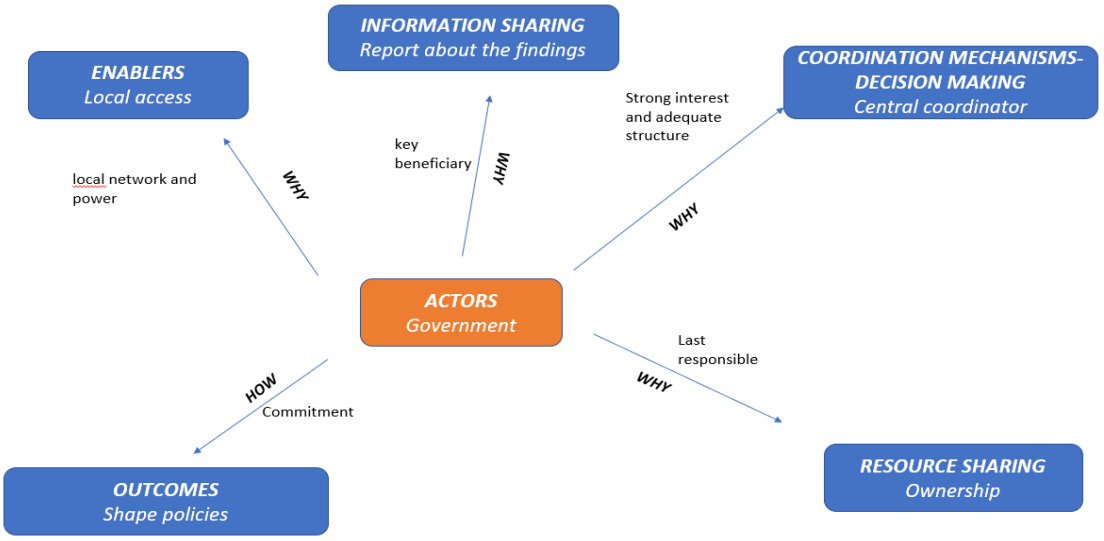

Figure 6.4: Presence of the Government map - Case A

- Information sharing: Report about the findings

Causal logic- Key beneficiary: the government receives some information from the partners: a final report on the situation and the results obtained. For example, non-profit organisationA3

reports "*Working with government partners, that is often a very important thing that we would rather produce the report and highlight the findings as they are, and without necessarily changing anything about the findings themselves, desirable or undesirable*." The reason of this reporting is the fact that they are in some way the key beneficiaries of this project: they are the first one who want and need to eliminate Malaria in Zambia. As a result, they must be updated on the project's progress.

- Coordination mechanisms-decision making: Central coordinator

Causal logic- strong interest and adequate structure: A governmental agency (the National Malaria Elimination Centre) is responsible for the coordination of the program as it is said: *"And most often, they are the ones who then provide the logistics around how to get that work done. In the case of Zambia, it would be the ministry of the Ministry of Health and in particular, the National malaria control program, who have a very clear interest to eliminate malaria"*[R3] . So it is clearly the key beneficiary: it has a strong interest in the project. The government can be also responsible of the project, and especially central coordinator, because an adequate structure pre-exists, and it could be charged of this role (the National Malaria Elimination Center is then linked with the Health district teams).

- Enablers: Local access

Causal logic- local network and power : The government presence permits to easily collaborate thanks to " *all the necessary support in accessing the communities, the health facilities and the stakeholders, including doctors and so forth who are working in the public health Delivery System*." This is possible because the government has a local network: it knows the local actors present in Zambia. In addition, it has also a local power that can exploit to facilitate the others' partner collaboration.

- Outcomes: shape the policies

Causal logic - commitment: The respondent R3 asserts that the collaboration could be considered successful if it influences the government policies: *"if you see something that you have been involved in being used in public policy or national policy, that's also an indication of the value of your work […]. So that also is a way of showing that we're being appreciated and that we're contributing."* This is possible just if the government appreciates the work done by the partners and if it is involved in the project's objectives and so it is ready to align his work with results of the project itself.

- Resource sharing: ownership

Causal logic- last responsible: The resources are shared during the collaboration: the partners share assets, vehicles, etc financed by the project money. The ownership is influenced by the government as, at the end of the collaboration, these resources are handed over by the government. This means that it is possible to consider the government as the ultimate owner of these resources.

Case A – CCF summary

Summary of the CASE A main CCFs: the case elements and the related collaboration dimensions are reported in the first two columns, the third column highlights the number of dimensions that are influenced or dependent from the CCF. The same structure will be maintained for all the case studies.

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Presence of agreement	Institutionalization	7
Previous relation	Enabler	3
Government	Actors	5

Table 6.1: CCFs summary - Case A

6.1.2 Case B- Emergency distribution SC:

In this case two main CCFs are identified.

1. Regarding the second case it seems that a key point of the case is the existence of a **strong central coordinator** (**coordination mechanism-decision making dimension**). In this case the coordinator is the Non-profit organization$_{B1}$.

The elements influenced by this specific type of coordination mechanism are shown in the CCF map Figure 6.5 and further described, they permit to define the elements as critical.

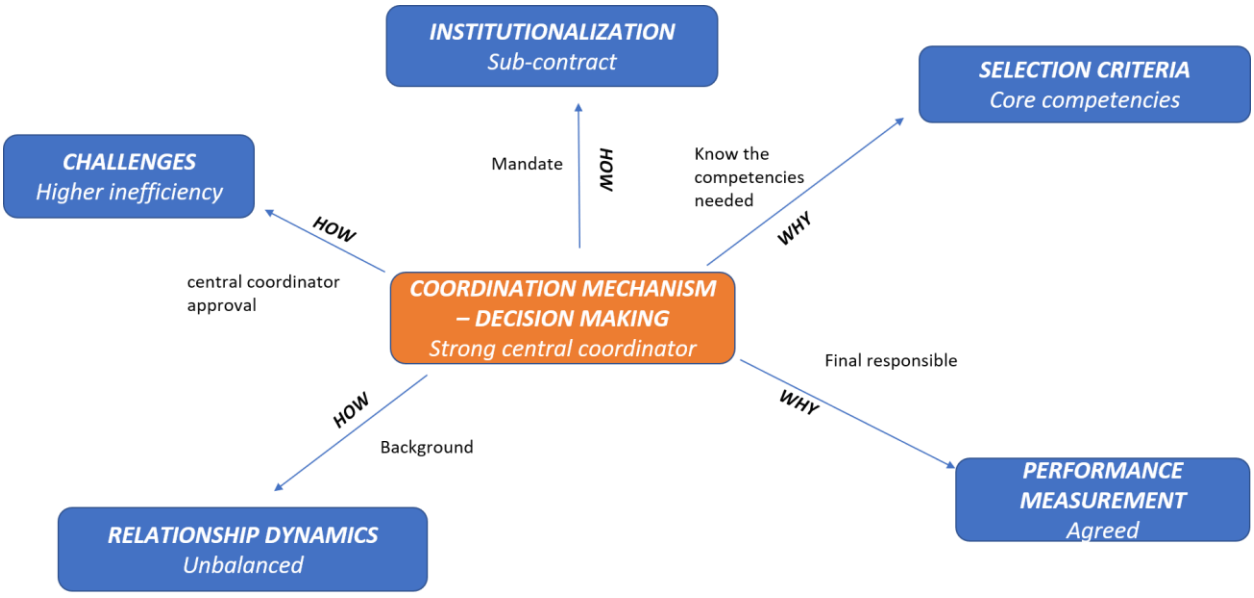

Figure 6.5: Central coordinator map - Case B

- Selection Criteria: core competencies

Causal logic-Knows the competencies needed in the project: The central coordinator has the responsibility to select other partners: the choice of the partners is based on their core

competencies. For example, NGO_{B1} is selected because of their good transport competencies. The central coordinator decides this criterion because he is the one who knows which competencies are needed in the project and start to collaborate with the one who can provide them.

- Institutionalization: Sub-contract

Causal logic- mandate: The central coordinator has an agreement with the donor and then he subcontracts the other actors on different aspects. The coordinator performs this process exploiting the mandate (not clear if from UN agent or the Madagascar government) received: it has the decision making of identifying and contract the other partner in the name of the mandate's owner.

- Performance Measurement: agreed KPIs

Causal logic- final responsible: The central coordinator is also the one who decided the KPIs. It is the final responsible of the project because it is in charge to accomplish the mission. Obviously, all the other partners that are subcontracted by him should evaluate and report their activities. During the interview R2 specifies that these KPIs and success criteria are well defined in the agreement itself.

- Relationship Dynamics: unbalanced

Causal logic- background: It is evident that the presence of a central coordinator can shape the relationship dynamics of the collaboration. In this case it seems clear that the central coordinator has a strong power and the dynamics are unbalanced. Indeed, the different partners cannot influence the decision or the objectives. For example, the R2 reports that the central coordinator is used to "*ask us* [NGO_{B1}] *for opinion but in the end they* [central coordinator] *are making the final decisions*"; NGO_{B1} cannot *steer* the situation. This strong power can be attributed by background features: it is part of a big project with big founds and international donor and actors. The number of partners is high and no previous relations with the local level are present. It seems that the only way to efficiently collaborate in this context is to have an unbalanced decision-making: the central coordinator maintains the power and overview of all the partners' activities without involving them in the decisions.

- Challenges: higher inefficiency

Causal logic- central coordinator approval: the project, as said, is a big project where the inefficiency can easily increase: "*on a big program thing were very slowly, a lot of layers to go through you know having a document reviewed for example can take two months*." The strong role of the central coordinator aggravates this issue: if all the partners' contributions need to be reviewed and approved by the central coordinator it is probable that the waiting time increases and consequently also the inefficiency.

2. The presence of the agreements is a CCF also in the case B. The dimensions influenced and the reasons why this case-element is critical are very similar to the ones of the same CCF

in case A. Indeed, the company interviewed is the same in the two cases so the modus operandi concerning the agreement is similar in the two cases. In particular, $NGO_{A/B1}$ considers the existence of the agreements fundamental to work in a humanitarian context.

The elements influenced by presence of the agreements are shown in the CCF map Figure 6.6 and further described, they permit to define the elements as critical.

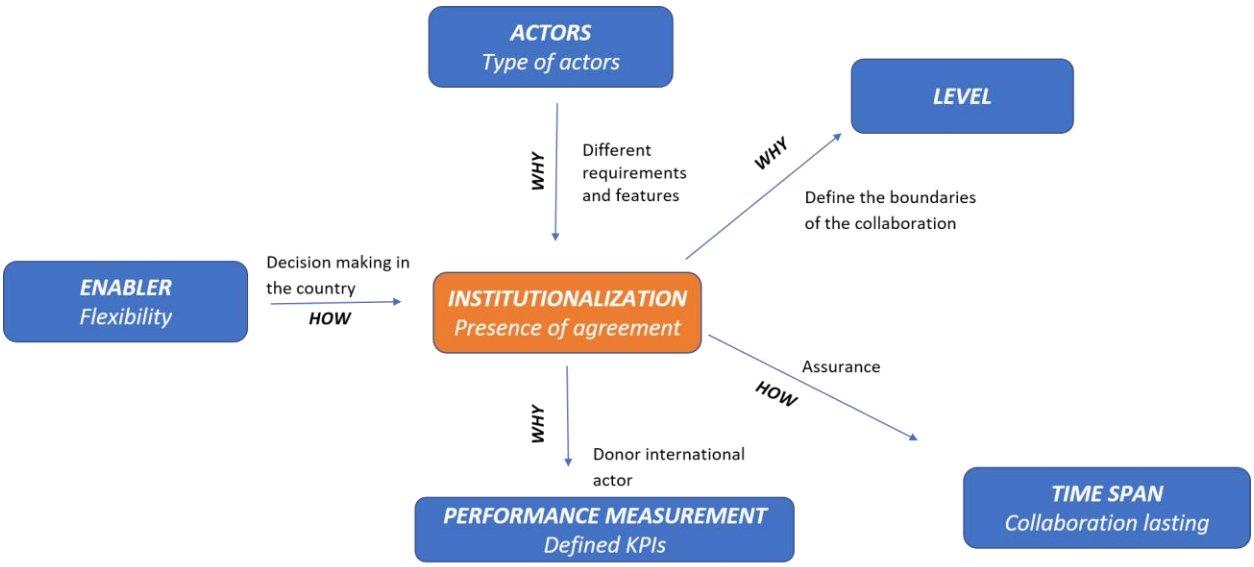

Figure 6.6: Presence of agreement map - Case B

- Level:

Causal logic- The agreement defines the boundaries of the collaboration: As it has been identified in the case A, it seems that the agreement itself determines the level of the collaboration; the respondent asserts: "*that* [agreement] *sets out the nature of the collaboration*". As hypothesis, the term "*nature*" reflects the level of the collaboration, that is because it seems quite explicit (even in other parts of the first interview) that a more operational or strategical relation can be considered what the respondent called "*the nature*" of the collaboration. Indeed, the agreements specify the responsibilities within the collaboration, the common and individual duties and goals, the touch points and the activities of the partners. So, in the end, the presence of agreements defines the boundaries of each actor inside the collaboration that will be reflected in the nature of the relation (more strategic or operational).

- Time span: collaboration lasting

Causal logic- Assurance: As it has been already explained in the case A, the interviewee reports that the agreement influences the lasting of the collaboration because they define the willingness of the parties to collaborate along a certain period of time. So, the time span is different in case the agreement is a one-year contract or when it is the way to set up decisions and willingness to collaborate for many years. In this sense, the agreements are an assurance of the desired duration: they give stability and certainty to the agreed lasting.

- Performance measurement: defined KPIs

Causal logic- Donor international actor: A third dimension that is influenced by the agreements is the measurement of performance because through the agreement the different parties try to establish "*What are you going to deliver, what is success criteria?*". The choice of these criteria depends on the actors involved in the collaboration. In particular, in the Madagascar project the agreement signed establishes precise metrics to measure the project outcome; the US organization$_{B1}$ imposes its own indicators "*that are measuring the success of the program on, and we [NGO$_{B1}$] will report in to those in a very specific way*."[R1] It is necessary that NGO$_{B1}$ reports its results in a precise way because it is dealing with big international organizations which operate in a standardize way to keep a precise control over their projects

- Actors: types of actors

Causal logic- Different requirements and features: Also in this case, this dimension is affected in case B for the same reasons it the case A is affected. Indeed the respondent assert that «[agreements] *are incredibly different and depending on who we're working with* [R1]». Indeed, considering the features and the requirements of each actor will be necessary to norm different aspects. In the case of Madagascar, it is possible to identified at least two different types of contract depending on the actor and on its role in the collaboration: Non-profit organization$_{B1}$ has a cooperative agreement with US organization$_{B1}$, and then NGO$_{B1}$ has been contracted as a subcontractor to Non-profit organization$_{B1}$.

- Enabler: Flexibility

Causal logic- Decision making in country: As recognized for the case A, the agreements need to be flexible: "*there is a recognition that contracts should be able to be deliverables, needs to be reviewed, landscapes change, country priorities change […] they shouldn't be so rigid*". Indeed, the contracts establish (a priori) many aspects of the relations trying to answer to the needs of the country. In case B it is possible to combine a strong control of the central coordinator Non-profit organization$_{B1}$ and flexibility of the agreements placing "*more decision making in country than a contract" [R1]*.

Case B – CCF summary

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Strong central coordinator	Coordination mechanisms – decision making	5
Presence of agreements	Institutionalization	5

Table 6.2: CCFs summary - Case B

6.1.3 Case C- Food rations SC

In this case one main CCF is identified.

1. A key point of the interview is the existence of **strong central coordinator** that in this case is the UN_{C1}. The elements influenced by this specific type of coordination mechanism are shown in the CCF map Figure 6.7 and further described, they permit to define the elements as critical.

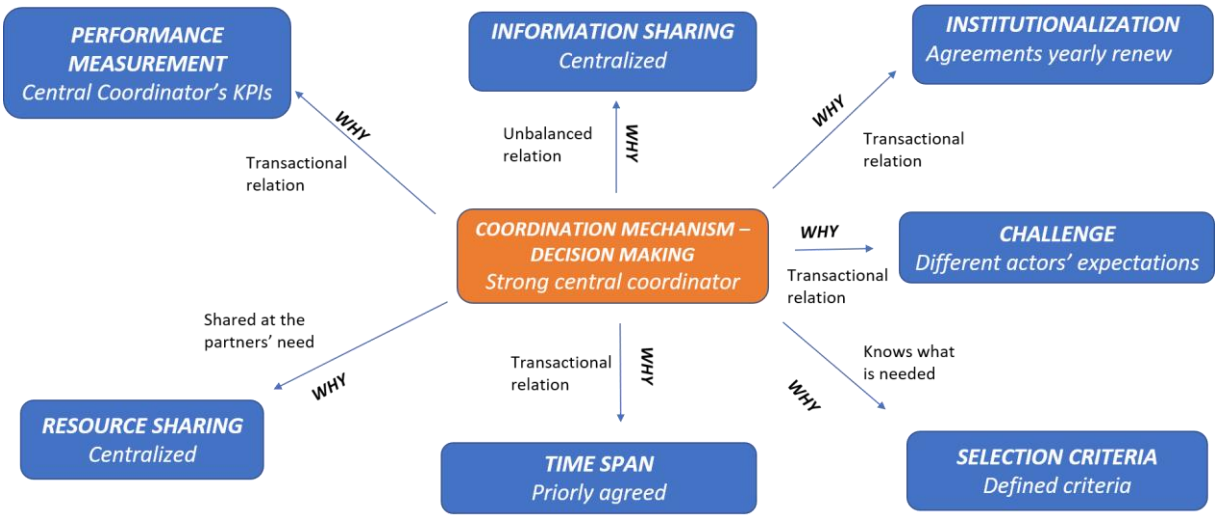

Figure 6.7: Central coordinator map - Case C

- Selection Criteria: Defined criteria

Causal logic- Central coordinator knows what it is needed: Also, in this case, as in case B, the coordinator is the one who selects the partners. Specifically, UN_{C1} decides and applies some specific criteria differentiated by actor. These criteria are defined by the central coordinator because it knows exactly which are the needs and it can evaluate who can better respond.

- Institutionalization: agreements yearly renew

Causal logic- Transactional relation: UN_{C1} is the one who contracted the other partners and at the end of the year it reviews each actor based on specific criteria to keep the collaboration or not. This can be explained by the type of relation between the two partners: it is just a transactional relation that does not look at the strategic outcomes but only at the operative ones. UN_{C1} needs this service and outsource it to the LSPs, if they do not provide the right service the central coordinator can just change to another provider.

- Information Sharing: centralized

Causal logic- Unbalanced relation: The partners are not developing the project on their own, but they are just coordinated by the central coordinator who coordinates and decides of the whole chain. The central coordinator has no reasons to share the information about the entire chain: the information sharing is centralized because the relation is unbalanced. Each partner indeed receives

some specific information from UN_{C1} and also "*in contrary, local partner and actors send […] information to return to* UN_{C1}*.",* through reports for example, but only on their part of the SC.

- Performance measurement: central coordinator's KPIs

Causal logic- Transactional relation: UN_{C1} measures the partner performance performing the annual review. The usage of these KPIs is decided and set by the central coordinator itself. This because the collaboration with the partners is not based on a strategic relation between the central coordinator and the partner but it is just transactional, so the central coordinator is looking for the partners who give the best service.

- Time span: priorly agreed

Causal logic- Transactional relation: UN_{C1} decides if renew or not the collaboration at the end of each year. For this reason, the central coordinator is the ultimate responsible for the duration of the collaboration. This because the collaboration with the partners is not based on a strategic relation between the central coordinator and the partner but it is just transactional, so the central coordinator can decide to collaborate with the partners just during the period of time necessary to receive their services.

- Resource sharing: centralized

Causal logic-Resources shared at the partners' need: The central coordinator owns the resources and it shares those with the other actors when they need them. Indeed, the UN_{C1} owns funds, assets, vehicles and obviously food rations. Probably it shares these resources with the local partners in a very operative way: UN_{C1} has the complete control on these resources (centralized model) and if the local actors need for example vehicles, it shares them.

- Challenge: different actors' expectations

Causal logic- Transactional relation: The partners do not have the same objectives but each of them has its own goal and policy expectations and this can create conflicts of interests. In particular, UN_{C1} wants to serve honestly the beneficiaries, however, commercial companies want to make profit and sometimes, as a consequence, they can "*submit bad service for high prices*". While LNGOs sometimes are not neutral and they try to attract "*lot and a lot of humanitarian aid assistance and humanitarian aid project assistance […]* [for their] *cousins and, and their friends*" or in general for some specific places. The reason of this is that the central coordinator does not involve the partners in the objectives of the project itself, but it involves them just to accomplish some tasks that are part of a bigger project they are not involved in: the relation is just transactional.

Case C – CCF summary

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Strong central coordinator	Coordination mechanisms – decision making	7

Table 6.3: CCFs summary - Case C

6.1.4 Case D- CBT SC

In this case two main CCFs are identified.

1. One CCF of this project is the presence of a specific **type of actors**: the food needs of well-specified beneficiaries (pregnant women and lactating women) is addressed thanks to an innovative business model based on the transfer of cash voucher. Nonetheless, this model is based on the involvement in the collaboration of a specific profile of actors like the contracted supermarkets (where the women can purchase using the cash vouchers) or the manufacturers of plastic vouchers. They are both representative of the **private sector**.

The elements influenced by this specific type actor are shown in the CCF map Figure 6.8 and further described, they permit to define the elements as critical.

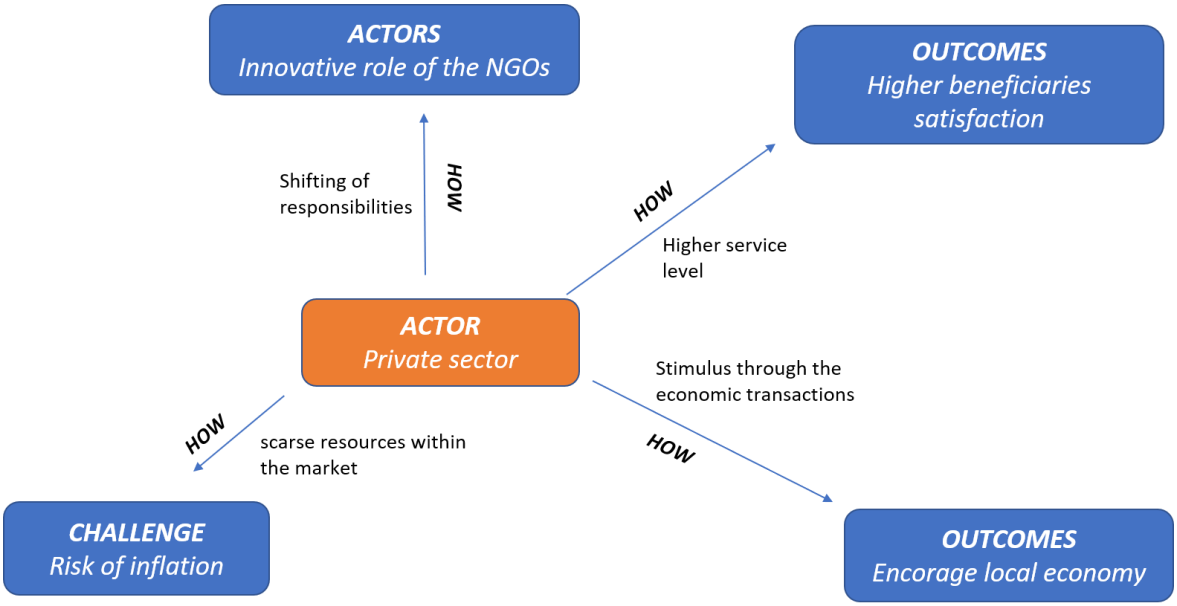

Figure 6.8: Private sector map - Case D

- Outcomes: Encourage local economy

Causal logic- Stimulus through the economic transaction: The involvement in the collaboration of the local supermarkets permits that, thanks to the cash based transfer (CBT) modality, they encourage the restart of the local economy because they create economic transactions throughout the market.

- Outcomes: Higher beneficiaries' satisfaction

Causal logic- Higher service level: The involvement of supermarkets ensures to the women a higher level of satisfaction: they have available, due to the presence of the supermarkets, different type of products and they can purchase in function of their needs. This possibility can be classified as a sort of higher service level: not just a standardized basket of food but the possibility to choose the items.

- Actors: Innovative role of the NGOs

Causal logic- Shifting of responsibilities: the NGOs have not the traditional role of distribution, for example the UN_{D1} does not have to supply and to warehouse food or neither to distribute it to the local NGOs for a further distribution. This is possible because the supply and distribution are in charge to the supermarkets themselves where the beneficiaries can directly purchase their food. The responsibilities have shifted from a higher level in the SC to a lower one.

- Challenges: inflation risk

Causal logic- Scarce resources in the market: the involvement of local supermarkets implies the necessity of an adequate amount of food supplies within the local market. However, these resources are scarce in the market and so there is the risk of inflation: a higher demand without an increment of supply offer can increase prices causing high inflation.

2. In the case D the central coordinator of the collaboration is the same of the case C. Therefore, many features are common among the two cases because the approach is similar in the two projects. For this reason, the presence of a **strong central coordinator** appears to be critical also in the case D, as shown in the CCF map (Figure 6.9),where the elements influenced are shown and further described.

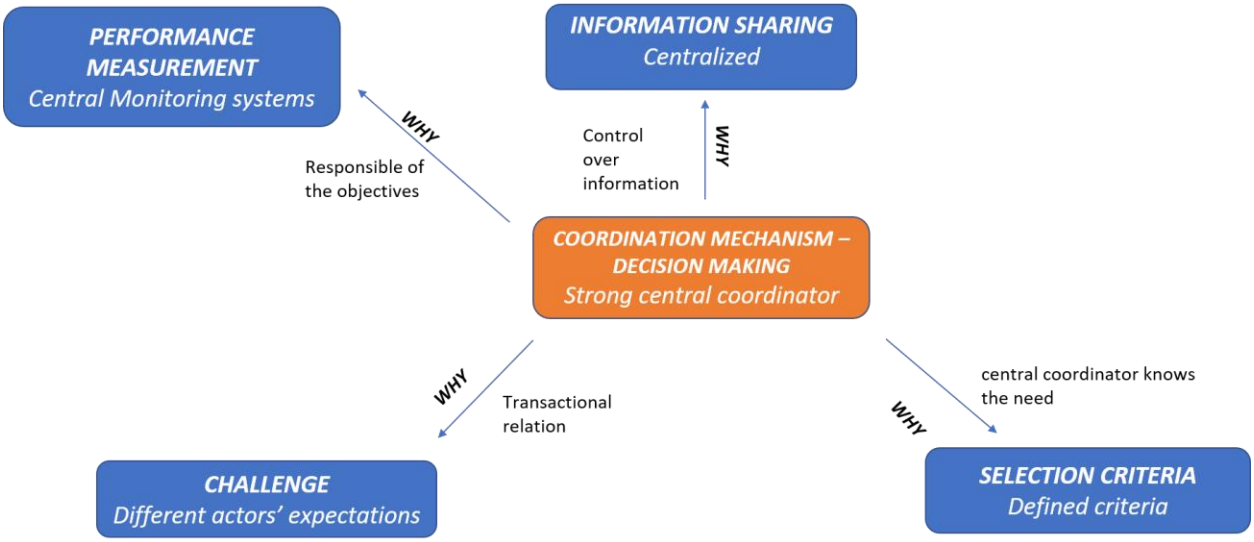

Figure 6.9: Central Coordinator map - Case D

- Selection Criteria: Defined criteria

Causal logic- Central coordinator knows the need: As for case C, the central coordinator selects the partners, UN $organization_{D1}$ is used to perform a cost-benefit analysis "*to select best actors in best area and take best proposals*". The central coordinator is the most suitable actor to perform this selection because it knows the needs of the project and so it is able to evaluate the best partner for the collaboration.

- Information Sharing: centralized

Causal logic- Control over information: The management of information in this case is centralized: "UN organization$_{D1}$ *send the information to local partner in contrary, local partner and actors send another information or another information to return to* UN organization$_{D1}$". This management of information is present because allows the central coordinator to keep the control over the data exchanged among the partners (that are also sensitive and personal information) and to collect them.

- Challenge: different actors' expectations

Causal logic- Transactional relation: The respondent highlights the same challenge for the project C and D. So, considering that the central coordinator manages in a similar way the two project, also in this project this challenge is partially caused by the presence of a central coordinator. In particular, partners do not have the same objectives but each of them has its own goal and policy expectations and this can create conflicts of interests. In particular, UN$_{C1}$ wants to serve honestly the beneficiaries, however, commercial companies want to make profit and sometimes, as a consequence, they can "*submit bad service for high prices*". While LNGOs sometimes are not neutral and they try to attract "*lot and a lot of humanitarian aid assistance and humanitarian aid project assistance […]* [for their] *cousins and, and their friends*" or in general for some specific places. The reason of this is that the central coordinator does not involve the partners in the objectives of the project itself, but it involves them just to accomplish some tasks that are part of a bigger project they are not involved in: the relation is just transactional.

- Performance measurement: central monitoring system

Causal logic- Responsible of the objectives: The central coordinator has the overall view of the project for this reason it could be responsible to coordinate and lead the other partners to reach the final objectives of the project. But to keep this general vision of the projects it needs to measure the results of the partners implementing its own performance measurement system. For this reason, UN organization$_{D1}$ is used to perform some on-site monitoring (OSM) checklists about the projects results.

Case D – CCF summary

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Private sector	Actors	4
Strong central coordinator	Coordination mechanism – Decision making	4

Table 6.4: CCFs summary - Case D

6.1.5 Case E- Survival kits pre-positioning

The case study *Survival kits pre-positioning* has three interesting critical elements.

1. First of all, it is characterized by an innovative collaborative business model which is based on the **pooling of resources** (**resource sharing** dimension).

The elements influenced by the pooling are shown in the CCF map (Figure 6.10) and further described, they permit to define the element as critical.

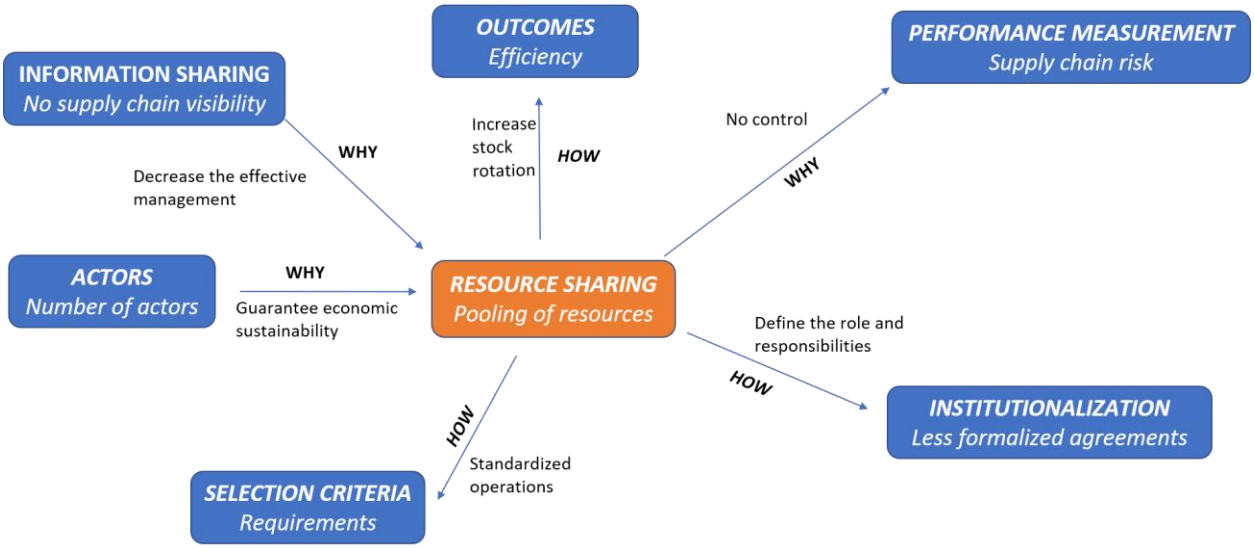

Figure 6.10:Pooling of resources map - Case E

- Actors: number of actors

Causal logic- Guarantee the economic sustainability: The pooling depends on the number of actors for an economic reason. Indeed, higher is the number of partners and lower should be the capital invested to pre-finance the stocks, in the pooling of resources. The lower pre-financing permits to have a lower risk. In addition, the presence of a higher number of actors permits to create a higher demand: the result is a higher stock rotation, that is the KPIs to measure the pooling (and collaboration) success. The actor dimension influences the pooling for this reason: a higher number guarantee a long-term economic sustainability. This mechanism is evident in the case: one of the reasons for the ending of the pooling was the low number of actors involved. Indeed, R1 lesson learnt is that it is needed "*more collaborators or more […] actors ready to participate in such projects where to achieve critical mass to be financially sustainable*".

- Outcomes: Efficiency

Causal logic- increase stock rotation: If the pooling is well performed it creates a high stock rotation which is the main indicator to measure the increase of the efficiency in delivery the kits. This high efficiency is the main collaborative outcome.

- Performance measurement: Supply chain risk

Causal logic- No full control of resources: Everyone that is involved in the pooling of resources can use the resources (they are write stocks) and so there is the possibility that who gets first access take them or there is no availability anymore. This is briefly translated in a higher supply chain risk: the reasons for this higher risk is the absence of full control by each partner on its "own" resources. Obviously, this is the negative side for the pooling of resources itself.

- Selection Criteria: requirements

Causal logic- Standardize the operations: To share the warehouse and the stocks the NGOs should have some requirements. In particular they should have standardized items shapes otherwise the stock in the warehouse is not efficient and they have to invest capital to finance the common resources

- Information sharing: No supply chain visibility

Causal logic- decrease the effective management: the absence of supply chain visibility affects the resources. Indeed, even if the resources are financially and operatively shared, the relative information are available only to the central coordinator. As a consequence, resources management is less effective because it is not shared (for example there are overlapping of forecasting, independent planning, no consensus about the access to the resources...).

- Institutionalization: Less formalized agreement

Causal logic- Define the roles and responsibilities: The pooling of resources is not formalized because it is not decided who are the owners of the resources, who can manage them, who is responsible for possible issues or mistakes. As a result, also the agreements result in a lower formalization.

2.The second critical element is the presence of the **private sector** represented by PS_{E1} and the suppliers/manufacturers. The specific elements are divided by the two representatives of the private sector: the first four elements are attributed to the PS_{E1} who is involved in the collaboration for CSR motivation. While the second two elements (*coordination mechanisms* and *institutionalization*) are attributed to the suppliers who are involved in the collaboration with a profit motivation. These two different motivations indeed create a completely different level of collaboration. However, in the CCF map (Figure 6.11) and in the definition of the CCF itself the sector and not the specific actor is highlighted as critical factor.

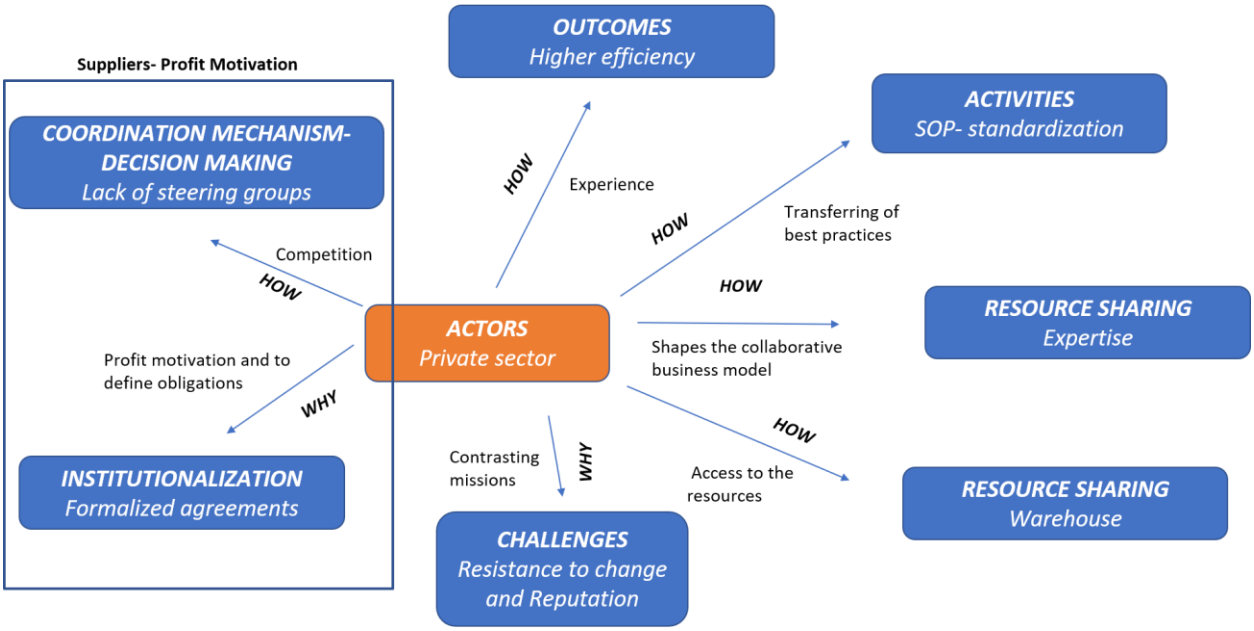

Figure 6.11: Private sector - Case E

Firstly, are investigated the elements influenced by **Private company = PS_{E1} (CSR motivation):**

- <u>Resources:</u> Expertise and warehouse

Expertise – **Causal logic- Private company's presence shapes the collaborative business model**: the private company is sharing its business expertise. Indeed, the new business model, that is protagonist of this collaboration, is typically used in the private sector and not in humanitarian context. The presence of this actor and its expertise is shared through the application of this model.

Warehouse – **Causal logic- Access to the resources-** PS_{E1} influences also another resource that is shared: the warehouse. The company indeed provides the access to this resource that without its presence was probably not available.

- <u>Activities:</u> SOP-standardization

Causal logic- Transferring of best-practice: The private sector tries to standardize the items within the survival kits. The respondent describes *"it was in the form of a cube, which was I think roughly kind of the dimensions […] a kind of a carry bag, but in the shape of a few, so, very logistically efficient to store and transport as well."* This common practice is not used in the humanitarian sector, so it has been transferred by the private sector which usually consider it as a best practice because it can increase the efficiency.

- <u>Outcomes</u>: Cost efficiency

Causal logic- Experience: Thanks to the involvement of the private sector it is possible in the case to obtain a cheaper access to warehouses services. In addition, the focus on cost efficiency can be considered a qualitative outcome. The attention for cost efficiency can be obtained only through the experience of the PS_{E1}: the humanitarian agencies have not experienced this concept

(particularly in the time of case E): "*I'm I am you know, 100% sure that the aid sector had attempted a similar warehouse operation it would have cost them five or six times more, just because, you know, the money is not money*".

- Challenges: resistance to change and reputation

Causal logic- C**ontrasting missions:** the new perspective is the private sector's one, which is very different in terms of values and habits from the NGOs one; this is the reason why the humanitarian actors resist to the change. In addition, the collaboration with the private sector determines an issue for the NGOs in terms of reputation. Indeed, it is typical of the humanitarian sector that when money or profit oriented actors are involved it is necessary to prove that their aims are compatible with the humanitarian one. The humanitarian agencies are scared to lose their reputation of neutrality and impartiality. The interviewee says "*you know, people are very concerned about protecting their reputations as individuals […]; unfortunately the burden of evidence seems to be on the shoulders of people involved in procurement and supply chain and logistics to prove that they are not corrupt, rather than the other way around. So, the whole environment is, you know, is an environment of disincentivizing of any kind of models, procurement methods or any kind of collaborations which are not, not the black and white*."

Secondly are investigated the elements influenced by **Private Companies = Manufacturers/ Suppliers (profit motivation)**

- Institutionalization - formalized agreement:

Causal logic- Profit motivation and to define obligations: The presence of formalized agreement, especially commercial agreements it is influenced by the private sector presence for two consequent reasons. Firstly, the private sector motivation here is the profit and so they have commercial relations with the partners as a result they want well-defined obligations and transactions. So, they use some simple agreements related to price and commercial obligations.

- Coordination mechanism- decision making- Lack of steering group:

Causal logic- Competition - The suppliers are competing on the profit/margins and so they have commercial sensitiveness that they do not want to share with the competitors. As a consequence, they are unwilling to have a mechanism of steering group where they should share with all the partners this critical information.

3.The promoter of the project implemented in the case E is $NGO_{E3.}$ It initiates the collaboration, selects the actors, retrieves funding, facilitates the discussion with the government and coordinates the major activities. The centrality of their role in the development of the project determines that presence of a **central coordinator** could be considered a CCF in the collaboration as it is summarized in the map below (Figure 6.12).

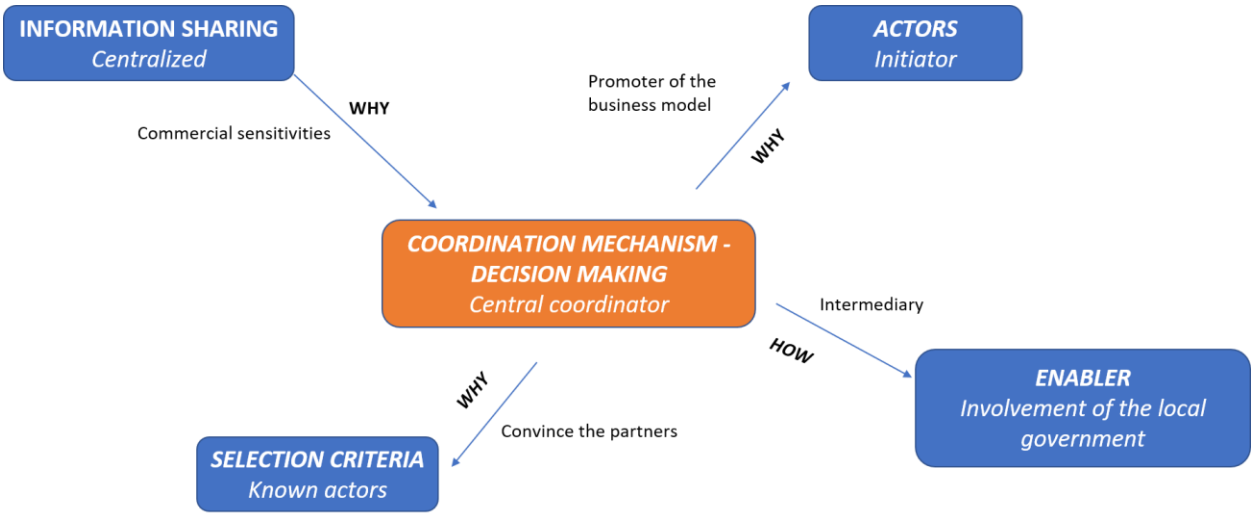

Figure 6.12: Central Coordinator map - Case E

- Actor: Initiator

Causal logic- Promoter of the business model: NGO_{E3} believes in the success of the innovative business model of the pooling of the resources. It identifies the other NGOs who want to participate and finance this initiative, investors, private companies and to involve the local government in the initiative.

- Selection criteria: known actors

Causal logic- Convince the partners: NGO_{E3} is aware of the fact that it is a great effort for the NGOs to be involved in an innovative project which requires pre-financing, and that this request is out of their usual strategic models. For this reason, the central coordinator selects the potential partners starts from the known actors trying to convince them in involving the collaboration. In addition, NGO_{E3} is responsible also to selects PS_{E1}.

- Information sharing: Centralized

Causal logic- Commercial sensitivities: In this collaboration NGO_{E3} is the only one who has visibility on all the aspects of the supply chain because each actor shares the information with it but not with the other members of the SC. This management of the information is due to the unwillingness of the organizations involved to share with all the partners their commercial sensitivities.

- Enabler: Involvement of the local government

Causal logic- Intermediary: the government enables the collaboration because it allows to the companies involved to produce without paying duties and taxes and to operate in the Export Processing Zone to export the production also outside Kenyan borders. This is possible because NGO_{E3} as a central coordinator is the intermediary among the partners and it has facilitated the discussion with the government to involve it in the project.

Case E – CCF summary

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Pooling of resources	Resource sharing	6
Private sector	Actors	7
Central coordinator	Coordination mechanisms – decision making	4

Table 6.5: CCFs summary - Case E

6.1.6 Case F - Dorian response SC

In this case of study there are mainly two elements that can be considered as critical.

1. First of all, it seems that the **community sense** that characterized Bahamas is a key **enabler** and thus a critical aspect of this specific disaster response. Indeed, the respondent asserts: "*it's not as if you're dealing with a stranger. You're dealing with either your family member or your friends' family*" and so you trust each other. However, a more general perspective can be taken in analysing the nature of this enabler: it is the presence, in a very peculiar way, of strong **previous relations** that exist among the actors before the disaster takes place.

The elements influenced by the previous relations are shown in the CCF map (Figure 6.13) and further described, they permit to define the element as critical.

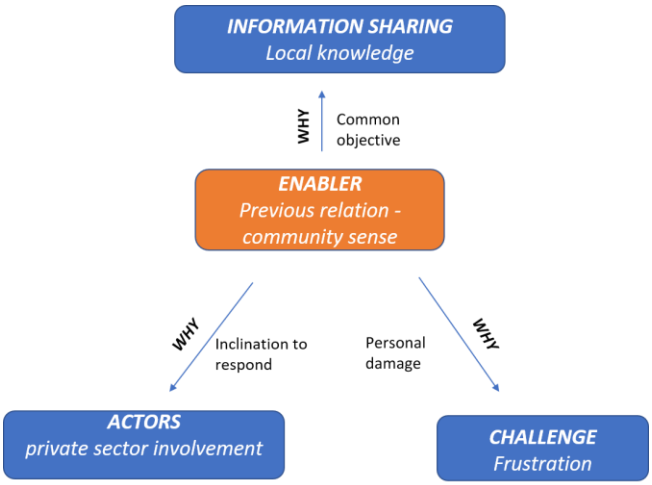

Figure 6.13: Previous relations map - Case F

- Information sharing: Local knowledge

Causal logic- Common objective: The community sense influences the information sharing. Indeed, the PS_{F1} is the one who provides the local knowledge to the international NGOs: "*we provided the [...] local flavour in terms of knowledge, how to get there, what to do, what's the culture there*". The two actors have the same common objective: they want to increase the efficiency of the disaster response operations. The presence of community sense permits to PS_{F1} to know well the local specificities and it is ready to share this knowledge in order to support the international actors.

Challenge: Frustration

Causal logic- Personal damage: the trust is due to the high level of community involvement, but this latter can also create high tension and anxiety. The people who are affected by the hurricane are your families, friends and everybody is scared to lose them; in addition, there is not a real plan, not certain things to do.

- Actor: Private sector involvement

Causal logic- Inclination to respond: The strong sense of community makes the private sector perceive themselves as part of a unique body, the Bahamas. So, they have a "*basic inclination*" to respond to this emergency.

2. Secondly a critical element of Case F is the engagement of the **private sector.** Indeed, the private sector was the real initiator of the disaster response.

The elements influenced by the presence of this type of actor are shown in the CCF map (Figure 6.14) and further described, they permit to define the element as critical.

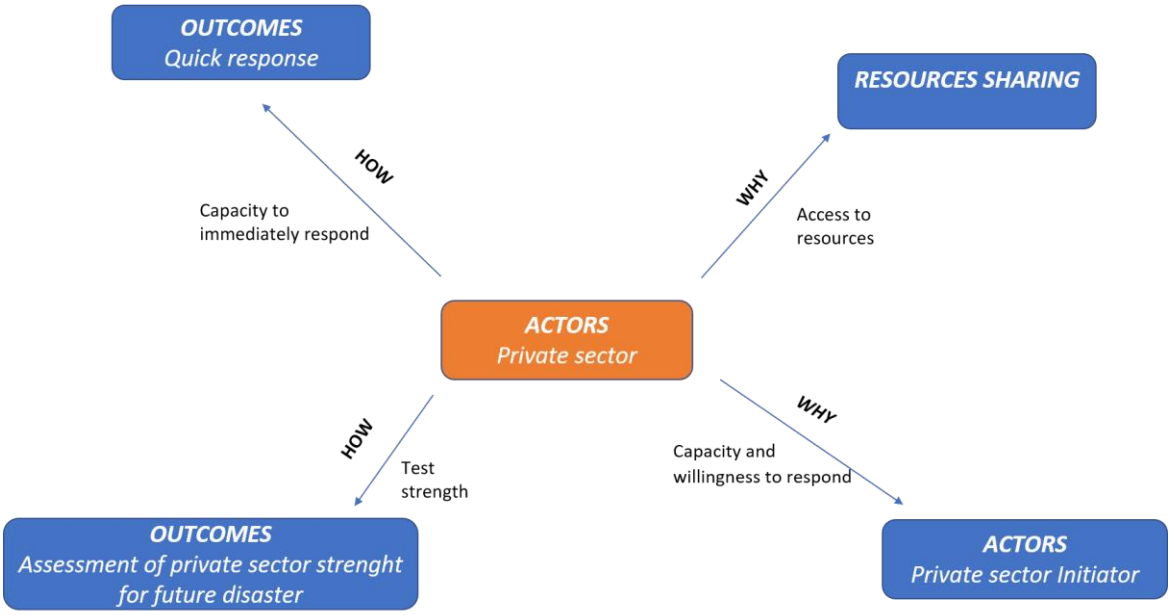

Figure 6.14: Private sector map - Case F

- Actors: Private sector as initiator

Causal logic- Capacity and willingness to respond: It is the initiator of the immediate response and of the collaboration. "T*he private sector was really the ones that led the initial response and the sustained response. They put up a lot of resources, a lot of money, a lot of hours, a lot of equipment to make sure that the initial response for the first 8 to 10 weeks after Dorian was predominantly private sector*". In this sense their involvement has influenced the initiator role, they are the ones who have the capacity to immediately and quickly respond and they have this

"*basic inclination*" explained by their community sense and the fact that their own business is damaged.

- Resources sharing

Causal logic- Access to resources: The private sector itself is the one who owns and provides the majority of the resources (money, equipment, vehicles...). They strongly influenced the resource sharing because they give access to this resources that otherwise would not probably be so easily available.

- Outcomes: assessment of private sector's strength for future disaster

Causal logic- Test strength in the response: The huge involvement of the private sector in the response permits a sort of qualitative outcomes: the assessment of private sector's strength. The respondent reports that Dorian is "*an opportunity to assess just the strength of our private sector and the availability of resources and how best to manage those resources in quiet time."* During the response they can test what is their real capacity that is then evaluated with the possibility of being better used in the future disasters.

- Outcomes: Quick response

Causal logic- Capacity to immediately respond: In the immediate response the private sector quick engagement has permitted to respond immediately even without waiting the arrival of the INGOs or of the government who came along the time. This fast involvement is possible thanks to the capacity they have in terms of resources and willingness.

Case F – CCF summary

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Previous relations	Enabler	3
Private sector	Actors	4

Table 6.6: CCFs summary - Case F

6.1.7 Case G - Yemen medical distribution to IDPs

Two critical elements are identified in this last case.

1.A first critical element for the collaboration is the presence of the donor. Without funding no humanitarian project is feasible. In case G the donor is ECHO, a big international player. So, the funding requirements and regulations are standardized to enable the donor to keep the control over the project. These boundaries set by the donor are reflected on different aspects of the collaboration.

The elements influenced by the presence of the donor are shown in the CCF map (Figure 6.15) and further described, they permit to define the element as critical.

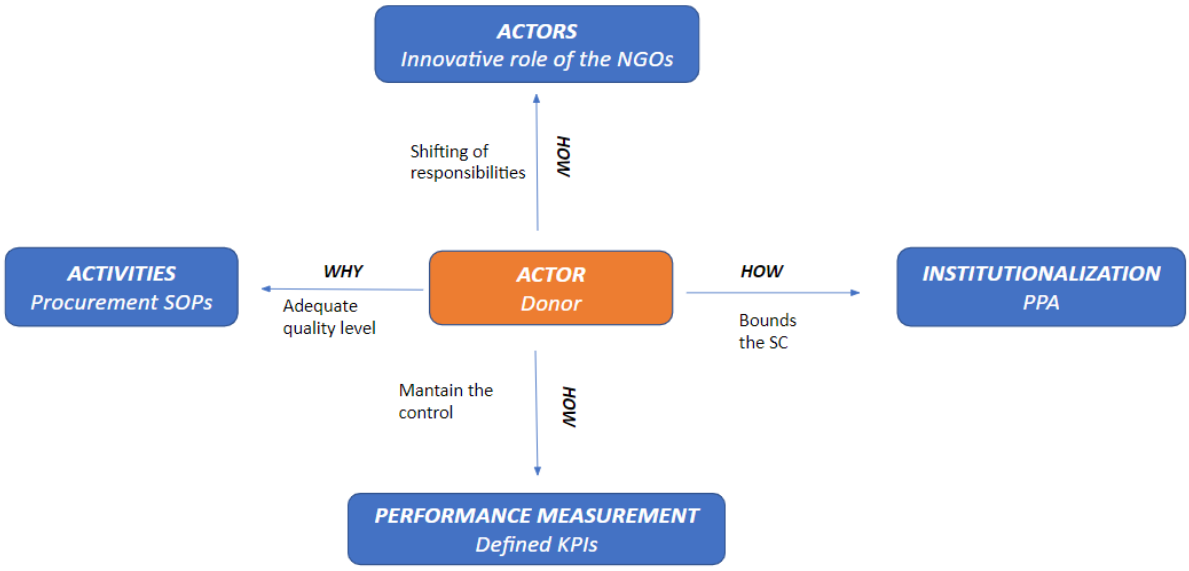

Figure 6.15: Donor map - Case G

- Institutionalization: PPA agreement

Causal logic- maintain control: When the donor and the NGO_{G1} commit to collaborate they sign a specific agreement (PPA) which specifies two main aspects: the regulations to set the action of NGOs and objectives NGO_{G1} should achieve with the budget provided by the donor. An international donor needs to set these boundaries on a formalized contract because it is not possible to control daily the action of the NGO, but it wants that its money is used for the agreed objectives and activities.

- Performance measurement: Defined KPIs

Causal logic- maintain control: When the donor and the NGO_{G1} establish in the agreement the objectives that the NGO_{G1} should achieve with the budget provided by the donor, they specify also the KPIs to measure the achievement of these objectives. It is important to specify them because it is an objective way used by the donors to verify if the NGOs are respecting the agreement or not.

- Activities: Procurement SOPs

Causal logic- adequate quality level: The regulations set by the donor deal also with the procurement: they establish some rules which affect the procurement process of the NGOs to guarantee an adequate quality level of the supplies.

- Challenges: donor regulations

Causal logic- bound the NGOs' SC: The donor actions could determine some challenges for the collaboration itself as the respondent says: *"the supply chain is very constricted by donors regulation when they give us grants".* This is challenging because the donor imposes some

regulations a priori without consider the specificities on the ground of the project. Build an efficient supply could be more difficult if they have to take into consideration also these additional rules.

2.The second key element is the presence of the **Government:** this type of **actor** is in some way imposed in the collaboration. The respondent says "*if you are in a country with the medical projects, you have to collaborate with the Ministry of Health. There is no other way*".

The elements influenced by the presence of the government are shown in the CCF map (Figure 6.16) and further described, they permit to define the element as critical.

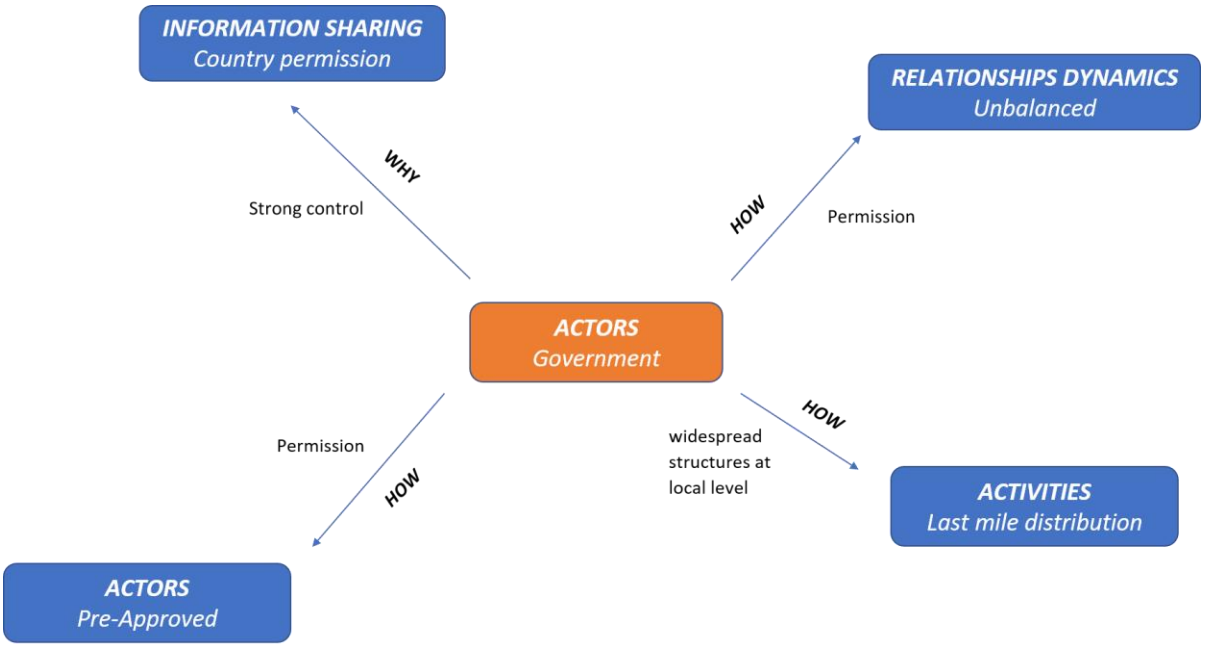

Figure 6.16: Government map - Case G

- Relationship dynamics: unbalanced

Causal logic- Permissions: The government presence strongly influences the relationship dynamics of the collaboration: the NGO_{G1} is "*very bound to the decisions that they* [the government] *want to make*". This unbalanced relation is explained by the fact that the government is the one which gives permissions on different aspects: "*they can decide if you can implement a project or not, they can decide what how the product has to be designed. So, they can decide to exclude or include an international NGO into the country*". This strong power obviously results in the dynamics of the collaboration.

- Information sharing: country permission

Causal logic- Government's strong control: In the case it seems that among the knowledge shared there is information about the government's permission progress or the process to obtain them, etc. Probably they are shared between the collaborative partners because the government has a strong control and it could forbid different activities of the collaboration such as the import

of goods. To face the issues related to the permissions the partners share the knowledge developed about it.

- Actors: pre-approved

Causal logic-Permissions: The presence of the government influences which actors are involved in the collaboration: only approved actors can be included. The respondent reports "*So, they* [the government] *can decide to exclude or include an international NGO into the country*". Without the government permission some actors cannot even be considered in the collaboration.

- Activities: distribution medical drugs and equipment

Causal logic- Widespread structures at local level: The last mile step of the distribution in this case is performed by the government. In particular the health centers provide health services and drugs to the beneficiaries. This is possible because the government has a widespread network which could supply directly the beneficiaries.

Case G – CCF summary

CCF (case element)	Collaboration dimension	# relationships with other collaboration dimensions
Donor	Actors	4
Government	Actors	4

Table 6.7: CCFs summary - Case G

6.1.8 Synthesis table: CCFs across the case studies

After the identification of all the CCFs in each case, in order to facilitate the cross-case analysis, a synthesis table is built (Table 6.8). As it has been made for each case in the CCF summary, the case element and the collaboration dimensions which it belongs are reported in the first two columns. Then it is identified in the different cases when this element is present: when the CCF is present the number of relationships it has with other collaboration dimensions is reported.

CCF (case element)	Collaboration dimension	Case A	Case B	Case C	Case D	Case E	Case F	Case G
Presence of agreement	*Institutionalization*	7	5					
Previous relation	*Enabler*	3					3	
Government	*Actors*	5						4
Central coordinator	*Coordination mechanisms*		5	7	4	4		
Private sector	*Actors*				4	7	4	
Pooling of resources	*Resource sharing*					6		
Donor	*Actors*							4

Table 6.8: Synthesis CCFs across cases

As it is possible to see mainly seven elements are identified as CCFs.

These elements will be later used and further analysed in the cross-case analysis. These case-elements are the starting point for answering to the RQ3: *"Among the collaboration elements, which are the more recurrent and relevant patterns?"* Other information is available in the cross-case analysis (6.2 Cross-case analysis).

6.2 Cross-case analysis

The cross-case analysis aims to explore deeply the elements of the cross-sector collaboration across the different cases to answer the third research question: "*Among the collaboration elements which are the most recurrent and relevant patterns?"*

The elements analyzed in this analysis are the CCF identified in the within-analysis. The implicit assumption under this choice is that the relevant patterns are related to these CCFs.

Each CCF is analyzed across the cases following 2 steps:

1. *Data on the CCF*: The starting point of this step is the collection across the cases of all the information related to the dimensions influenced by the CCFs. However, this is not an exclusive criterion: other features and data are included as they seem relevant to compare the different cases.
2. *Patterns in the data*: The second step aims to understand the reasons for the centrality of the case-element (why it is critical) in some cases and not in the other ones and if there are some common patterns or some differences. The outcomes of this process are summarized in *insights* (when they are just describing the patterns present) *or suggestions* (when from the patterns are derived some indications about how to configurate these elements or about how they impact the criticality). Then, they are logically justified and critically *compared with the existing literature* to corroborate their consistency, enrich them or identify the weak points.

Before presenting the results of the analysis some specifications are required.

- Firstly, in the analysis it is not always possible to retrieve the features of the case-element and dimensions selected for all the cases. Therefore, if it is possible to reliably assume the missing data (e.g. because they are implicitly supposed by other explicit information), the data are included in the analysis and the assumptions specified; otherwise the data will remain missing.
- Secondly, we will only report elements that are significant for the aim and scope of the analysis.
- In addition, the analysis of some CCF has not resulted in consistent results; therefore, the cross-case analysis consists just of four sections, each one related to one of the most relevant CCFs: the private sector, the presence (and role) of the government, the central coordinator and the presence of agreements.

6.2.1 Private sector presence

As it is possible to see from the within analysis the presence of the private sector is a CCF in three case studies. For this reason, the analysis of this element's criticality is extended to a comparison across the cases. The section below reports insights recognized across patterns of the cases and suggestions formulated to collaborate with this actor. However, from the data collected in this research it is not possible to identify a unique reason that explains the criticality of the element.

1.Data about the private sector

The within analysis, in the different cases, has highlighted some features of the private sector that are significant to compare the presence of it and other characteristics seem relevant: they are all summarized in the table below (Table 6.9):

1. *Private sector partner*: if the private sector is present in the case. Specifically, if it is present it is reported its name.
2. *Consortium partner*: if the private sector is involved in the decision-making mechanism of the case present. Specifically, if it is a partner in the collaboration consortium (**YES**) or not (**NO**).
3. *Source of expertise*: If the private sector represents a source of knowledge and innovative information for one or more partners of the collaboration (**YES**) or if it does not clearly share with the partner its expertise (**NO**).
4. *Source of resources*: If the private sector provides specific resources to one or more partners of the collaboration (**X**) both with a commercial transaction or a real sharing of resources. Especially the type of resources is briefly reported.
5. *Added-value*: If the private sector involvement determines better outcomes of the collaboration (**YES**) and consequently can be classified as an actor that adds value or not (**NO**). If it is present a better outcome, specifications on the type are reported.
6. *Private sector interest*: what the private actor gains participating in the collaboration project.

In the case E two different types of private sector representatives (PS_{E1} and the suppliers) are involved and they are analysed separately.

CASE CODE	PS partner	Consortium partner	Source of expertise	Source of resources	Added-value	Private sector interest
A	Private $Company_{A2}$	**YES**	**YES**: generic expertise	No available data	**YES**: higher expertise	No available data
B	Private $company_{B2}$	No available data	*ASSUMPTION 1* ***YES****: Knowledge management*	No available data	No available data	No available data

C	LSPs	**NO**	**NO**	**X**: logistic capacity	**YES**: higher capacity	The LSPs have a working capacity not exploited due to the war situation
D	Supermarkets	**NO**	**NO**	**X**: food, plastic voucher	**YES**: higher efficiency, higher satisfaction	The supermarkets have a working capacity not exploited due to the war situation
E	PS_{E1}	*ASSUMPTION 2* ***YES***	**YES**: business model	**X**: warehouse	**YES**: higher efficiency	CSR motivation, they obtain publicity and brand visibility
E	Supplier for the kits	**NO**	**NO**	**X**: kits' items	**YES**: availability of resources	*ASSUMPTION 3* The creation of a local economy implies a market for their business
F	PS_{F1} and other local private companies	**YES:** daily briefings	**YES**: in the recovery projects, local knowledge to NGOs	**X**: fundings, vehicles, etc	**YES**: availability for the majority of resources used	Everything is destroyed, so they get involved to rebuild also their business and a local economy
G	PS_{G1} and LSPs	**NO**	**NO**	**X**: logistic capacity	*ASSUMPTION 4* **YES***: no challenges identified and provide the capacity needed*	*ASSUMPTION 5* The LSPs have a working capacity not exploited as due to the war there is not a market

Table 6.9: Private sector features

<u>Assumptions in the Table 6.9:</u>

1. From other primary sources the company is expert in the field of Knowledge management. For this reason, it seems reasonable that the company can be seen as a source of expertise.

2. PS_{E1} seems a relevant actor in the hypothesized consortium between the two INGOs and the central coordinator. It is supposed the existence of this consortium, but it is not proven due to the lack of other sources.
3. The private sector (suppliers of the survival kits) is assumed to be interested in encouraging the local economy to have a market. It seems reasonable because R1 reports that "*there were a lot of new jobs created, because manufacturing was moved to Kenya*".
4. In this case the private companies' presence do not rise any challenges, it seems reasonable that their presence adds value to the collaboration providing the resources and capacity needed.
5. In this case due to the fact that there is a destroyed market it seems reasonable the same interest of the case C: the LSPs have a working capacity that is not exploited by the business market.

2. Patterns in the data

Firstly, what can be observed is that in all the projects the private sector is involved.

A question can rise: why is an actor with for-profit mission involved in projects that are aiming to a humanitarian mission?

Indeed, also in the literature the authors identify the challenge of involving the private sector in the disaster relief. For example, Nurmala et al., (2017) evidence that the humanitarian organisations tend not to involve private companies because "it takes long to get to know the humanitarian sector – time that a private organization may not have or may not be willing to spend".

To answer to this question, it is necessary to analyse separately the perspectives and the reasons of humanitarian actors and private companies.

Humanitarians' view

From the "Added-value" column it is possible to observe that the presence of private sector permits in all the cases (excluding case B where the data are not available) to achieve better outcomes. In particular, higher efficiency and availability of resources are the two main outcomes of the collaboration due to the private sector presence.

Insight (1): **the presence of the private sector always positively influences the outcomes of the collaboration.**

The reason of this success seems explained by the fact that private sector compensates lacks in the HSC. Indeed, the private sector introduces resources that are limited in the humanitarian aid context, it is a source of

Expertise (e.g. case E the private sector has knowledge of the innovative pooling of resources because it is typical of the business environment)

Resources (e.g in case F the private sector is the only one who can immediately provide the resources or in the case C the LSPs give the necessary logistic capacity to scale the project).

So, the private sector involvement in the humanitarian aid context brings elements that are scarce, and the NGOs need this actor to obtain them and to have a better outcome of the project itself.

In the literature sample analysed there are some confirmations of the Insight (1): Vega & Roussat (2015) identify the presence of LSPs as a way to improve relief logistics thanks to their highly performing logistics services. Their strength is due to their focus on cost-efficiency and the availability of the needed logistics capacity. Similarly, other scholars (Li et al., 2019; Bealt et al., 2016; John et al., 2018; Lu & Xu, 2015; Moore et al., 2003; Stephenson, 2005) confirm the access of resources as a good motivation for the HOs to start collaborating with the private and obtaining a higher efficiency. These characteristics are exactly the same outcomes present in some projects of the sample analysed and what the NGOs can "gain" from these relations.

Private sector view:

From the column "private sector interest" of the Table 6.9 emerges that in all the cases the private sector has an interest to get involved in the project. For example, in the case C the LSPs cannot use their work capacity because there is not a real market and the humanitarian aid distribution can become their main business opportunity. This "gain" also from the for-profit perspective is interesting and can permit a further suggestion.

From the analysis of the two perspectives (humanitarian and private sector) and the observations discussed, it is possible to conclude that:

Suggestion (1): **The collaboration with the private sector is successful when its involvement is a win-win relationship.**

Indeed, in the cases analyzed the relations seem win-win when both the parties need and earn from each other. On one hand the collaborative outcomes linked to humanitarian aims are higher (e.g. the HOs have a higher efficiency). On the other hand, the private sector has an interest in providing a good service (that can be not linked to the social aim): it can gain something and if the relation goes wrong it will lose this award. As a result, this mutual interest could be the key aspect that permits a successful relation.

The literature gives some contribution to this result:

A confirmation is David Swanson & Smith, (2013) opinions: they confirm and give some interesting specifications on the suggestion (1). Indeed, they confirm the necessity of a win-win relation between the two parts, but they add that these earns cannot be achieved on the short-term. They assert that the value of participating in these projects is a "s*hared value*" that is "*capable of resulting in tremendous long-term economic value for the firm because it is about expanding the total pool of economic and social value*". This point emerges from the case E of our sample: the CSR gain is probably not an immediate economic benefit for the private sector, but it creates benefit on the local economy and a positive social impact which will bring a gain for the private

sector itself on the long run. In addition, other scholars (Li *et al.*, 2019; Balcik *et al.*, 2010; Jordan & McSwiggan, 2012; Vega & Roussat, 2015; Maon, Lindgreen, Vanhamme,2009) confirm the possibility for the private companies to "*gain*" from their involvement but without identifying it as an essential condition for a successful collaboration.

Secondly Falagara Sigala & Wakolbinger, (2019) add an insight to suggestion (1): they identify as differentiator for the success of the LSPs-HOs partnerships the development of them during different phases. Indeed, the partnership's success could be determined by the creation in the preparedness phase when the private companies and the HOs have the time to invest in and negotiate the terms of the relations. However, the HOs generally have a lack of funds during this phase. In the sample analysed, some cases are the proof of this: for example, case E has been developed with the aim of preparedness, but the lack of funds is one of the reasons why the collaboration is ended. On the other hand, the case F contradicts this idea: the private sector is even the initiator of the immediate response and it is getting involved also in the recovery projects (so with a long-term perspective maybe). As a result, it seems that the disaster phases cannot be the differentiator for the success of the collaboration with the private but further research is needed.

Also, Binder and Jan Martin Witte (2007) seem to confirm the result of suggestion (1) because they say that a condition for commercial engagement in humanitarianism is that it falls according to the opportunities in the market. Nonetheless, they say that commercial actors might be able to present themselves as efficient for humanitarians, but this is probably convincing only in the short term because the inefficiencies in humanitarianism partly stem from market imperfections, such as information asymmetry and particular incentive structures. It is possible to reflect this contribution to case E because the private sector involvement determines higher efficiency in the humanitarian operations, nonetheless the asymmetric information sharing is underlined as a challenge to the achievement of this efficiency.

A third observation that seems relevant is related to the identification of patterns among the cases looking at the features of the Table 6.9 (*Consortium partner, source of expertise, source of resources)*. These patterns could be justified by the existence of two profile of relations, or better two different level of partnership: **operational or strategical**

Insight (2): **When the private sector is involved the relation can be at two level, operational or strategical.**

- **Operational**: it is an outsourcing relation; the private actor is not involved in the decision making (it is not a consortium partner) and it is just a source of resources for the collaboration.
- **Strategical**: it is a more collaborative relation; the private actor is involved in the decision process (it is a consortium's partner) and it provides the expertise and not just the resources.

As it is possible to see from these definitions, an operative definition can be derived and it allows to determine the profile of the relation with the private sector in all the cases excluding case B where the data are missing (Table 6.10):
Strategical if the private sector is a *consortium partner* and a *source of expertise*
Operational if the private sector is *not a consortium partner* nor a *source of expertise*

Case Code	Level of relation
A	Strategical
B	No available data
C	Operational
D	Operational
E: PS_{E1}	Strategical
E: supplier	Operational
F	Strategical
G	Operational

Table 6.10: operational or strategic level

The presence of these two levels seems reasonable: firstly, it is typical of the collaboration in the SC between business partners and it is even more important in the collaboration between actors of two different sector. Secondly it is clear that if the private sector is just a passive actor that gives donations (cash or in-kind ones) or sells its service providing resources (e.g. Case C), the relation is very different compared to the one of case E (PS_{E1}). Indeed, in this case this actor is involved actively: it is trying to help the introduction of the pooling of resources sharing its expertise. Obviously, the relation needs to be different: this partner has the right to be considered and involved in the decisions.

The literature exactly confirms the presence of these two levels of relations when there are involved the private companies. Balcik et alt.(2010) identify the presence of business-humanitarian partnerships that can be strategic, in which the "*private sector company shares its expertise and resources to improve relief chain logistics in a more systematic way. Such partnerships are generally long-term and involve significant resource commitment and joint planning*". The scholars also identify more operational relations as the commercial or philanthropic ones that are typically short-term and spanning only the disaster relief period.

Also Falagara Sigala & Wakolbinger, (2019) reports the lack of a strategic perspective in the collaboration between LSPs and HOs; the HOs to outsource to LSPs just not critical operations which not imply the sharing of critical information.

Nurmala, de Leeuw, & Dullaert, (2017) remark the existence of these two levels and especially they confirm the presence of strategic partnership that are long-term partnership with more opportunities for the humanitarian sector learning from the business experience.

A point of attention is that from the literature the lasting of the relation is a key differentiator for determining the two levels, however in this analysis this factor is not highlighted. Indeed, the Case A is a result of previous projects and from some aspects of the collaboration (selection criteria or coordination mechanisms) it seems a more long-term relation; however, on the other hand, the collaboration project is a pilot with a duration of 18 months. Also, the case E willingness is more long-term: it is an open-ended project and a pilot with the intention of scaling up in case of success. However, the effective duration is 1 year and half. Finally, the case F has just some signs that can be long term: the collaboration with the private is going on in the recovery projects. At the same time the case C and D have yearly contracts with the LSPs: the willingness of the relation is short-term but maybe the relations are keeping on since the beginning of the projects in 2011. As a result, in parts what can be confirmed also from the sample analyzed is that the willingness of a more short/long relations, with often short-term contract or longer, could be typical of the operative/strategic case. On the other hand, the effective duration of the relations is not the same of the willingness and it can maybe drive the level. So, not enough evidences are available to conclude and include this aspect in the definition.

6.2.2 Government presence

The presence of the government in the collaboration is emerged as a critical factor in two different case studies. For this reason, the analysis of this element's criticality is extended to a comparison across the cases. The section below reports insights recognized across patterns of the cases and suggestions formulated to collaborate with this actor. In addition, a possible reason that explains the criticality of the element is identified.

1.Data about the government

The within analysis, in the different cases, has highlighted some features of the private sector that are significant to compare the presence of it and other characteristics seem relevant: they are all summarised in the table below (Table 6.11):

1. *Permission***:** If it is necessary the approval of the government to implement the project (**YES**) and it gives other type of permissions or if it is not (**NO**)
2. *Coordination mechanism:* If the government is responsible for the coordination of the collaboration project (**YES**) or not (**NO**)
3. *Activities:* If the government performs one or more main activities of the collaboration project (**YES**) or not (**NO**)
4. *Dedicated governmental structure:* the presence of a governmental structure that is involved in answering to the collaboration needs (**YES**) or not (**NO**).

In addition, it is reported in a separated column in which cases the government is pinpointed as critical in the within analysis.

5. *Critical:* If the government is critical (**YES**) or not (**NO**)

Case code	Permission	Coordination mechanisms	Activities	Dedicated governmental structure	Critical
A	**YES**, Ministry of Health gives the mandate	**YES**, NMEC is the central coordinator	**YES**, it gives the necessary support in accessing the communities, the health facilities and the stakeholders	**YES**, NMEC and the District Health Management Team	**YES**
B	**YES**, Ministry of Health approves the project	**NO**	**YES**, the Ministry of Transport organizes transport and selects drivers	**NO**, Madagascar health system is a "weak and severely constrained system"	**NO**
C	**YES**, Syrian government gives the approval and exempts import from taxes	**NO**	**NO**	**NO**, Syrian government that is unstable	**NO**
D	**YES**, Syrian government gives the approval and exempts import from taxes	**NO**	**NO**	**NO**, Syrian government that is unstable	**NO**
E	**YES**, Government allows PSs companies to operate in the Export Processing Zone and exempts import from taxes	**NO**		**NO**, the project is public, and it is asked to enhance the local economy	**NO**
F	**YES**, Government allows the INGOs work	**YES**, NEMA is the coordinator	*No available data*	**YES**, NEMA	**NO**
G	**YES**, Ministry of Health gives the permission	**NO**	**YES**, the Primary Health Centers distribute drugs and health services to the beneficiaries	**YES**, Primary Health Centers	**YES**

Table 6.11: Government features

2.Patterns in the data

A first observation is that the government is always involved in the collaboration projects analyzed. However a specification it is necessary: in this research the government category includes also the "*public authorities*" which are governmental agencies of all levels (2.2.3 Government).

A second observation that seems relevant is related to the identification of patterns among the cases looking at the features of the Table 6.9 (*Permission*, *Coordination mechanism*, *Activities)*. These patterns could be justified by the existence of two different role that the government has in the collaboration:

- **Active role**: If the government coordinates or directly performs one or more main activities of the collaboration project (e.g. distribution to the beneficiaries).

- **Passive role**: If the government enables the collaboration project without coordinating or taking part directly to any of the collaboration activities (e.g. it just permits an exemption of the import taxes).

In the Table 6.12 it is represented the classification of the collaboration role of the government in the different cases:

Case code	Collaboration role	Critical
A	**Active**	**YES**
B	**Passive**	**NO***
C	**Passive**	**NO**
D	**Passive**	**NO**
E	**Passive**	**NO**
F	**Active**	**NO**
G	**Active**	**YES**

Table 6.12: Government collaboration role

Specification: NO*. The case B is not defined as active even if the Ministry of Transport actively participate to the collaboration organizing the transport and selecting the drivers. This is because the reference part of the government for the project is the Ministry of Health which approves the project. The Ministry of Transport is involved in the collaboration by the central coordinator because it is the only body which organizes the transport in Madagascar. It is clear that the context is very different: this ministry is not as other governmental agency (e.g. case A) that supervises or leads the project.

In addition, composing the information from the Table 6.11and Table 6.12 it is possible to observe that in the critical cases the government plays an active role in the collaboration. As a result, the following suggestion is highlighted:

Suggestion (2): **The presence of the government is critical when it has an active role in the collaboration.**

The reason of this criticality could be justify by a simple idea: if the government plays a passive role it is just an actor that should be consulted and involved in terms of permission it has a marginal role and the collaboration is not strongly influenced by it (e.g. Case C); while if it is operatively involved in the collaboration or better when it has an active role, it has the authority and the strength to shape the collaboration: it is supported by its authority, the local presence, it has established network and it is generally a key beneficiary of the project (e.g. case A).

However, the suggestion (2) can be argued by a more detailed study of the case F: Indeed, this case seems contradict the suggestion (2) because it is active as it is the central coordinator but it is not considered critical. Nonetheless, the government was an active player in Dorian response after some weeks and it has emerged as central coordinator over the time. Maybe this is the reason why it does not play a critical role in Dorian response. This thesis is supported by the fact that in the recovery projects the government assumes a central role, because it was an active presence in these projects since the beginning.

In addition, from the literature a support for the case F government reaction is available: the government tends to slow and inefficiently respond during the first days of the relief effort (Curtis, 2015), even if a strong authority role is expected from it (Van Wassenhove, 2006). However, the role of the government can improve in efficiency and quality during the recovery because the relations between NGOs and government allows to effectively combine the efforts(Xu et al., 2018).

A second observation is that the local government has always the responsibility necessary to establish a collaboration, but it is not always responsible of the coordination of the projects as highlighted in the Table 6.11 (*Permission, Coordination mechanism, Dedicated governmental structure* column). This leads to a further specification which explains the role of the government in the collaboration:

Insight (3): **The government is always responsible to approve the project, but it is responsible to coordinate the actors if it has a structure dedicated to serve the aim of the project and it is an adequate structure.**

This insight can be verified by the cases available: firstly, it is true that in all the cases the government approves the project. Secondly in the case A and F it has also a coordinating role: in A the NMEC is linked to the District Health Management Team that are at a district level. It seems that this structure, that pre-exists before the collaboration, is exploited during the collaboration and gives to the NMEC a coordinating role. Similarly, in case F the NEMA agency is a structure dedicated to disaster management and it was prepared before the disaster: there is no reason to not exploit it in the response. On the other hand, the case G does not follow this rule because there is a dedicated structure, but it is not coordinating. However, it is necessary to consider that the Primary Health Centers do not have an adequate size, power, resources to play the coordination role in an international SC.

The insight could be further supported by literature contributions: firstly, it is confirmed the observation that no international action can be taken if the local government does not authorize it (Cozzolino, 2012; Day *et al.*, 2012).

Secondly it emerges the suggestion that the governments tend to be more reactive than preventive because they have inadequate institutional capacity due to insufficient funding, inadequate skills and inappropriate processes that would support disaster prevention, mitigation and preparedness (Luna, 2001). This result seems to confirm by contrast the insight of this analysis.

Furthermore, Balcik et alt., (2010) suggest that even if the government has the authority, it may lack of the necessary experience and knowledge to lead the disaster and this could create a lack of coordination and ineffective relieves. This could be a further step of this analysis; however, in the cases analyzed it is not confirmed because when the government has not a dedicated structure to lead the emergency, other agencies emerged as coordinators.

6.2.3 Central Coordinator presence

As it is possible to see from the within analysis the presence of the central coordinator is a CCF in four case studies (Case B, C, D, E). For this reason, the analysis of this element's criticality is extended to a comparison across the cases. The section below reports insights recognized across patterns of the cases and suggestions formulated about the presence of this coordination mechanism. In addition, a possible reason that explains the criticality of the element is identified.

1.Data about the central coordinator

The within analysis, in the different cases, has highlighted some features of the central coordinator that are significant to compare the presence of it and other characteristics seem relevant: they are all summarised in the table below (Table 6.13):

1. *Presence*: if the central coordinator is present in the case (**YES**) or not (**NO**). Specifically, if it is present which is its name.
2. *Selector*: If the central coordinator is the one who have the power to select the other partners involved in the collaboration (**YES**) or if it does not have this power (**NO**).
3. *Responsible of decision making*: If the central coordinator is the one who is responsible of decision making for the collaboration (**YES**) or it is not the last and unique responsible (**NO**). An assumption that seems reasonable is that if the central coordinator is not the unique responsible of decision making (**NO** case) generally the collaboration is balanced: the partners involved try to equally participate and be responsible in the decisions.
4. *Performance measurement*: If the central coordinator defines also the KPIs and the other partners report to him (**YES**), and eventually some specifications, or not (**NO**).
5. *Centralization of resources sharing*: if the resources, including also the information, are retrieved, owned and managed by a single actor (in this case the central coordinator) which then distribute them to the other partners (**centralized**) or if the resources and information are shared between all the actors involved in the collaboration but they are not owned and managed by a single entity (**decentralized**).

Case code	Presence	Selector	Responsible of Decision making	Performance measurement	Centralization of resource sharing
A	NEMC	**NO**	**NO –** there are steering groups and consortium	No available data	**Decentralized** – the data are shared among the partners and also resources
B	Non-profit organization$_{B1}$	**YES**	**YES**	**YES –** KPIs in the agreement	**Centralized –** the central coordinator receives the information and communicates to the ministry. Probably it manages also the founding, no data on other resources.
C	UN organization $_{C1}$	**YES**	**YES**	**YES –** KPIs to renew the partners	**Centralized –** the central coordinator receives and manages the information and the main resources (food rations, trucks, funds).

D	UN organization $_{D1}$	**YES**	**YES**	No available data	**Centralized-** the central coordinator receives and reports the information (about the beneficiaries details/ tracking of cash vouchers) and probably the main resources (cash vouchers, funds).
E	NGO_{E3}	**NO**	**YES**	**NO –** the KPIs are company-specific	**Centralized*-** the information is manged only by the central coordinator, but the resources are decentralized.
F	NEMA	**NO**	**YES**	**NO –** the KPIs emerge after the response	**Decentralized –** division in sector centers that share resources and efforts and the sectors' responsible meet daily so probably sharing also data on resources consumption.

Table 6.13: Central Coordinator features

Centralized* The case E is a very interesting project: the business model introduced is about the pooling of resources, so the management of the stocks and warehouse is decentralized. On the other hand the holder of the information is just NGO_{E3} and this is perceived as a challenge by PS_{E1} which suggests to match the sharing of resources with the sharing of information: "*I think collaborative planning, forecasting and replenishment is a proven model that gives better results than the traditional silos-based information sharing*".

2. Patterns in the data

A first observation is that the central coordinator, as a general mechanism, is present in the majority of the case studies. The only exception is the case G where it is not present a body that coordinates the actors. However, in this project the activities and the related responsibilities are well defined and highly standardized by a clear process: in some ways it seems that the standardization is what coordinates the actors involved.

A second observation is related to the identification of patterns among the cases looking at the features of the Table 6.13 (*Selector, Responsible of decision making*, *Performance measurement* and *Centralization of resources sharing)*, it seems relevant for all the cases excluding G. These patterns could be justified by the existence of two different two profiles of central coordinator: in this research they are named a **weak** and a **strong**.

Insight (4): **When there is a central coordinator in the collaboration it can assumes two types of profiles, weak or strong.**

- **Weak**: when the central coordinator is not a selector, nor responsible of decision making, nor defining the performance measurement and the management of resources is not centralized by it (decentralized).
- **Strong**: when the central coordinator is a selector, responsible of decision making, defining the performance measurement and the management of resources is not centralized by it (centralized).

At this point for each case study the central coordinator is defined as strong or weak. In the table below (Table 6.14) the definition is given according to the definitions and the dimensions above

with a majority rule: the cases are defined as weak or strong if they have at least three features over the four defined. The third column identifies in which case the coordinator is a CCF.

Case code	Central coordinator profile	CCF
A	WEAK	
B	STRONG	X
C	STRONG	X
D	STRONG	X
E	STRONG*	X
F	WEAK	

Table 6.14: Central coordinator profile

STRONG*: A point of attention is the case E: it is classified as strong because the management of the information is centralized, and it is the responsible of decision making. However, the collaboration is based on the pooling of resources, typical of a decentralized management, and the centralization of the information is considered a negative element of the collaboration. The researcher's opinion is that it is wrong the central coordinator profile. It is a strong central coordinator in terms of decision making but it is not necessary in this case, it is even negative. Also, R1 claims about the lack of a more balanced and democratic consortium where partners are more involved. This is typical, as explained before, of a weak central coordinator.

The presence of two profiles seems reasonable because the dimensions of the Table 6.13 are strongly different between the case A, F and all the other cases.

In addition, from the literature not specific scholars mention the presence of two profiles for the central coordinator but there are some results that can be linked to them. Different authors (Lu & Xu, 2015; Van Wassenhove, 2006) remark the definition of three categories of collaboration in the HSC by Antonio Donini (1996). He identifies coordination by *command, consensus and default*: the command category seems related to the strong profile where there is a central coordinator with agreement on responsibilities and objectives; while in the consensus situation the actors have access to compatible or shared mutual equipment and channels. They are not exactly the definition of strong and weak profile, but the management of resources and the decision-making aspects are strongly linked. In addition Steigenberger, (2016) defines centralized and decentralized coordination: in some ways he identifies two different profiles at least in terms of decision making. Balcik, Beamon, Krejci, Muramatsu, & Ramirez (2010) remark the existence of chain coordination mechanisms, particularly in the horizontal collaboration, that are linked to the resource sharing, information sharing and joint decision-making. However, no other specifications are given in terms of differences among these specific mechanisms.

In addition, from the Table 6.13 it is possible to see a pattern between the criticality of the central coordinator (CCF) and its type of profile. This pattern drives to the following suggestion:

Suggestion (3): **The central coordinator presence is critical when it is a strong central coordinator.**

The suggestion seems reasonable because a strong coordinator has the power to influence many other dimensions and collaboration elements. Indeed, the cases of weak central coordinator have other CCFs not linked to the coordination mechanisms. In these projects other elements influences the collaborative dimensions.

In addition, the presence of a strong central coordinator is critical because this strong power permits to shape the relations and the collaboration itself according to its view. This could be accepted or not by the other partners: obviously the success of the partnership will be determined by this aspect.

From the literature not specific scholars mention, as said, the presence of central coordinator differentiated by profile, and neither its criticality. However, there are some insights referred to the decision making and about a more centralized command (similar to a strong coordinator) and a decentralized one (as a weak coordinator). Especially Steigenberger, (2016) highlights how the presence of a centralized coordination and decision making affects other dimensions: a "*strong strategic planning and resource deployment and facilitate the development of a common operational picture. However, it is also demanding with respect to leadership, information processing and decision-making*". Finally, the author points out the coordinator responsibility of deciding which information to share, to not share too much information as well as to not share too little, but the necessary for decision maker. Independently from the content what is relevant, linking to the suggestion (4), is that also the information sharing is influenced by the coordinator.

Very interesting is the opinion of Akhtar, Marr, & Garnevska (2012): the presence of chain coordinator is key because it is involved in major decision making, leading, and controlling of main coordination activities (recruiting, managing staff, communication, allocation of resources and performance measurement). However, the authors do not differentiate between the two profiles, it seems that the criticality is independent from the strengths of the coordinator. On the other hand, they identify the lack of empirical investigation that identifies chain coordinators and explores their roles in HRCs coordination.

At this point it is possible to further investigate the reasons why these two profiles exist. Indeed, the idea that drives the following analysis is the fact that the configuration of a specific type of profile is adequate for a specific situation (literature gap identified by (Nurmala et al., 2017)), or better it changes according to the presence of specific collaborative dimensions.

Among the dimensions on which the analysis is focused (see 6.2 Cross-case analysis) two dimensions are selected that vary according to the type of profile: the *presence of trust* and the *geographical presence* of the central coordinator (local or international).

Central coordinator profile – Trust presence

Firstly, the relation is studied with the presence of a specific enabler: from the within analysis this enabler should be the CCF called "*previous relations*" that it is present in the case A and F. However, an assumption that is taken for the cross-case analysis is the redefinition of this enabler: the *trust* presence can be a better element to compare. Indeed, the previous relations among the actors are, in these cases, what create trust. The trust can be a stronger and more generalizable enabler that is probably what can really enhance the collaboration.
It can assume two values:

- **Strong trust**: if there are previous relations and it is quite immediate the presence of trust.
- **Weak trust**: if there are not previous relations and consequently the creation of trust can be established only when the collaboration starts.

In this case the easier way to identify the patterns seems to map the cases based on two axes: the central coordinator profile (weak and strong) and the level of trust (strong trust and weak trust). The Figure 6.17 represents the entire sample.

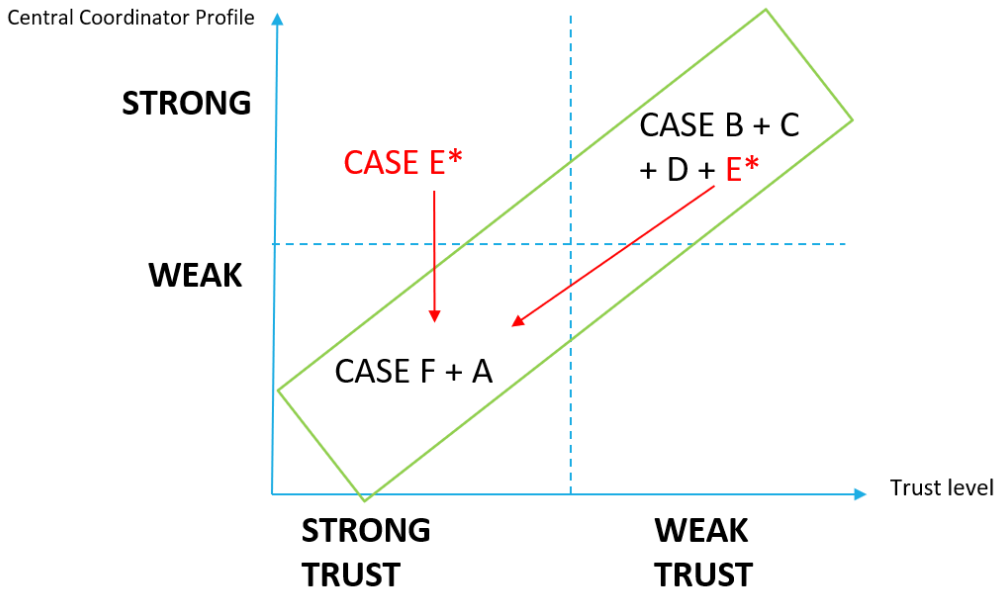

Figure 6.17: Central Coordinator Profile - Trust Level

A specification should be underlined: the case E. It is interesting because it has some specificities: the collaboration involves both partners with which there were some previous relations, so strong trust, and also some partners unknows so with a lower level of trust. In addition, as concluded before, the configuration of the central coordinator profile seems the wrong one: it is better a weak profile. The case should be moved to the same quadrant of case F and A.

The main pattern that can be identified from the map (Figure 6.17) is related to the presence of cases in the two respective quadrants, in two situations:

Insight (5): **The central coordinator profile changes according to the trust's level, two situations are identified:**

> **Situation 1:** When there is a **strong trust** due to previous relations, there is a **weak central coordinator** in the collaboration.
>
> **Situation 2:** When there is a **weak trust** due to previous relations, there is a **strong central coordinator** in the collaboration.

The insight is justified by the cases available in the map (Figure 6.17).
A possible suggestion could be related to the fact that no cases are present in the other quadrants, apart from Case E (but as explained above it seems that the configuration of the central coordinator profile is the wrong one), and that maybe the only possible situations are the situation 1 and situation 2.

Suggestion (4): **The only possible configurations of central coordinator profile and level of trust are the Situation 1** (strong trust and weak central coordinator) **and Situation 2** (weak trust and a strong central coordinator)

The suggestion could be reasonable from a logical perspective: if there is weak trust it is harder to establish a collaboration in general and it is maybe even impossible if there is nobody who have the responsibilities to the final decisions and someone who selects and verified the partners' performance. Indeed, what can explain the presence of weak coordinator with balanced relationship dynamics is that the partners trust and do not doubt of each other. Regarding the situation of strong trust and strong coordinator seems not realistic for a simple reason: if there are two parts that know each other and want to collaborate, generally nobody will leave its "*voice*" to be commanded by a partner. However, in some specific situation, like disaster response, could be possible that a partner obtains this higher power through, for example, a governmental mandate. But even in this case, in practice, probably it is easier to share the decision making.

However, no literature is available to confirm it. The only author that could be related is Steigenberger, (2016) who, as said, defined centralized or decentralized coordination in general. He also differentiates when it is better a centralized or a decentralized coordination: the scale and complexities of the operations, the presence of interorganizational dependencies drive to a stronger centralization requiring "*well-staffed and well-trained command*". These dimensions are not the ones of this analysis: the operations considered in case B and A are very similar (Malaria treatments) but the central coordinator's profile is completely different. However, the author considered is not speaking of a central coordinator, so the result is not completely comparable.

Central coordinator profile – Geographical presence

Secondly the actor dimension is analysed: at the beginning the type of actor (in terms of central coordinator) have been investigated but not consistent evidences have been reached. Indeed, dividing between profit and not-profit actors does not show any specific patterns.

As a consequence, another characteristic of the actor is observed as more relevant: its geographical presence.

Regarding this dimension the only assumption necessary is related to the two possible specifications that it can assume:

- **Local:** if the actor has his headquarters within the country where the collaboration takes place (for example it is a local NGO).
- **International**: if the actor has his headquarters outside the country where the collaboration takes place (for example the UN organizations).

Also, in this case the easier way to identify the patterns seems to map the cases based on two axes: the central coordinator profile (weak and strong) and the actors' geographical presence (local or international). The Figure 6.18 represents the entire sample.

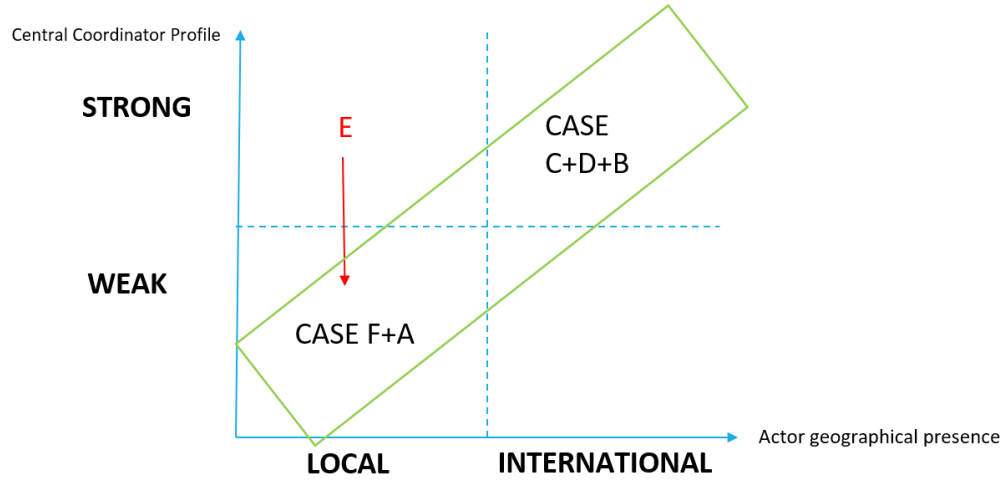

Figure 6.18: Central Coordinator Profile - Geographical presence

The main pattern that can be identified from the map (Figure 6.18) is related to the presence of cases in the two respective quadrants, in two situations:

> Insight (6): **The central coordinator profile changes according to its geographical presence, two situations are identified:**
>
> **Situation 1:** When the central coordinator is **local**, there is a **weak** central coordinator in the collaboration.
>
> **Situation 2:** When the central coordinator is **international**, there is a strong central coordinator in the collaboration.

The insight is justified by the cases available in the map (Figure 6.18).

A possible suggestion could be related to the fact that no cases are present in the other quadrants, apart from Case E (but as explained above it seems that the configuration of the central coordinator profile is the wrong one), and that maybe the only possible situations are the situation 1 and situation 2.

Suggestion (5): **The only possible configurations of central coordinator profile and geographical presence are the Situation 1** (local and weak central coordinator) **and Situation 2** (international and a strong central coordinator)

The suggestion could be reasonable from a logical perspective: generally, the international organisations are strongly structured and with standardized processes. They are used to a precise way of working; they want to respect donor restrictions and they want to have the full control on the decisions. It seems not possible a weak profile respecting these conditions, where shared decision making, and resource management would be implemented. On the other hand, the local organisations are generally characterized by a lack of resources, funds and often leadership capabilities. This is the reason why it seems more reasonable the presence of a weak central coordinator: everyone can bring its own contribution to the collaboration (in terms of resources, command, etc).

However, no literature is available to confirm it. The only author that could be linked is Balcik et al. (2010): they report that the umbrella organisation (a sort of central coordinator for the horizontal coordination) is often international but can sometimes be a local agency. But in both the cases it is not assured the successful: in the case of local agency the problem was related to a lack of leadership (the NGOs do not report to the umbrella) and capacity. In addition, no differences in terms of profile are available.

6.2.4 Agreements presence

Regarding the presence of agreement, it is highlighted as a critical factor in the case A and B.

This is the reason why it could be interesting to investigate better the insights and the patterns across the cases related to this dimension. In the next sections are described some patterns identified about the functions of the agreements and the relation with the trust dimension.

1.Data about the agreement

The first step is the comparison of the agreements' presence in the different cases: as reported in the findings (5.2 Findings) it is not possible to retrieve the complete set of information about the agreement established in the different cases. The characteristics available are summarized in the table below (Table 6.15: Agreements' features).

The information retrieved about the agreements can be summarized in three columns:

1. *Presence of agreement*: if the agreements are present in the project (**YES**) or not (**NO**). If the data are available it is reported also which actors have signed the agreement.
2. *Usefulness of agreement*: if the agreement presence seems useful in the collaboration or in the specific relation (**YES**) or (**NO**).
3. *Content of the agreement*: what is established in the agreement

Case code	Agreement presence	Usefulness of agreement	Content of the agreement
A	**YES**: all the relations are regulated by agreements	**YES**: share understanding of the objective, for the "*actual work to be done*", not to build relationship behind, establish the rules of the relation (deadlines, donor restrictions, deliverables, etc)	NGO_{A1} - Local partners: KPIs and deadlines, roles and responsibilities, shared understanding, time span, deliverables, data disclosure policies, donor restrictions
B	**YES**: all the relations have agreements	**YES**: share understanding of the objective, for the "*actual work to be done*", establish the rules of the relation (deadlines, donor restrictions, deliverable, etc)	Non-profit $organization_{B1}$ – local partners: KPIs and deadlines, roles and responsibilities, decision-making, time span
C	**YES**: between NGO_{C1} - LSPs	No available data	KPIs and time span *ASSUMPTION 1: prices agreed and roles and responsibility*
D	**YES**: between NGO_{D1} - LSPs	No available data	KPIs and no other information *ASSUMPTION 2: prices agreed and roles and responsibility and time span*
E	**YES**: all the relations are regulated by agreements	**YES**: NGO_{E3} - private useful for commercial specification **NO**: NGO_{E3} - LNGOs not useful to regulate the pooling of resources because they are "*scared*"	NGO_{E3} - Private: commercial specification (prices and timelines) NGO_{E3} - LNGOs: shared understanding, no roles and responsibilities, pre-financing
F	**NO**	No available data	
G	**YES**: between NGO_{G1} - donor	No available data	NGO_{G1} - Donor: objectives, KPIs, fundings, bound ways of working,

Table 6.15: Agreements' features

Assumptions in the Table 6.15

1), 2) The assumption in the case C and D about the content of the contracts is justified by the type of relation $NGO_{C1\text{-}D1}$ have with the LSPs. It is an outsourcing relation, so it could be assumed that also the agreements are similar to the contract that regulate the outsourcing relations in the commercial market.

2. Patterns in the data

Observing the "*usefulness of the agreement*" and the "*content of the agreement"* of Table 6.15: Agreements' features it is possible to observe that the main functions of the agreements identified by the respondents and actually used in the cases are recurrent. In particular, they are:

Insight (7): **the agreements can have four main functions that are**

5. *Define common and/or individual objectives and how to measure the achievement of them*
6. *Define the reciprocal roles and responsibilities*
7. *Define the scope of the relation (e.g. time span, resources involved, information shared)*

8. *Define contingent rules about the commercial transactions (e.g. commercial specifications, prices, quantities)*

The Table 6.16 describes how these functions have been implemented in the cases:

Case code	Define objectives	Define the roles and responsibilities	Define the scope	Define contingent rules
A	shared understanding, KPIs	roles and responsibilities	Deadlines, disclosure policies	Deliverables, donor restrictions
B	KPIs	roles and responsibilities, decision-making	Deadlines, time span	Deliverables, donor restrictions
C	KPIs	*roles and responsibility*	time span	*prices agreed*
D	KPIs	*roles and responsibility*	time span	*prices agreed*
E	shared understanding		pre-financing	commercial specification
G	objectives, KPIs		fundings, bound ways of working	

Table 6.16:implementations of the functions of the agreements

In the literature rarely there are evidences about the agreements used and neither about the content of these agreements; however, the data provided seem to prove the insight (7) identified:

1. *Define common and/or individual objectives and how to measure the achievement of them*: no evidences of this function emerge from the literature.
2. *Define the reciprocal roles and responsibilities:* the contract used in Ya'na center aims to establish supervision and responsibilities to manage the stakeholders more efficiently (Xu et al., 2018).
3. *Define the scope of the relation (e.g. time span, resources involved, information shared):* Rodriguez-Espindola (2018) asserts that establish agreements regarding information sharing, obligations and resources available beforehand can be beneficial for activities in the field when the disaster strikes. They could be useful also to define the activities of the partnership (Martin et al., 2016)
4. *Define contingent rules about the commercial transactions (e.g. commercial specifications, prices, quantities,):* in the collaboration between HOs and LSPs commercial logistics contracts are used (Vega, 2015).

Furthermore, it is possible to observe that in the majority of the collaboration projects (excluding the case F) the partners use the agreements and they are considered useful by the practitioners. However, it is not possible to generalize this insight for all the cases and a question arises: why, in the project F, does the collaboration work even without the usage of the agreements?

To answer this question relations with other dimensions are investigated and the trust presence reveals some interesting patterns.

This analysis is built on the same assumption of 6.2.3- 2. Patterns in the data paragraph: the previous relations among the actors are, in these cases, what create trust. The trust can be a stronger and more generalizable enabler that is probably what can really enhance the collaboration.

It can assume two values:

- **Strong trust:** if there are previous relations and it is quite immediate the presence of trust.
- **Weak trust**: if there are not previous relations and consequently the creation of trust can be established only when the collaboration starts.

In this case the easier way to identify the patterns seems to map the cases based on two axes (Figure 6.19: Relation trust- formalization): the level of formalization **YES** if it is formalized, **NO** if it isn't formalized and the level of trust (strong trust and weak trust).

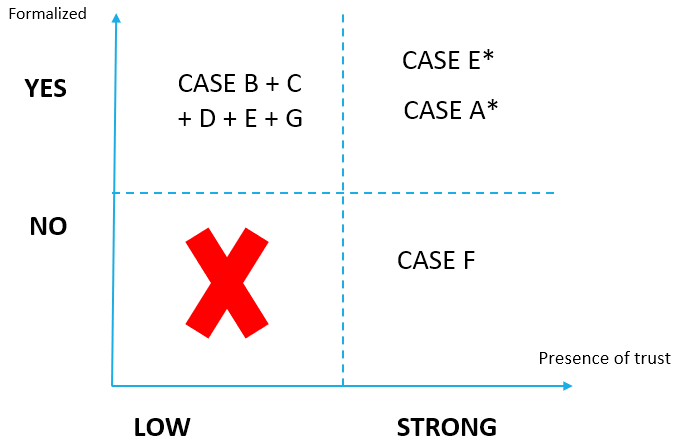

Figure 6.19: Relation trust- formalization

The comparison with trust allows to make some reflection about the use of agreements.

It is possible to work without agreements because the functions 1. 2. 3. of the agreements identified above are compensated by the trust because:

1. The partners are strongly committed towards the common objective of the project and not towards individual one. For this reason, they do not have to establish individual metrics and deliverables because they trust that each partner will do its best to reach the common objective. In particular, in case F the partners were all committed to help the local community.
2. It is not necessary to ensure roles and responsibilities writing them in a formal agreement but they could be defined only verbally and they trust the partners will respect them. In the case F the roles and responsibilities emerged over the time to answer to a coordination issue not to bound the limit the space of action of the partner
3. All the actors share the resources available with the other partners without signing a written agreement because they are aware that the other partners are using these resources to answer to the common needs without exploiting them for their personal objectives. In the case F the private sectors share its resources without signing agreements.

However, trust cannot compensate the fourth function of the contracts identified because it doesn't compensate the contingent rules about commercial transactions.

Suggestion (6): **it is necessary either the presence of trust or the presence of agreements to collaborate**

From the literature some authors support this suggestion even if maybe the perspective is slightly different.

For example, Falagara Sigala & Wakolbinger (2019) mention the necessity to use contract between small NGOs and LSPs to establish short term relationships because in absence of a real relation the collaboration can be based just on agreements.

In addition, Heaslip (2012) states that an agreement should always be set, and it can be either based on the trust or written. This could be seen as another way to assert that either trust or agreements are necessary to collaborate. However, Stephenson (2005) has an opposite view: he states that if the collaboration among the actors must be secured by a contract it means that the collaboration itself is weak. "*As for commitment based trust, if a coordinator must rely on "the contract" to secure cooperation and coordination it seems likely that matters between the organizations involved have already descended to a difficult place".*

Maybe these contrasts could be clarified pinpointing a further specification:

Suggestion (7): **having an agreement even in the presence of trust is better because it is clearer the definition and because it enables to specify the contingent information.**

The case A* an E* are particularly significant to this suggestion. In case A the agreements are important about the definition of the operative work, but they are considered useless to build the relationship. It is an interesting aspect that could be further developed. A similar case is the relation between the NGOs and PS_{E1} in the case E: they know each other so it is possible to hypothesize that there is trust among the partners. Nonetheless, in this case it is necessary to use the agreements because they pre-finance the stocks, so the agreements are needed also to regulate these financial transactions.

The literature supports this view: many authors suggest the importance to set institutional constraints because they can enhance mutual trust and to rationalize the inter-organisational relationships setting institutional constraints (Lu & Xu, 2015). However, it seems important to set these agreements in the preparation phase to clarify regarding information sharing, obligations and resources before the phenomenon strikes (Rodríguez-Espíndola, Albores, & Brewster 2018).

6.2.5 Synthesis

In Table 6.17: Synthesis table cross-case analysis is reported the suggestion and insights identified for each CCF:

CCF	Insights	Suggestions
Private sector presence	Insight (1): the presence of the private sector always positively influences the outcomes of the collaboration	Suggestion (1): The collaboration with the private sector is successful when its involvement is a win-win relationship
	Insight (2): When the private sector is involved the relation can be at two level, operational or strategical.	
Government presence	Insight (3): The government is always responsible to approve the project, but it is responsible to coordinate the actors if it has a structure dedicated to serve the aim of the project and it is an adequate structure.	Suggestion (2): The presence of the government is critical when it has an active role in the collaboration
Central Coordinator	Insight (4): When there is a central coordinator in the collaboration it can assumes two types of profiles, weak or strong.	Suggestion (3): The central coordinator presence is critical when it is a strong central coordinator.
	Insight (5): The central coordinator profile changes according to the trust's level, two situations are identified: Situation 1: When there is a strong trust due to previous relations, there is a weak central coordinator in the collaboration. Situation 2: When there is a weak trust due to previous relations, there is a a strong central coordinator in the collaboration.	Suggestion (4): The only possible configurations of central coordinator profile and level of trust are the Situation 1 (strong trust and weak central coordinator) and Situation 2 (weak trust and a strong central coordinator)
	Insight (6): The central coordinator profile changes according to its geographical presence, two situations are identified: Situation 1: When the central coordinator is local, there is a weak central coordinator in the collaboration. Situation 2: When the central coordinator is international, there is a strong central coordinator in the collaboration.	Suggestion (5): The only possible configurations of central coordinator profile and geographical presence are the Situation 1 (local and weak central coordinator) and Situation 2 (international and a strong central coordinator)

Agreements	Insight (7): the agreements can have four main functions that are: 1. Define common and/or individual objectives and how to measure the achievement of them 2.Define the reciprocal roles and responsibilities 3.Define the scope of the relation (time span, resources involved, information shared, etc) 4.Define contingent rules about the commercial transactions (commercial specifications, prices, quantities, etc)	Suggestion (6): it is necessary either the presence of trust or the presence of agreements to collaborate Suggestion (7): having an agreement even in the presence of trust is better because it is clearer the definition and because it enables to specify the contingent information.

Table 6.17: Synthesis table cross-case analysis

7. Conclusion and Limitation

As described in Introduction, the research project aims to explore the cross-sector collaboration in the Humanitarian Supply Chain field. The field investigated concerns the collaboration between actors of the humanitarian, private and public sector. In particular the thesis addresses three research questions: the identification of the typical collaboration's elements, the ones that can be considered critical and the identification of patterns among these elements.

In order to answer to the first question a systematic literature review is performed (Systematic literature review on collaboration practices in the HSC) and a framework with collaborative dimensions is built. While, the two other questions are addressed based on seven case studies: the data are retrieved from six semi-structured interviews with practitioners who have been involved in cross-sector collaborative humanitarian projects. Details on the projects, or case studies, are available in the 5.1 Data collection. All the data from these cases are classified based on the collaboration dimensions identified as relevant from the literature (*findings framework*) and then two analysis are performed (Analysis and discussion).

The results obtained are obviously qualitative: firstly, from the analysis of each case some elements of the collaboration are identified collaboration critical factor (CCF). They are elements that can strongly influence many other dimensions of the collaboration (6.1 Within-case Analysis:). Secondly, comparing all the cases, some patterns are identified among the elements more relevant, the ones defined as critical. General insights and suggestions are concluded and then briefly summarised in the paragraph Synthesis . They are related to four main elements. Firstly, the presence of the private sector: it is an actor that can add value and positively influence the collaboration when it is in a win-win collaboration; the government who can have an active role and of coordinating body. Thirdly the central coordinator mechanism is deeply studied: its criticality, its features and profiles (defined as strong and weak) and the comparison of its presence when there is trust and international or local actors. Finally, the main functions of agreement are classified and the presence of trust or the agreement itself defined as necessary elements for the collaboration.

7.1 Research Implications

The innovative contribution of this research is the attempt to explore with a complete overview the cross-sector collaboration phenomenon including all its typical elements.

A first contribution is the fact that well defined dimensions are used to collect the data for both the literature and the empirical part. Indeed, often in the literature the terms and dimensions used are not clearly defined, a part from topic specific papers (John, Gurumurthy, Soni, & Jain, 2018; Martin, Nolte, & Vitolo, 2016; Uddin & Hossain, 2011) or the paper of Nurmala, de Vries, & de

Leeuw, (2018) and Falagara Sigala & Wakolbinger, (2019); creating confusion for the successive research and the comparison with other papers. A risk that is even higher when qualitative and interviews techniques are used.

Secondly the critical factors identified in the within analysis are an innovative part: just few authors quote the presence of specific critical factor in the HSC (Pettit et alt.,2009; Pettit et al.,2006) and even less in the collaboration topic(Akhtar, Marr, & Garnevska, 2012; Moshtari & Gonçalves, 2017). Especially they do not clearly define what can be a critical factor and they do not search among all the elements of the collaboration. Our approach is innovative because the attempt is not focus a priori on a specific element, identifying in some ways that this element is the critical one before the data collection, but it deduces the CCFs from the reality.

Thirdly the identification of insights and suggestions comparing different cases of different disasters, is not strongly used, excluding few cases (Bealt, Fernández Barrera, & Mansouri, 2016; Clarke & Campbell, 2018; Dubey, Altay, & Blome, 2017; Falagara Sigala & Wakolbinger, 2019; Nolte & Boenigk, 2011; Nurmala et al., 2018; Prasanna & Haavisto, 2018). Indeed, often the scholars identify their suggestions relating to a specific case study due to its specificities. This motivation leads to a limitation of our cross-case analysis; however, the presence of common patterns among so different situations can be a starting point for deducing suggestions that could be independent from the context. It is evident the lack of this approach on the coordination mechanisms dimensions: many results from the literature about this dimension are specific to the case studies and not general apart from the attempt of Balcik et alt. (2010).

In addition, the part of the Systematic Literature Review is also an important contribution. Few authors, at least in the sample analysed, perform a SLR on specific collaboration topics (Falagara Sigala & Wakolbinger, 2019; Heaslip & Barber, 2014), and only three authors on the cross-sector collaboration (Kovács & Spens, 2007; Nurmala, de Leeuw, & Dullaert, 2017; Steigenberger, 2016). For this reason, even if with some limitations, the systematic approach is a step to give a general and systematic overview on the topic.

Finally, it should be reminded that the topic itself (the cross-sector collaboration in the HSC) is characterized by a low maturity (Naor, Dey, Goldstein, & Rosen, 2018; Nurmala et al., 2017, 2018) and this thesis can contribute to add a small piece on the development of this research area.

Furthermore, at the end of the SLR the discussion in the 4.5.2 Discussion on literature review permits to highlight some literature gaps. The thesis covers some of them:

- Needs of more evidences about the features of the actors involved and the role they play in the SC: thanks to the insights and suggestion on the private sector and the government presence.
- Need of further research about which variables affect the level of the collaboration: it is addressed through the insight (2). Here the level of private sector relations is expressed in function of some specific variables (coordination mechanisms-decision making, resource sharing, information sharing).

- No analysis focused on the use of the contracts and research to generalize which agreement in which case: firstly, the thesis focuses a part of the analysis also on the institutionalization dimension. In addition, the classification of the main four functions adds many aspects to this gap. Finally, also the relation with the trust presence is a starting point for answering to the identification of which case requires which agreements.
- Further, this research investigates which situations require which types of mechanisms (Nurmala et al., 2017): all the results from the analysis of the central coordinator presence address this gap. Especially the last two insights and possible suggestions on the relation with the trust and the local/international level are a beginning to specifically identified the coordination mechanism more suitable to each context.

7.2 Practical implications

The humanitarian supply chain research starts from the practitioners' need to improve their work in the humanitarian relief. Therefore, at the end of this research project, a question arises spontaneously: how can the results described in the previous chapters enhance the humanitarian supply chains on the field?

This research can be useful because it highlights some critical and not obvious aspects that could be neglected or underestimated by the practitioners. Often, they just consider their personal experience insights and lessons learnt or because these elements are not taken into account in the natural mindset of the people on the field. For these reasons, the suggestions formulated could be used by the practitioners as a checklist to have a more complete overview when they evaluate their collaboration projects or when they implement a new one.

In particular, the checklist consists of some recommendations to the practitioners briefly stated in this section.

- **Involvement of actors:** Check to have the approval of the government before starting the project. If the government is an active player, pay attention and deal with its initiatives. In particular, if it exists a governmental structure dedicated to serve the aim of the project, the government may have a coordination role.
- **Involvement of private sector:** If the collaboration project lacks resources and expertise check if it is possible to involve the private sector in a win-win relation to improve the outcomes of the collaboration. Check if the involvement in the decision making of the private sector is coherent with the contribution it brings to the relation (expertise if it is part of the decision process or just resources otherwise).
- **Central coordinator:** Check the presence of a central coordinator, and if its profile is coherent to the other project dimensions. In particular if there is no trust among the actors and the central coordinator is an international player, the central coordinator should centralize the information and resource management, select the actor, the objectives, the metrics to measure them and be the responsible of the decision making. If the partners trust each other and the central coordinator is a local player, the central coordinator may have a democratic approach involving

the other actors in the decision-making and in the management of the resources, not being the only responsible of the selection of the other actors and of the individual objectives and metrics of them.

- **Agreement**: Sign agreements to establish the contingent information about the collaboration relation. If the partners do not trust each other it is necessary to define in the agreement also the individual and common objectives, the roles and responsibilities and set the boundaries of the relation (e.g. duration, resources involved, information shared).

7.3 Study limitations

To avoid inaccurate generalization and damage of the research's results it is important to remark and precise the intrinsic limitations of it. These are attributed to two main causes: the methodology choice and the sample selection.

7.3.1 Methodological limitations

Each research method is more suitable to a precise type of research and results, but it has its own intrinsic limitations which are investigated in the following section.

Systematic literature review

Explore the literature in a systematic way allows to aggregate the content of the previous researches according to transversal topics. Nonetheless, extrapolate from the context of the papers could determine an inaccurate generalization of the concepts. Indeed, in the humanitarian field practitioners and researchers do not use a univocal terminology; sometimes concepts that have the same name are aggregated and compared but maybe the same terms could refer to slightly different situations or meanings.

Semi-structured interviews

This interview's approach, on one hand lets the respondent free enough to give information and to identify the connections among the elements of the collaboration; on the other hand, it does not explore the case in a standardize way because not exactly the same questions are addressed to the respondents during all the interview. This is the reason why sometimes the answers of the respondents are not completed, and the findings miss the data about some dimensions. In addition, the protocol of the interview has slightly changed from one interview to another. In particular, the relationship dynamics has been explicitly asked only after the second interview.

Analysis

- The research identifies dimensions to study the collaboration in a more structured way. The analysis is based on the distinctions of these dimensions. However, sometimes the configuration of a single element could be included in the study of many dimensions (e.g. the responsibility of decision-making is a central element of the *Coordination mechanisms and decision-making dimension* and of the *relationship dynamics*). These overlapping may cause inconsistencies in the analysis: firstly, because the data about the case-element analyzed (step 1 of the cross-case analysis) could be retrieved in different findings dimensions; secondly because some

dimensions' definition are correlated and this could determine the identification of "*false*" patterns among them. Nonetheless, the overlapping of the dimensions is unavoidable because they describe real situations and is not possible to univocally classify all the elements. Maybe this issue could be mitigated aggregating some dimensions and decreasing their number.

- Another important limitation is linked to the restriction of the scope in the within analysis: five dimensions are mainly analyzed. This is a significant restriction, nonetheless this research could not investigate all the possible patterns of the field but can be the starting point of this exploration.
- In addition, the cross-case analysis also restricted the scope identifying the relevant patterns just among the critical case-elements. However also in this case the scope restriction is necessary to focus the attention on specific element and can be the starting point of other exploration.
- In addition, the analysis is based on some data which have been reasonably assumed because the findings miss them.

7.3.2 Sample limitations:

The validity of the results of the research is influenced also by the criteria used to select the literature sample considered in the systematic literature review and of the case studies.

Systematic literature review sample:

- **Choice of literature database**: The sample is selected among the papers available on the Scopus database. This excluded the contribution of the papers not available on this engine.
- **Papers analyzed selection criteria**: some criteria are applied to select the papers analyzed. The choice of the criteria is supported by the reasons described (4.1 Literature search methodology), nonetheless it is an arbitrary choice which risks excluding papers valuable for the research. The selection of the journals is the most critical because it just included the contribution of the papers published on established journals.

Case studies sources

The findings of the case studies are built crossing different sources: the interviews, other primary data from the company interviewed and secondary data. The sources used could bias the perspective of the case and affect which are the contents retrieved. In this regard, here are presented the main issues of this research:

- **Interviews**: The answers provided by the respondents could be biased by their different perspectives due to their managerial role, the nature of their organization and their background. As a result, the different respondents tend to focus on different data. It is critical because sometimes it is necessary to interpret the data according to the respondent view perspective before comparing them. This is certainly true in the case C/D and G because the respondents are employed in the logistic units so they have an operational perspective of the cases, they are used to solve and study the issues on the field; while, in the case F the interviewee lacks of this view because he is the CEO of a chamber of private companies so he deals more with strategic and diplomatic issues. In the same way, in the case A/B the respondents of $NGO_{A/B1}$ have a similar managerial perspective, nonetheless their view is integrated by an additional interview

of a member of a small local company; In the case E the perspective is biased by the organization of the respondent: only this case, and the case F, provides the for-profit perspective of the HSC. This subjective view of the cases could be overcame consulting more respondent per case. Unfortunately, in this research it was possible just in case A.

- **Primary and secondary sources**: Another way to mitigate the bias perspective is the integration of the primary and secondary sources; however, it is not always possible to retrieve primary and secondary sources. In particular, Case E does not have primary or secondary sources; Case C and D have been studied just from primary sources (the interview and sources provided by $UN_{C/D1}$ itself, not other partners reports are available); in addition, the data of Case C are retrieved from reports that aggregate information about the actions of $UN_{C/D1}$ in the country not just to project C.

Case studies sample

- Another category of limitations to be underlined are related to the selection of the case studied. The aim of this research is to explore the cross-sector collaboration; however, the sample of cases analyzed is limited: it does not include any case which explore the perspective of the militaries or of the government.
- In addition, in this research, the analysis of seven cases has led to the general suggestions and insights. Obviously, the results achieved should be validated by many other cases to be considered incontrovertible truth.

7.4 Future research directions

Considering the limitations described and the results achieved, valuable topics to be further studied are identified.

The identification of the critical elements of the collaborations and the investigation of the patterns aims to be a small contribution to a bigger picture: the exploration, structure and mapping of all the elements and the relations of the collaboration in the humanitarian field. In this sense, this thesis could inspire the future researches.

Specifically, some directions are identified and described below in this section.

The researchers could integrate the study of the CCFs of the collaboration with new insights about the effect of the CCFs themselves on the outcomes. This linkage could highlight in which situation these Critical collaboration factors could be considered critical collaboration success factors (CCSFs).

Another direction for the future research may be to further investigate and develop the insights about the analyzed dimensions:

To what concerns the institutionalization, it is not enough the identification of the agreement's functions, it should be integrated by criteria to match the most suitable agreement to the different situations, as it has been highlighted in the literature review.

A further analysis could investigate how better exploit the possible synergies between the private sector and humanitarians studying a cultural perspective. Indeed, a resistance to change seems one of the major challenges for this integration.

Another direction inspired by this thesis could be the investigation of other coordination mechanisms (excluding the central coordinator) to identify in which situation is better to use each of them. This contribution could be innovative and valuable also for the business sector which commonly recognizes the ability of the humanitarians to coordinate a high number of different players (Day, 2012).

In addition, it is possible to follow our research patterns and try to confirm or modify the results achieved (CCFs, insights and suggestions) comparing it with further case studies. Especially it seems particularly significative to include the militaries and governmental perspective for an objective view of all the aspects of the cross-sector collaboration. The inclusion of the government point of view seems particularly significative because our results closely involve this actor.

8. Afterword: COVID-19 emergency

While we were approaching the conclusion of our research, our life and the entire globe have been shocked by the Corona virus outbreak: "*the global health crisis of our time*" (WHO, 2020).

We immediately perceive this huge challenge as strictly connected to our thesis. While studying the topic of the disaster's relief through defined case studies and theories, the reality has shown us an unexpected "*case study*": a sudden and new emergency that is investing the entire world and it is changing the everyday life.

As this health crisis has a disaster size disproportionate to our expectations, also the results of our research could potentially have a greater impact: they could be relevant not only in the operations for humanitarian aid in developing countries, but they could interest also the response to the virus.

Therefore, we will report some simple thoughts to reflect the contributions of our thesis on the COVID-emergency.

Need of cross-sector collaboration: First in this crisis it emerges dramatically, more than ever, the necessity of collaborate within the nation and across nations, but also across sectors: *governments, business, finance, science, and society*. The response to this crisis requires a "*whole of government, whole of society response*" [16] (general director of the World Health Organization). The collaboration is needed to obtain the resources not only to respond to the health crisis but also to diminish the economic shock and the facilitate the recovery. OCSE asks the international coordination on four aspects: governments, central banks, common politics and establish trust (OCSE,2020).

Need of a central coordinator and adequate structure: in this emergency situation, it seems necessary a strong central entity who has the authority to coordinate the different parties involved.

The governments are emerging in this role coordinating the governmental structure of "*civil defense*" and health system. The major concern regards the nations with not adequate and established structure, how can they respond to this? and how can the nations with non-public health structure face the saving of so many lives?

These are just some simple reflections; they could be a simple food for thought to start the development of new research with small additional piece of awareness.

16 https://www.barrons.com/articles/a-message-to-the-g20-end-the-shocking-lack-of-multilateralism-51584969582

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10. Appendix

Appendix 1: Interview protocol

1. RESPONDENT

1. What are your experiences in the humanitarian logistics?

2. GENERAL COLLABORATIONS

1. What is your collaboration strategy?

3. COLLABORATION CASE STUDY

1. Motivations
   - 1.1. Why have you decided to collaborate?
   - 1.2. Have the motivations been modified along the different disaster phases?
   - 1.3. Have the motivations been achieved?
   - 1.4. (if the collaboration has ended) Why has the collaboration ended?
2. Actors and partner selection
   - 2.1. How many partners do you have in this collaboration?
   - 2.2. Who was involved in the collaboration?
   - 2.3. Which were the roles of each actor involved in the HSC?
   - 2.4. Who was the initiator of the collaboration?
   - 2.5. How have you selected your partners? What are the main criteria for select the partner along the different disaster phases (if you have some)?
   - 2.6. How do you evaluate the performances of your partners before the selection?
   - 2.7. Were you aware of the existence of your partner? Have you already collaborated with your partner?
   - 2.8. Have you performed a cost/benefit analysis before entering in the collaboration?
3. Time horizon
   - 3.1. What is the lasting of this collaboration? (long term, medium term, short term)
4. Institutionalization and decision making
   - 4.1. Has the collaboration been formalized? (contract, informal agreement…)
   - 4.2. Are the contract or a formal agreement useful in the relationship?
   - 4.3. Who was responsible of decision making and of the control? (joint or individual) Have they changed along the phases?
   - 4.4. Was there a central coordinator?
5. Relationship dynamics
   - 5.1. Was the collaboration balanced among the partners? Do you have same influence and bargaining power on common objectives and decisions?

6. Collaboration activities
    6.1. Which are the supply chain activities across the different phases?
    6.2. Who was the responsible of each activity?
    6.3. Were there some standard procedures during the activities' implementation?
    6.4. Has the collaboration enabled each of these activities?
7. Resources
    7.1. Which resources (human capital, knowledge, financial, technology, experience, asset - infrastructure, space, fleet, goods…-) have you shared performing the activities? How have shared them?
8. Information and coordination mechanisms
    8.1. Which types of information have you gained during the collaboration? (data about the disaster, the population affected, location, needs…)
    8.2. Which type of information do you share among you? If yes, how?
    8.3. In which language do you communicate?
    8.4. Which tools do you use to communicate each other? (mail, phone calls, platforms…)
    8.5. Do you have some coordination mechanisms? (meetings, joint teams…)
9. Outcomes and evaluation
    9.1. Which are the most relevant and successful outcomes?
    9.2. Which were the costs of the collaboration? Have you shared them?
    9.3. Have you measured the successful outcomes? How? Have you used standard performance metrics?
    9.4. Have you measured the performances of your partners after the collaboration? How? Have you used standard performance metrics?
    9.5. Have you performed a cost/benefit analysis after the collaboration? Which were the main results?
    9.6. Have you performed a supply chain risk assessment? How do you relate it with the collaboration?
10. Drivers and challenges
    10.1. What elements do you think have enhanced the performance of the collaboration?[17]
    10.2. Which challenges do you have to face?
    10.3. Do you collaborate with private sector? Is the profit aim a reason for conflict?
11. Lessons learnt and future perspectives
    11.1. Are there lessons learnt of the collaboration? Which are?
    11.2. Which further developments are planned?
    11.3. In which occasions have you collaborated with other NGOs

12. Further questions

12.1. Were you active in the impacted region before the disaster? And before the collaboration?

12.2. Were your partners active in the impacted region before the disaster? And before the collaboration?

Appendix 2: SLR paper sample

Author	Title	Year	Source
Xu J., Xu D., Lu Y., Wang Q.	A bridged government–NGOs relationship in post-earthquake reconstruction: the Ya'an service center in Lushan earthquake	2018	Natural Hazards
David Swanson R., Smith R.J.	A path to a public-private partnership: Commercial logistics concepts applied to disaster response	2013	Journal of Business Logistics
Naor M., Dey A., Goldstein S.M., Rosen Y.	Civilian-military pooling of health care resources in haiti: A theory of complementarities perspective	2018	International Journal of Production Research
Prasanna S.R., Haavisto I.	Collaboration in humanitarian supply chains: an organisational culture framework	2018	International Journal of Production Research
Bealt J., Fernández Barrera J.C., Mansouri S.A.	Collaborative relationships between logistics service providers and humanitarian organizations during disaster relief operations	2016	Journal of Humanitarian Logistics and Supply Chain Management
Scholtens A.	Controlled collaboration in disaster and crisis management in the Netherlands, history and practice of an overestimated and underestimated concept	2008	Journal of Contingencies and Crisis Management
Akhtar P., Marr N.E., Garnevska E.V.	Coordination in humanitarian relief chains: chain coordinators	2012	Journal of Humanitarian Logistics and Supply Chain Management
Balcik B., Beamon B.M., Krejci C.C., Muramatsu K.M.,	Coordination in humanitarian relief chains: Practices, challenges and opportunities	2010	International Journal of Production Economics
Clarke P.K., Campbell L.	Coordination in theory, coordination in practice: the case of the Clusters	2018	Disasters
Octavia T., Halim C., Widyadana I.G.A., Palit H.	Coordination of humanitarian logistic model plan for natural disaster in east java, Indonesia	2016	International Journal of Supply Chain Management
Wimelius M.E., Engberg J.	Crisis Management through Network Coordination: Experiences of Swedish Civil Defence Directors	2015	Journal of Contingencies and Crisis Management

Nurmala N., de Vries J., de Leeuw S.	Cross-sector humanitarian–business partnerships in managing humanitarian logistics: An empirical verification	2018	International Journal of Production Research
Maon F., Lindgreen A., Vanhamme J.	Developing supply chains in disaster relief operations through cross-sector socially oriented collaborations: A theoretical model	2009	Supply Chain Management
Uddin S., Hossain L.	Disaster coordination preparedness of soft-target organisations	2011	Disasters
Luna E.M.	Disaster mitigation and preparedness: The case of NGOs in the Phillipines	2001	Disasters
Carpenter S., Grünewald F.	Disaster preparedness in a complex urban system: the case of Kathmandu Valley, Nepal	2016	Disasters
Rodríguez-Espíndola O., Albores P., Brewster C.	Disaster preparedness in humanitarian logistics: A collaborative approach for resource management in floods	2018	European Journal of Operational Research
Noori N.S., Weber C.	Dynamics of coordination-clusters in long-term rehabilitation	2016	Journal of Humanitarian Logistics and Supply Chain Management
Heaslip G., Sharif A.M., Althonayan A.	Employing a systems-based perspective to the identification of inter-relationships within humanitarian logistics	2012	International Journal of Production Economics
Vega D., Roussat C.	Humanitarian logistics: The role of logistics service providers	2015	International Journal of Physical Distribution and Logistics Management
Nurmala N., de Leeuw S., Dullaert W.	Humanitarian–business partnerships in managing humanitarian logistics	2017	Supply Chain Management
Adem S.A., Childerhouse P., Egbelakin T., Wang B.	International and local NGO supply chain collaboration: An investigation of the Syrian refugee crises in Jordan	2018	Journal of Humanitarian Logistics and Supply Chain Management
Moore S., Daniel M., Eng E.	International NGOs and the role of network centrality in humanitarian aid operations: A case study of coordination during the 2000 Mozambique floods	2003	Disasters
Stephenson Jr. M.	Making humanitarian relief networks more effective: Operational coordination, trust and sense making	2005	Disasters

Carland C., Goentzel J., Montibeller G.	Modeling the values of private sector agents in multi-echelon humanitarian supply chains	2018	European Journal of Operational Research
John L., Gurumurthy A., Soni G., Jain V.	Modelling the inter-relationship between factors affecting coordination in a humanitarian supply chain: a case of Chennai flood relief	2018	Annals of Operations Research
Lu Y., Xu J.	NGO collaboration in community post-disaster reconstruction: Field research following the 2008 Wenchuan earthquake in China	2015	Disasters
Li C., Zhang F., Cao C., Liu Y., Qu T.	Organizational coordination in sustainable humanitarian supply chain: An evolutionary game approach	2019	Journal of Cleaner Production
Steigenberger N.	Organizing for the Big One: A Review of Case Studies and a Research Agenda for Multi-Agency Disaster Response	2016	Journal of Contingencies and Crisis Management
Falagara Sigala I., Wakolbinger T.	Outsourcing of humanitarian logistics to commercial logistics service providers: An empirical investigation	2019	Journal of Humanitarian Logistics and Supply Chain Management
Coles J., Zhang J., Zhuang J.	Partnership behavior in disaster relief operations: a case study comparison of the responses to the tornado in Joplin, Missouri and Hurricane Sandy along the Jersey Coast	2016	Natural Hazards
Nolte I.M., Boenigk S.	Public-nonprofit partnership performance in a disaster context: The case of Haiti	2011	Public Administration
Thompson W.C.	Success in kashmir: A positive trend in civil-military integration during humanitarian assistance operations	2010	Disasters
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Heaslip G., Barber E.	Using the military in disaster relief: systemising challenges and opportunities	2014	Journal of Humanitarian Logistics and Supply Chain Management

Appendix 3: Sample SLR framework

	Paper Title	Phase	Location	Time	Cause	Size	Speed of	Actors
9	Coordination in humanitarian relief chains: chain coordinators	*(Response)*	**Pakistan-occupied Kashmir**, Indian-occupied Kashmir, and Afghanistan. The worst hit areas were cities of Pakistan-occupied Kashmir. These cities were Muzaffarabad,	October 8, **2005** at 08.50 a.m.	**Earthquake**	In these areas, the main infrastructure including roads, hospitals, schools, armed forces, and police were paralyzed. Some areas of North-West Frontier Province of Pakistan were also badly damaged. According to the newspaper (Jang) and Mulvey et al. (2008), more than **86,000 people died** and **100,000**		international NGOs: **NGO1 umbrella** (Coordination management and financial support, 30 employees) **NGO2** (sanitary and water system, 23 employees) **NGO3** (Food, 20 employees) **NGO4** (Medicines, 15 employees) **NGO5** (Tents, shelters and bedding, 12 employees) an international umbrella organization), a local NGO, and the host government). **NGO6** (Social events organizations, 10 employees) **NGO7** (Food, 8 employees) Local NGO: **NGO7** (Food, 6 employees) **Host government**
10	Coordination in humanitarian relief chains: Practices, challenges and opportunities	*(Preparedness and response)*: This study focuses on pre- and post-disaster coordination in relief chains. I We focus on typical coordination mechanisms observed among the actors in the global relief chain **before and during** the initial **response phase** of disaster response.			our primary focus is on sudden-onset disasters caused by **natural events**.		**Sudden -onset** disasters	**(i)Among international relief actors I** **(ii) Between international relief actors and local relief actors I** **(iii) private sector companies:.** COMMERCIAL (such as the interactions between relief organizations and suppliers of relief items or transportation companies); PHILANTROPIC *(one or multiple companies)*: These interactions may even involve multiple companies joining forces to increase the impact of donations or strategic partnerships *Look at the pic in the Memo for the possible relationships between them.* Of particular interest are the coordination activities of International relief organizations (such as non-governmental organizations **(NGOs)**, the International Federation of Red Cross and Red Crescent Societies **(IFRC)**, the United Nations **(UN)** family agencies), and other **major actors** operating within the global relief chain (such as donors, private sector companies, local governments, militaries, and local relief organizations).
11	Coordination in theory, coordination in practice: the case of the Clusters	Response: the activities required were fairly obvious [...] Cluster strategies and agency activities would tend to be very similar in the first phase of a response.						**Humanitarian country team (HCT)**, composed of the heads of operational agencies and tasked, among other things, with: '[a]greeing on common strategic issues related to humanitarian action in-country' and 'on common policies related to humanitarian action in-country' (IASC, 2009, p. 2). **Humanitarian organizations** (both UN and not UN): The one interviewed were the majority of whom were from the camp coordination and camp management (CCCM), education, food security, health, logistics, nutrition, protection, shelter, and water, sanitation, and hygiene (WASH)**+H3:H19**
	Coordination of humanitarian logistic model plan for natural disaster in east java, Indonesia	response	East Java region, in Pasuruan regency.					**Indonesian National Board for Disaster Management BNPB** will become the center of coordination and director in every phase of disaster. **Military** and police have a role in victims' search and rescue and security control at the site of the disaster. **Public Health Office** is in charge of planning and preparing medical personnel, including logistic and medicine requirement. **Social Office** role is social protection and assistance, including fulfillment of food, clothing, shelter and other emergency needs. **National search and Rescue Agency (BASARNAS)** is assigned to search and rescue the victims.

Appendix 4: Sample findings framework

	TIME HORIZON	INSTITUTIONALIZATION		
	Lasting	Formalized	Usefulness of contracts	Responsible
ZAMBIA		Sometimes we go in and say yes we're doing this, it's very clear from hear too [19:49] , other times we may work under the **memorandum of understanding**. So we have a more use with them ,in Zambia and Tanzania, with the vocational training partners that we're working with and so that sets out the nature of the collaboration. [...] and depending on who we're working with, on what, for how long, and we sell fundings or others funding to peak finance [20:19] and conditions of grant on when we're working with JSI or J-care or NORAD or defeat or USAID often But from the Transaid side if you put a **concept note** together we still want a shared understanding about what does that look like, what's the time period, what are you going to deliver what success criteria. Right. So, you already mentioned about agreements, memorandum of understanding, so sometimes they just other times no or usually have some kind of .. ? CB [22:14] Yeah there always has to be something, yeah. It just depends on what be, what the best instruments, the most appropriate for the different way that we're working with. , have you tried to establish any collaboration with these other NGOs? [...] and we've got a **formal agreement** now to collaborate together, and so it's working really well we're sending some we	And do you think that having a formalized relationship is better in such context. I mean, do have an agreement? CB [22:34] Yeah, **Absolutely**, yeah. Yeah, for everyone **just to have a shared understanding of what, what we're doing.** And I don't, I can't think of really many examples where it's appropriate for an organization to work in a country without a formal mandate to do so. No, I think that the agreement is about shared **understanding with partners**, about what you want to achieve together and to make sure there's no misunderstanding and you can, you know, that, that is where we come from on it but If you are going to accept donor funding, you have to understand what **their conditions** are and, you know, you then don't want to impose a whole separate set of duplicated processes because that confuses people even us [24:22] KW [24:22] even on the perspective of, you know, meeting deadlines and things **oftentimes in**	If if a project consortium has steering groups that meets and talks about any direction then it's always led by how the whole design of the work in the first place would be, you know, what's the **ministry part** and how do we respond to that and regular check the Zambia program that we're talking about originally, now development data, local partners lead vIII [53:17], and they received funding from Canadian government before cut [53:20] we had the lead in our consortium of relief funders and quite relief currently funds Uk based charities; so for us, there's a few success stories that our local partners are now leading that program and so there's been a natural transition of responsibility and no of[53:34] ownership and therefore redefining of the roles of different partners and, but it depends in these very, very large programs where we have a small, very small role, it's very hard for us to have an ability to, you know, to steer the situation
	we've got 10 years of history working there and we fit well in the mandate,	* *memorandum of understanding*	*important + need a timeline + need to be flexible*	*ministry responsible* *Now leaders partners before T*
	MAMAZ 2010 - 2013 *MORE MAMAZ 2014 - 2016*	* *formal agreements*		MAMAZ: The consortium will provide strategic
	MORE MAMAZ: The programme expanded activities of	Madagascar[...] it's five years and then with another five years so that's extremely well defined, this **clear contract**, scope of work every year it's updated and some of our programs work	And do you think that having a formalized relationship is better in such context. I	And then Bil **under the support and approval of the Ministry of Health** and other government