Outsourcing in humanitarian logistics – status quo and future directions

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Abstract

Purpose – Outsourcing of logistics has great importance in disaster relief. Aid agencies spend several billion US dollars every year on logistics services. However, the concept of outsourcing has not been established adequately in literature on humanitarian logistics, leading to a fragmented view of the practice. This paper provides a holistic perspective of the concept by constructing a conceptual framework to analyze both practice and research of outsourcing in humanitarian operations. Based on this analysis, we explore future trends and identify research gaps.

Design/methodology/approach – The paper is based on a structured review of academic literature, a two-round Delphi study with 31 experts from aid agencies and a complementary full-day focus group with twelve experts from aid agencies and logistics service providers.

Findings – The paper systemizes the current practice of outsourcing in humanitarian logistics according to a conceptual framework of five dimensions: subject, object, partner, design and context. In addition, it reveals ten probable developments of the practice over the next years. Finally, it describes eight important research gaps and presents a research agenda for the field.

Research limitations/implications – The literature review considered peer-reviewed academic papers. Practitioner papers could provide additional insights into the practice. Moreover, the Delphi study focused on the perspective of aid agencies. Capturing the views of logistics service providers in more detail would be a valuable addition.

Originality/value – The paper establishes the academic basis for the important practice of outsourcing in humanitarian logistics. It highlights essential research gaps and, thereby, opens up the field for future research.

Keywords Humanitarian logistics, Outsourcing, Service provision, Partnership, Disaster relief, Coordination, Cooperation, Humanitarian supply chain, Structured literature review, Delphi

Paper type Research paper

1. Introduction

The term "outsourcing", derived from the expression "outside resourcing" (Stevenson, 2010), describes the approach of organizations to make use of resources beyond their organizational boundaries. Definitions in logistics literature are very heterogeneous (cf. Razzaque and Sheng (1998), Sanders *et al.* (2007) and Reeves *et al.* (2010)). For the scope of this paper, we refer to

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Lieb *et al.* (1993), who define the term "outsourcing" in the following way: "Firms adopting this approach [outsourcing] employ an outside company to perform some or all of the firm's logistics activities. The arrangement may be narrow in scope (for example, limited to warehouse services only) or broad, encompassing the entire supply chain." Outsourcing can also be understood as the provision of logistics functions as services on some form of contractual basis (Razzaque and Sheng, 1998). It involves strategic, tactical and operational activities, such as make-or-buy decision, provider selection, contract negotiation, outsourcing execution and performance evaluation (Bagchi and Virum, 1996; Gould, 2003; Sink and Langley, 1997).

Outsourcing has great importance in humanitarian logistics. Aid agencies spend several billion US dollars every year on logistics services, and Logistics Service Providers (LSPs) are a crucial part of any disaster relief operation (Binder and Witte, 2007). They are indispensable both at international and field level (Sánchez Gil and McNeil, 2015; Vega and Roussat, 2015; Cozzolino *et al.*, 2017; Baharmand *et al.*, 2017). However, only few organizations perceive their engagements with LSPs successful (Bealt *et al.*, 2016). Often, aid agencies are dissatisfied with the perceived performance and the related costs (Cottam *et al.*, 2004; Schulz, 2009). Outsourcing faces very specific challenges in the humanitarian environment. For example, aid agencies' high staff turnover and unpredictable funding cause issues for building relationships with LSPs (Thomas, 2003; Van Wassenhove, 2006). Likewise, different cultures and working styles cause frictions during the collaboration (Nurmala *et al.*, 2017). The broad use of outsourcing by aid agencies and their reported challenges make outsourcing in humanitarian logistics a very interesting area for academic research.

Nevertheless, and in contrary to the field of commercial logistics (Razzaque and Sheng, 1998), the concept of outsourcing has not been established adequately in academic literature on humanitarian logistics. This becomes obvious when applying the search term "*(humanitarian OR disaster*) AND (logistic* OR "supply chain*") AND outsourc**" to four of the most relevant scientific databases [1]. The search only yields eight relevant results (Dufour *et al.*, 2018; Sánchez Gil and McNeil, 2015; Abidi *et al.*, 2015; Vega and Roussat, 2015; Nagurney *et al.*, 2011; Heaslip *et al.*, 2018; Yao *et al.*, 2018; Gossler *et al.*, 2019b). Not surprisingly, there is a continuous call for more research in this regard (Jahre *et al.*, 2016; Bealt *et al.*, 2016; Hoxtell *et al.*, 2015; Vega and Roussat, 2015; Kovács and Spens, 2011).

At the same time, a considerable number of articles have been published in recent years, which actually investigate the concept of outsourcing in humanitarian logistics, but use different expressions to reference it, for example "partnerships with LSPs", "coordination with LSPs" or "cooperation with LSPs" (Bealt *et al.*, 2016; Balcik *et al.*, 2010; Schulz and Blecken, 2010). While none of these terms is synonymous with "outsourcing", they are often used interchangeably. For example, coordination actually refers to the activity of organizing and aligning participating organizations' actions (Wankmüller and Reiner, 2019). Every outsourcing relationship requires a level of coordination for aligning the partners' actions. However, coordination can also take place in other contexts than outsourcing (Gulati *et al.*, 2012; Moshtari, 2016) and "coordination with LSPs" only describes one specific element of outsourcing. Similarly, partnerships are just one specific way of designing outsourcing engagements. They could also be designed as transactional relationships or integrated service agreements (Hauptmann, 2007). Still, many papers use expressions such as "coordination with LSPs" or "partnerships with LSPs" synonymously to "outsourcing". While this ambiguity in terminology is, in fact, typical for an emerging field such as humanitarian logistics, it constrains the transparency of the field and constitutes a serious obstacle for the field to advance (Tatham and Spens, 2015). Therefore, we deem it important to improve the transparency by answering our first research question: *To which extent and how has academic literature researched outsourcing in humanitarian logistics to date?*

In addition to an ambiguity in terminology, the available literature does not allow a holistic view on the practice of outsourcing in humanitarian logistics. Outsourcing entails four main components (Arnold, 2000). The *subject* is the organization which outsources. The *object* is the activity or bundle of activities which is outsourced. The *partner* is the organization to which the activity is outsourced, and the *design* describes how the inter-organizational arrangement is constructed. Most of the existing papers have focused on individual components. While these papers provide an in-depth understanding of sub-aspects of outsourcing, advancing the research field requires to establish a comprehensive and holistic picture. This motivates our second research question: *What is, according to academic literature, the status quo of outsourcing in humanitarian logistics, considering the four components subject, object, partner and design in a holistic way?*

The humanitarian sector has undergone significant changes in the past decade. Given its current dynamics, it appears very likely that it will equally transform over the next decade. Accordingly, it can be expected that the concept of outsourcing will also experience adjustments in the future. Since the intention of this paper is to lay the ground for future research, we consider it paramount to also explore the potential development of the practice over the coming years. Therefore, our third research question inquires: *How will the practice of outsourcing in humanitarian logistics evolve over the next decade, according to experts from practice?*

The continuous call for more research with respect to outsourcing in humanitarian logistics also entails some specific thematic suggestions. These are rather isolated, however, and do neither take a holistic perspective on the matter of outsourcing nor consider its future development. Therefore, we put an integrated research agenda for the field at the center of our final research question: *What should the priorities for future research on outsourcing in humanitarian logistics be, and which methodologies could be applied?*

In summary, this paper contributes to the development of the research field in two ways. First, it is the first paper to provide a holistic view on the important practice of outsourcing in humanitarian logistics, both on its status quo and on its prospective evolution. Second, it reviews the related academic literature in a structured way, synthesizing scattered knowledge and identifying important research gaps.

The paper is structured as follows. In Section 2, we outline our research design. In Section 3, a structured review of literature follows. Section 4 describes the status quo of outsourcing in humanitarian logistics, and Section 5 outlines potential future developments. In Section 6, we highlight important research gaps and propose a research agenda for the field. We close with a summary in Section 7.

2. Research design

Our research design combines both conceptual and empirical methods. It consists of two main building blocks. First, we performed a structured literature review to investigate the status quo of outsourcing in humanitarian logistics and to assess the state of the related literature, answering the first two research questions. Second, we conducted a two-round Delphi study and a complementary face-to-face focus group to address the third research question and determine the prospective evolution of the practice. Finally, we answer the fourth research question by contrasting the results of the first three research questions with each other. We now describe the structured literature review and the Delphi study in detail.

2.1 Structured literature review

We follow the four-step process for conducting structured and content-based literature reviews as proposed by Seuring *et al.* (2012, 2005) in reference to Mayring (2003). We use a

modified version of the framework by Arnold (2000) as a basic set of analytical categories and apply the framework by Hauptmann (2007) as a second layer for the analysis of the outsourcing design.

To gather the relevant literature on outsourcing in humanitarian logistics, we performed a thorough keyword search in six scientific databases (EBSCO Business Source Premier, Emerald Insight, ScienceDirect, Proquest, Wiley and Web of Science) in November 2019, which cover all major POM and humanitarian journals (Gupta *et al.*, 2016; Vega and Roussat, 2015). As previously discussed, many papers do not use the term "outsourcing" when referring to the concept. To capture these papers, we also included other related terms when searching the databases.

For searching the databases the applied search term consisted of three parts which were connected by Boolean AND operators. The first part was "*Humanitarian* OR Disaster**" to restrict the results to the disaster relief context. The second part was "*Logistic* OR 'Supply Chain**" to limit the results to the logistics and supply chain context. The third part was "*outsourc* OR servic* OR 'make-or-buy' OR 'third-party' OR cooperat* OR coordinat* OR partnership* OR relationship* OR 2PL* OR 3PL* OR 4PL* OR Carrier**" to identify all materials which were related to outsourcing.

The keywords were searched for in the abstracts of articles in EBSCO Business Source Premier, Wiley and Emerald Insight. We used "*Topic*" in Web of Science, "*anywhere but full text*" in Proquest and "*Abstract-Title-Keywords*" in ScienceDirect. We did not constrain the search based on the year of publication, but used only English language articles in peer-reviewed journals.

Given the broad search terms, we identified 1142 unique results. We analyzed the title of each paper and excluded articles which were clearly not relevant (976). Afterwards, we read the abstract of each of the remaining 166 articles and excluded a further 91 results. We only kept articles if they considered outsourcing engagements as defined in Section 1 and if they discussed the matter sufficiently, that is, did not only make single references to it. Finally, we read the full text of the remaining 75 articles and excluded a further 21 papers for the same reasons as above. Consequently, we ended up with a body of literature consisting of 54 articles, which are highlighted by "*" in the list of references.

Only 9 of these 54 papers were found using the search term "*outsourc**". The search term "*servic**" led to the highest amount of papers (27), followed by "*coordinat**" (16), "*cooperat**" (13), "*partnership**" (10), "*relationship**" (8), "*carrier**" (5), "*4PL**" (3), "*3PL**" (1) and "*third-party**" (1). Most of the papers use more than one of these keywords and were found multiple times. Independent of the applied keywords, 34 of the 54 papers have outsourcing as the main research topic. We characterize these articles in further detail in Section 3. Since all 54 papers provide relevant insights with respect to outsourcing, we include all of them in our analysis in Section 4.

2.2 Delphi study and focus group

The Delphi method is an iterative and anonymous technique for facilitating and structuring communication among experts. The goal is to either transform individual opinions into group consensus or identify systematic dissent among experts (Dalkey and Helmer, 1963; Hasson *et al.*, 2000; Rowe and Wright, 2011). While usual surveys are good at asking "what is", Delphi studies excel in investigating "what could or should be" (Hsu and Sandford, 2007). This approach is thus very valuable for the setting of this research.

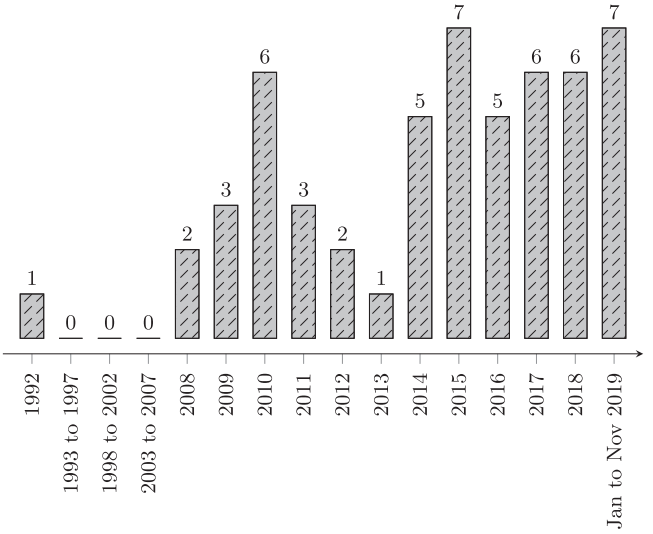
The two-round Delphi study took place between November 2017 and March 2018. It was administered electronically using the Calibrum Surveylet Software and can, consequently, be called e-Delphi (Aengenheyster *et al.*, 2017; Hasson and Keeney, 2011). The first round of the study was a qualitative online survey asking experts to name potential developments with

respect to outsourcing in humanitarian logistics over the next five to ten years. In the second round experts were asked to estimate the likelihood of each of the ten trends identified in the first round. The expert panel consisted of 31 practitioners from 24 humanitarian organizations (HOs), who had on average 13 years of experience in humanitarian logistics, both at headquarters and at field level (see Tables 3 and 4 in Appendix 2). Their high level of experience, their qualifications and their long-lasting exposure to the problem under investigation increase the trustworthiness of our results (Hasson and Keeney, 2011; Lincoln and Guba, 1985). After the finalization of the e-Delphi, in April 2018, we held a complementary full-day focus group with ten experts from HOs and two experts from LSPs. The focus group aimed to deepen the insights from the e-Delphi by debating them face-to-face in controversial and experience-based discussions with selected experts. As a form of member check, it contributes to the credibility of our findings (Wallendorf and Belk, 1989).

For a more detailed description of the Delphi research design please refer to Appendix 1 and especially Gossler *et al.* (2019a). The latter article focuses on the second part of the Delphi study, which investigated best practices for outsourcing and is beyond the scope of this paper.

3. Literature on outsourcing in humanitarian logistics

In this section, we characterize the identified literature on outsourcing in humanitarian logistics. This research is not investigating the concepts of coordination, cooperation or partnerships as such. However, due to the sometimes ambiguous use of these concepts (Wankmüller and Reiner, 2019), this paper assesses journal articles found using such keywords as "coordination" or "partnership", among others, that clearly address outsourcing related content. As illustrated in Figure 1, almost all articles were published after 2008. This development is consistent with the general trend in the academic field of humanitarian logistics, which saw a strong increase in publications after 2005 (Leiras *et al.*, 2014). More than half of the papers on outsourcing have been published since 2015. This illustrates the increasing focus academia is putting on the topic. As shown in Table 1, the Journal of



Source(s): Diagram by authors

Figure 1.
Papers by year

Category	Value	Count
Journal	Journal of Humanitarian Logistics and SCM	13
	International Journal of Production Economics	6
	International Journal of PD and LM	5
	International Journal of Production Research	3
	Production and Operations Management	3
	Annals of Operations Research	2
	European Journal of Operational Research	2
	International Journal of Disaster Risk Reduction	2
	International Journal of Logistics Management	2
	Others (one article each)	18
Contribution	Descriptive	21
	Explanatory	19
	Normative	9
	Exploratory	5
Method[1]	Modeling and simulation	16
	Case study	14
	. . . thereof single case	10
	. . . thereof multiple cases	4
	Structured literature review	8
	Interview/focus group	6
	Survey	3
	Experiment	0
	Other[2]	12

Note(s): [1]Including 5 papers applying more than one method
[2]For example unstructured literature reviews or analysis of practitioner reports

Table 1.
Descriptive statistics on identified papers

Humanitarian Logistics and Supply Chain Management has been the main platform for the matter (13 publications). Eight further journals had more than one relevant publication. Besides this, there are 18 further journals which featured just a single article on outsourcing in humanitarian logistics. This wide spread across journals indicates a fragmented body of literature. With respect to the research contribution (see Yin (1984), Reiner (2005) and Halldórsson and Arlbjørn (2005)), we found that most papers are either descriptive or explanatory. Only a limited number of papers is taking an exploratory or normative approach. The low number of normative papers can be explained with the low maturity of the research field. The relative lack of exploratory research, however, appears surprising against this background. Finally, we use the structures of both Mentzer and Kahn (1995) and Larson and Halldorsson (2004) as a reference for comparing the research methods applied by the papers. We find that surveys are used significantly less than case studies and modeling. This distribution of methods is in line with the general picture in humanitarian logistics literature (Kunz and Reiner, 2012).

In the following, we provide more details on the 34 papers focusing mainly on outsourcing. Comparing the perspective taken by these papers, we find that 11 papers look at the concept from an LSP perspective, nine from a systems perspective, 11 from a HO perspective, one from an inter-organizational perspective, and two from a government perspective. This reflects the relevance of this topic for different stakeholder groups. Classifying the 34 core papers according to the considered service provider shows the following picture: 16 papers investigate commercial LSPs, four the military, six HOs and two retailers. Three papers deal with commercial, humanitarian and military organizations and three articles consider both commercial LSPs and HOs. Thus, the literature shows quite a diverse picture with respect to service providers.

With respect to methodology, 12 of the core papers apply quantitative modelling, nine use case studies, five are conceptual papers, four are literature reviews and four use surveys or interviews. Papers applying quantitative models show a wide variety of specific methods. Bid pricing is a recurrent theme of this literature and is addressed in three publications (Bagchi *et al.*, 2011; Paul and Wang, 2015; Trestrail *et al.*, 2009). Two papers address outsourcing from the perspective of game theory, solving Generalized Nash Equilibria using solution methods for variational inequalities (Gossler *et al.*, 2019b; Nagurney *et al.*, 2019). Auction theory, robust optimization and mixed integer programming are applied in this context. A stylized model is developed in order to analyze the benefits of co-ordination with micro-retailers in last-mile delivery (Sodhi and Tang, 2014). The development and analysis of newsvendor models reveal members' incentives to join the UNHRD network (Toyasaki *et al.*, 2017). One paper applies inventory models to identify optimal quantities for relief commodities (Yao *et al.*, 2018) while others deal with multi-criteria decision making in supplier selection (Kim *et al.*, 2019) or models identifying the optimal design of fixed framework agreements (Wang *et al.*, 2019). Multi-commodity vehicle routing models are employed to show the influence of coordination between government agencies and logistics companies (Wisetjindawat *et al.*, 2014). Different outsourcing strategies are investigated through analytical models (Wang *et al.*, 2016).

Topics addressed by case studies are the role of outsourcing in humanitarian operations (Sánchez Gil and McNeil, 2015), benefits and impediments of horizontal cooperation (Schulz and Blecken, 2010), civil-military cooperation (Hall, 2008; Heaslip *et al.*, 2012), cooperative purchasing of freight forwarding services (Pazirandeh and Herlin, 2014), airflow management capability gaps (Morales and Sandlin, 2015) and the relevance of the 4PL concept for the cluster system (Jensen, 2012). Two case study papers investigate the role of LSPs in outsourcing (Baharmand *et al.*, 2017; Cozzolino *et al.*, 2017), while one focuses on risk management strategies through outsourcing practices (Baharmand *et al.*, 2017). Six case studies consider only one case for their analysis, and three papers review multiple cases. This focus on single case studies limits the generalizability of the insights.

The conceptual papers address topics such as practices, opportunities and challenges of coordination (Balcik and Beamon, 2008), the potential role of a 4PL in humanitarian supply chains (Abidi *et al.*, 2015), possible challenges of relying on contracts with private firms for public goods during disasters (Egan, 2010), as well as pros and cons of using the military in disaster relief (Walker, 1992) and laws and regulations related to the use of US armed forces in humanitarian operations (Silenas *et al.*, 2008).

The four structured literature reviews investigate specific aspects of outsourcing in humanitarian logistics in detail, but do not cover the holistic scope of the article at hand. Heaslip (2013) clusters papers on humanitarian logistics from 15 journals according to their main research topic and identifies a fundamental lack of research on service operations management. Vega and Roussat (2015) apply word frequency analysis, open coding and axial coding to 70 papers from nine journals to identify the role of logistics service providers in humanitarian logistics. The same authors analyze nearly 150 annual reports of HOs to investigate the role of HOs as LSPs (Vega and Roussat, 2019). Nurmala *et al.* (2017) focus on cross-sector partnerships in general and structure the content of 36 articles with regard to context, intervention, mechanism and outcome of such partnerships.

Finally, surveys are used to explore barriers and benefits of collaborative relationships between LSPs and HOs (Bealt *et al.*, 2016) and to build econometric models of transportation tariffs in Ethiopia (Rancourt *et al.*, 2014). Interviews are applied as a methodology as well. These are combined in the case of Heaslip and Kovács (2019), with case studies to provide insights into service triads in humanitarian outsourcing. Falagara Sigala and Wakolbinger (2019) conduct interviews to gain a better understanding of LSP capabilities in different phases of the disaster management cycle.

4. Current state of outsourcing in humanitarian logistics

In this section, we use content-analysis in order to determine how academic literature characterizes the current state of outsourcing in humanitarian logistics. For building a comprehensive and holistic picture, we structure and summarize the literature from the previous section according to the outsourcing framework by Arnold (2000), which has been introduced in Section 1. We complement this framework by a fifth dimension (outsourcing context), taking into account the very diverse operational and environmental conditions of humanitarian operations (HolguínVeras *et al.*, 2012; Van Wassenhove, 2006; Kovács *et al.*, 2009). One illustrative example is the difference between slow-onset and sudden-onset disasters. During slow-onset disasters HOs have sufficient time to build relationships and trust with new service providers and carefully negotiate contracts. In sudden-onset disasters, however, HOs have to either rely on pre-established relationships or set up new engagements in an ad-hoc and rushed manner. We now describe each dimension in detail. Figure 2 summarizes the current state of outsourcing in humanitarian logistics in a holistic framework.

4.1 Outsourcing subject

When it comes to motivation and barriers for outsourcing, apart from some minor specifics, almost the same arguments apply as in commercial logistics (Schulz and Blecken, 2010). With regard to motivation, better performance (Schulz and Blecken, 2010; Morales and Sandlin, 2015; Bealt *et al.*, 2016) and lower cost (Majewski *et al.*, 2010; Schulz and Blecken, 2010; Toyasaki *et al.*, 2017; Kumar *et al.*, 2009; Heaslip *et al.*, 2012) of service providers are most important. But also access to specific capabilities and resources (Bealt *et al.*, 2016; Vaillancourt, 2016; Schulz and Blecken, 2010; Heaslip *et al.*, 2012) and organizational focus on core competencies (Majewski *et al.*, 2010; Bealt *et al.*, 2016) are frequently mentioned. With respect to problems, five major ones can be listed according to Schulz (2009), Bealt *et al.* (2016), Pazirandeh and Herlin (2014), Toyasaki *et al.* (2017) and Nurmala *et al.* (2017): lack of transparency concerning benefits, lack of resources for managing engagement, cultural differences and mistrust, low perceived performance and consideration of logistics as core competency.

Examining the intra-organizational characteristics of HOs, literature indicates that both governmental and non-governmental aid agencies make use of outsourcing, even if non-governmental agencies are more frequently described. Examples of governmental agencies engaged in outsourcing are the US Federal Emergency Management Agency (FEMA) (Dowty and Wallace, 2010) and the US Department of Agriculture (USDA) (Trestrail *et al.*, 2009). Examples of nongovernmental agencies practicing outsourcing are the World Food Programme (WFP) (Schulz, 2009), World Vision International WVI (Vega and Roussat, 2015), the Red Cross (Sánchez Gil and McNeil, 2015), Global Health Ministries (GHM) (Kumar *et al.*, 2009) and many others.

Sánchez Gil and McNeil (2015) and Pazirandeh and Herlin (2014) clearly illustrate that there are differences with respect to how organizations outsource. Many potential reasons for these differences are mentioned in the literature. Besides sectoral affiliation (governmental or non-governmental), size is the most mentioned one (Bealt *et al.*, 2016; Balcik *et al.*, 2010). While both major organizations like WFP (Schulz, 2009) and small agencies like GHM (Kumar *et al.*, 2009) engage in outsourcing, small agencies have specific benefits and concerns. On the one hand, small agencies might benefit more from outsourcing (Pazirandeh and Herlin, 2014; Schulz and Blecken, 2010) and even be dependent on the achievable cost reductions (Majewski *et al.*, 2010). On the other hand, they fear that outsourcing would make it harder to distinguish themselves from other agencies (Vaillancourt, 2016) and could therefore cause competitive disadvantages (Schulz and Blecken, 2010). Besides the size, differences in the

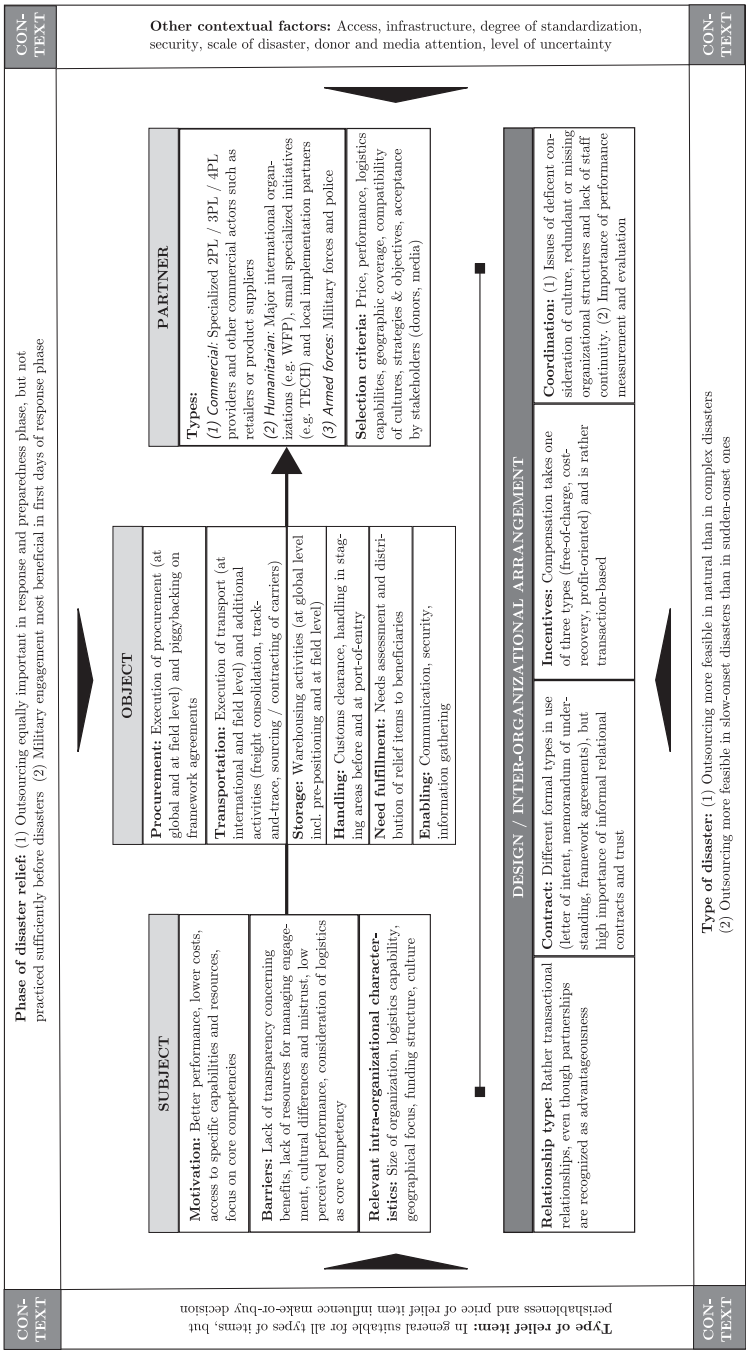


Figure 2.
Overview of current state of outsourcing in humanitarian logistics

logistic capability of the organization (expertise, equipment, etc.) are often brought up as a reason for dissimilar outsourcing practices (Balcik *et al.*, 2010; Nagurney *et al.*, 2011; Wisetjindawat *et al.*, 2014). Furthermore, the location (Bealt *et al.*, 2016; Vaillancourt, 2016), mandate (Bealt *et al.*, 2016; Vaillancourt, 2016; Balcik *et al.*, 2010), funding structure (Pazirandeh and Herlin, 2014; Vaillancourt, 2016) and culture (Paul and Wang, 2015; Nagurney *et al.*, 2011; Dowty and Wallace, 2010; Vaillancourt, 2016) are proposed as further intra-organizational characteristics with relevance for outsourcing.

4.2 Outsourcing object

Literature describes six different functions which are outsourced in humanitarian logistics: procurement, transportation, storage, handling, need fulfillment and enablement. In the following, we provide the results by function.

Procurement Procurement is mentioned as outsourcing object by ten papers. It is described both for the global and the local level, although some publications do not explicitly distinguish between the two (for example Nagurney *et al.* (2011) or Wang *et al.* (2016)). On the global level, aid agencies make use of procurement services offered by organizations like UN Humanitarian Response Depot (UNHRD), IFRC Regional Logistics Units (RLU), ECHO Humanitarian Procurement Centres (HPC), UNICEF and UN Office for Project Services (UNOPS) (Dufour *et al.*, 2018; Balcik *et al.*, 2010; Schulz and Blecken, 2010; Toyasaki *et al.*, 2017; Heaslip, 2015; Vaillancourt, 2016). On the local level, procurement can be outsourced under the lead of an umbrella organization, which manages the interface to local suppliers (Balcik *et al.*, 2010). WFP setting up a national food pipeline in Sudan is one example (Jahre *et al.*, 2010). Organizations do not only outsource the operational execution of purchasing (e.g. order management) but also the sourcing of suppliers and the negotiation of long-term agreements. In fact, access to more competitive prices through long-term agreements of established actors is a primary motivation for outsourcing procurement to providers such as UNHRD, RLU or HPCs (Schulz and Blecken, 2010). Less important is the reduction of internal costs: although some agencies have their procurement executed by UNHRD, they still keep their redundant administrative structures (Schulz and Blecken, 2010).

Transportation Transportation is the function best covered by current outsourcing literature. Although it is not possible to judge the extent of outsourcing in this area quantitatively, the numerous described empirical examples suggest that it is common practice. This is in line with Bealt *et al.* (2016) identifying it as the activity best suited for outsourcing. Also the interest of mathematical models in decisions related to transportation outsourcing (Nagurney *et al.*, 2011, 2019; Wang *et al.*, 2016; Wisetjindawat *et al.*, 2014) can be interpreted in this way. In any case, transportation outsourcing differs significantly across HOs: while for example WVI does not have any internal transportation capacity (Balcik *et al.*, 2008), WFP operates a considerable number of own trucks (World Food Programme, 2017).

Although not all articles specify the considered stage of the transportation network (before point-of-entry, after point-of entry, or last mile), outsourcing seems to be heavily used in all stages. There are many examples of this practice for international transportation up to the point-of-entry: amongst others, UNHCR leveraging UPS (Bealt *et al.*, 2016), GHM making use of Maersk (Kumar *et al.*, 2009), Technical Exchange for Christian Healthcare (TECH) contracting UPS and FEDEX (Kumar *et al.*, 2009), USDA working with a variety of carriers (Trestrail *et al.*, 2009), CEVA managing the transportation to Turkey for certain organizations (Vega and Roussat, 2015) and UNHRD as well as IFRC RLU offering transportation up to the point-of-entry to a number of HOs (Balcik *et al.*, 2010; Dufour *et al.*, 2018; Schulz and Blecken, 2010). Similarly, there are frequent examples of HOs handing over local transportation to service providers, for example, FEMA contracting local carriers after Hurricane Katrina (Dowty and Wallace, 2010), WFP outsourcing all transportation in Ethiopia (Rancourt *et al.*,

2014), the Red Cross engaging with service providers in Colombia (Sánchez Gil and McNeil, 2015), and WFP taking over transportation for a multiplicity of HOs in Sudan and Gaza (Jensen, 2012; Jahre *et al.*, 2010). The situation for last mile transportation is less clear, however. While there are examples of it being outsourced (Rancourt *et al.*, 2014; Sánchez Gil and McNeil, 2015), authors like Majewski *et al.* (2010) assume that it will always remain a core in-house function of HOs. Literature rarely specifies if outsourcing of transportation means only the physical execution of the transport, or if it also includes the related planning, management and controlling. Still it can be assumed that most of them deal with the physical execution of transports. But also cases of outsourcing other activity types can be found in literature. Freight forwarders take over steering activities like freight consolidation and track-and-trace, for example for GHM (Kumar *et al.*, 2009) or an anonymous NGO active in Haiti (McLachlin and Larson, 2011). Furthermore, service providers like UNHRD offer to negotiate framework agreements with carriers and contract them on behalf of HOs for deliveries from one of its depots (Schulz and Blecken, 2010). 4PLs, in general, coordinate the transportation planning of multiple 3PLs (Huang *et al.*, 2015).

Storage Bealt *et al.* (2016) reason, based on a survey, that warehousing should not be outsourced. However, warehousing is a focus area of large commercial providers (Majewski *et al.*, 2010) and outsourcing in this area is observed frequently (Balcik *et al.*, 2010), also as a key form of horizontal cooperation (Vaillancourt, 2016). Again not all papers specify the considered stage of the logistics network. Still, we can conclude that it occurs in all stages. Before the point-of-entry, aid agencies outsource storage activities to UNHRD (Dufour *et al.*, 2018; Schulz and Blecken, 2010; Toyasaki *et al.*, 2017), UNHRD itself outsources warehousing activities to TNT and UPS (Balcik *et al.*, 2010), DHL manages global stocks at strategic points (Vega and Roussat, 2015) and the Logistics Cluster drives a global stockpiling initiative (Jahre *et al.*, 2010). Literature also makes reference to various cases beyond the point-of-entry: the Logistics Cluster offered a system of warehouses to NGOs during the Gaza crisis (Jensen, 2012), aid agencies outsource plenty of storage activities in Colombia (Sánchez Gil and McNeil, 2015) and the operational efficiency of relief operations in Japan could be increased by leveraging commercial warehouse providers (Wisetjindawat *et al.*, 2014). According to the literature, we should see some further developments in this field. On the one hand, a 4PL provider for humanitarian logistics should offer warehousing (Abidi *et al.*, 2015). On the other hand, the military should assist aid agencies by sharing excess warehouse capacity during peace times (Heaslip and Barber, 2016). To date, this only happens on very limited occasions, for example in Afghanistan (Heaslip and Barber, 2014).

Handling There are plenty of examples of aid agencies outsourcing handling activities. A frequent example is customs clearance, which is one of the activities best suited for outsourcing according to Bealt *et al.* (2016). While UNHRD offers to manage import and export procedures for its customers (Dufour *et al.*, 2018; Schulz and Blecken, 2010; Balcik *et al.*, 2010), it partially outsources customs handling itself, for example in Ghana (Schulz, 2009). The same is true for the RLU (Schulz, 2009). TECH is another HO providing this as a service (Kumar *et al.*, 2009). Of course, commercial providers, especially freight forwarders, are also engaged with aid agencies in this area (Vega and Roussat, 2015; McLachlin and Larson, 2011). Additionally, many examples of outsourcing the physical handling of products can be found in literature (Vega and Roussat, 2015). UNHRD, on the one hand, handles products in staging areas before the point-of-entry on behalf of its customers (Dufour *et al.*, 2018; Balcik *et al.*, 2010; Schulz and Blecken, 2010). On the other hand, it outsources the handling of products at multiple airports to commercial providers (Schulz, 2009). In this context, Pazirandeh and Herlin (2014) and Paul and Wang (2015) further explain how the handling capacity at ports is considered as a specific element during the tender process of various agencies.

Need fulfillment Bealt *et al.* (2016) clearly found that activities, which are directly linked to the fulfillment of beneficiary needs, should remain in-house. Similarly, Majewski *et al.* (2010)

highlight that this function should be the core focus of aid agencies, since this is where they can apply their specific strengths and achieve differentiation from competition. Still, Sánchez Gil and McNeil (2015) report that even the distribution of relief items to the final beneficiaries is sometimes outsourced by HOs in Colombia. Moreover, organizations make use of other agencies' services when it comes to needs assessment (Hall, 2008). Iserson (2017) proposes outsourcing needs assessment to a central agency to reduce assessment fatigue and increase efficiency. The Logistics Cluster specifically aims at taking over this function from a wider number of organizations during relief operations to ensure a proper coordination in aid delivery (Jahre *et al.*, 2010; Jensen, 2012). In summary, need fulfillment does not appear to be a primary focus of outsourcing, but even within this function external services can add significant value.

Enablement HOs do not only outsource core logistics functions, but also supporting and enabling activities. While Nurmala *et al.* (2017) state that partnerships can cover support functions in general, other authors provide more specific examples. Walker (1992) and Balcik *et al.* (2010) recognize that the military is providing communication and security services to aid agencies. Bealt *et al.* (2016) find that IT is not commonly outsourced and should rather remain in-house. However, some technological services lend themselves to outsourcing, as there is an inherent lack of capabilities in HOs and specialized providers are widely available. One example for this is GPS tracking, provided both by humanitarian LSPs like UNOSAT as well as commercial providers like Inmarsat (Delmonteil and Rancourt, 2017). Abidi *et al.* (2015), Jensen (2012) and Jahre *et al.* (2010) highlight that agencies could retrieve certain information (for example, customs procedures) as an enabling service provided from 4PLs in general or from the Logistics Cluster in specific. Finally, 4PLs could offer supply chain (re-) design as a strategic service, which would span across all logistics functions (Abidi *et al.*, 2015).

4.3 Outsourcing partner

Based on current literature, we differentiate commercial, humanitarian and armed outsourcing partners. Commercial partners are mainly commercial logistics service providers (CLSPs), that is, commercial companies specialized in "manag[ing], control[ling] and deliver[ing] logistics activities on behalf of a shipper" (Hertz and Alfredsson, 2003). Other commercial companies, for example retailers like Wal-Mart or product suppliers, also take over logistics activities on behalf of governmental aid agencies (Wang *et al.*, 2016; Trestrail *et al.*, 2009; Sodhi and Tang, 2014; Carland *et al.*, 2018), but are described considerably less in literature. CLSPs appear to have a significantly higher importance as they handle substantial parts of humanitarian logistics (Majewski *et al.*, 2010). Besides their role as resource providers, they also act as coordinators and consolidators (Vega and Roussat, 2015; Jahre *et al.*, 2010; Vaillancourt, 2016). On the one hand, there are big international CLSPs such as Agility, DHL, FedEx, Maersk, TNT or UPS (Cozzolino, 2012), which have partially even created specific humanitarian business units (Vega and Roussat, 2015). As the number of CLSPs with experience in the humanitarian sector is limited and the humanitarian demand is small and fragmented in comparison to the commercial demand, these companies have a powerful bargaining position (Pazirandeh and Herlin, 2014). On the other hand, there is a huge number of local carriers and transportation service providers. These are often small businesses operating only a very limited fleet (Rancourt *et al.*, 2014; Stewart *et al.*, 2009; Sánchez Gil and McNeil, 2015). Therefore, Majewski *et al.* (2010) highlight the need for additional service providers in between these two types of providers, bridging the gap between international transportation and intra-regional distribution of goods. The relevant papers identified business development, corporate social responsibility, publicity, employee motivation and learning opportunities as prevalent reasons for CLSPs to engage in

humanitarian logistics (Vega and Roussat, 2015; Bealt *et al.*, 2016; Pazirandeh and Herlin, 2014; Majewski *et al.*, 2010). While this engagement is generally seen positively, also certain challenges and disadvantages are described in literature. Incongruent goals lead to a question of ethics (Nurmala *et al.*, 2017; Vega and Roussat, 2015), different cultures and ways of working cause friction in the collaboration (Nurmala *et al.*, 2017; Bealt *et al.*, 2016; Pazirandeh and Herlin, 2014; Prasanna and Haavisto, 2018) and security or profitability concerns can limit the range of operations (Morales and Sandlin, 2015; Paul and Wang, 2015).

HOs are also described as outsourcing partners, being referred to as humanitarian logistics service providers (HLSPs) (Vega and Roussat, 2016). In contrast to CLSPs, HLSPs do not specialize in service provision, but rather provide services as part of their humanitarian mission. As they target to improve the overall efficiency of the system (Majewski *et al.*, 2010; McLachlin and Larson, 2011), they often offer services free-of-charge or based on cost-recovery, relying themselves on funding through donors. It is unclear if HLSPs will compete with CLSPs in the future. While some authors consider this possible (Vega and Roussat, 2015, 2019) or see coopetition as a potential result (Vega and Roussat, 2019), others do not expect any competition (Schulz and Blecken, 2010) but rather a co-dependent system (Majewski *et al.*, 2010). Most probably this will also depend on the offered services – an area requiring further research (Heaslip, 2013). Based on our review, we differentiate three groups of HLSPs: major HOs, specialized smaller initiatives and local implementation partners. The first group consists of international agencies like WFP, IFRC, MSF, UNICEF and UNOPS, which all have developed dedicated divisions to offer logistics services to other HOs (Vega and Roussat, 2015; Heaslip, 2015). The Logistics Cluster and ECHO HPCs are also included in this group (Jahre *et al.*, 2010; Jensen, 2012; Abidi *et al.*, 2015; Schulz and Blecken, 2010). The second group of HLSPs are smaller and specialized organizations. TECH acting as a freight consolidator for Christian organizations (Kumar *et al.*, 2009) is one example. Finally, there are local NGOs or authorities acting as subcontractors and implementation partners for last mile distribution (Balcik *et al.*, 2010; Sánchez Gil and McNeil, 2015; McLachlin and Larson, 2011; Morales and Sandlin, 2015). Often, partnerships with HLSPs experience difficulties. Divergence in goals (Toyasaki *et al.*, 2017), a possible lack of fairness during service provision (Jahre *et al.*, 2010; Jensen, 2012), dependency on potential competitors (Majewski *et al.*, 2010) and low efficiency compared to CLSPs (Schulz and Blecken, 2010) are among the most referenced ones.

The military is the main armed outsourcing partner, but also police units can take this role (Sánchez Gil and McNeil, 2015). Armed forces have played an important role during many disaster relief operations by providing airlifts, storage and other logistics services (Balcik *et al.*, 2010; McLachlin and Larson, 2011; Heaslip *et al.*, 2012; Morales and Sandlin, 2015). In these cases they are often treated like commercial suppliers (Walker, 1992). While collaboration in the field generally works (Heaslip and Barber, 2014), there is continuous criticism about the military competing with HOs as key actors and taking other roles than security and combat (Walker, 1992; Hall, 2008; Heaslip and Barber, 2016). As a prime example, the UN Oslo Guidelines call for using military assets only when no feasible civilian alternative exists (Morales and Sandlin, 2015). Similarly, IFRC hiring more expensive providers to avoid the use of available military assets in Pakistan emphasizes this tense relationship (Heaslip *et al.*, 2012). Still, governments increasingly consider sending their troops as one form of humanitarian aid (Hall, 2008). One reason is the advantages they bring to humanitarian logistics, like their rapid operational readiness, self-sufficiency, ability to operate under harsh conditions and well-suited resources, technologies and capabilities (Walker, 1992; Hall, 2008; Silenas *et al.*, 2008; Heaslip and Barber, 2014, 2016; Morales and Sandlin, 2015). However, the use of the military can compromise the neutrality and impartiality of aid agencies (Walker, 1992; Morales and Sandlin, 2015). Furthermore, the cooperation often suffers from a lack of experience in working together (Walker, 1992; Hall, 2008) and different organizational objectives, routines and cultures (Hall, 2008; Heaslip *et al.*,

2012; Heaslip and Barber, 2014, 2016; Morales and Sandlin, 2015). Therefore, the discussion about the use of armed forces as outsourcing partners can be expected to continue.

While Vega and Roussat (2015) note that further research is required to identify the criteria for selecting appropriate partners, the literature provides some guidance. Price, performance, logistics capability and geographic coverage are brought up most frequently (Pazirandeh and Herlin, 2014; Paul and Wang, 2015; Morales and Sandlin, 2015; Vega and Roussat, 2015). The compatibility of cultures, strategies and objectives is proposed as a further dimension (Dowty and Wallace, 2010; Heaslip *et al.*, 2012). Also, the acceptance of the provider by stakeholders like donors or the media is highlighted as an important aspect of partner selection (Heaslip *et al.*, 2012; Morales and Sandlin, 2015). Existing literature also touches some elements of the tender process. For example, consolidating service demands and running joint tenders can improve the bargaining position of aid agencies (Pazirandeh and Herlin, 2014). Moreover, organizations should promote cooperation between product suppliers and carriers on tenders in order to integrate and optimize the purchasing and delivery of products (Trestrail *et al.*, 2009; Bagchi *et al.*, 2011; Paul and Wang, 2015).

4.4 Outsourcing design

We use the framework by Hauptmann (2007) to structure the heterogeneous insights regarding inter-organizational arrangements in outsourcing. The framework differentiates four dimensions: type of relationship, contract, incentive system and coordination.

Outsourcing relationships in humanitarian logistics are rather short-term and transactional than oriented towards long-lasting partnerships (Pazirandeh and Herlin, 2014; Paul and Wang, 2015; Rancourt *et al.*, 2014; Stewart *et al.*, 2009). This is not only true for relationships with CLSPs, but also for those with HLSPs (Schulz, 2009; Jensen, 2012). For example, customers of UNHRD are considered "authorized users" and not partners (Toyasaki *et al.*, 2017). As one important reason, literature recognizes the reality of "hastily formed networks" (Tatham and Kovács, 2010), in which a lack of time and trust hinders the creation of partnerships (Bealt *et al.*, 2016; McLachlin and Larson, 2011)

Furthermore, the organizational self-perception of aid agencies can keep them from starting long-term collaborations (Jensen, 2012). Still, real partnerships on global and local levels would be beneficial for the efficiency of the humanitarian sector (Kumar *et al.*, 2009; Majewski *et al.*, 2010; Paul and Wang, 2015). Framework agreements and pre-negotiated agreements are seen as key measures for building these partnerships (Majewski *et al.*, 2010). However, such agreements can also be subject to further performance improvement, as Wang *et al.* (2019) show concerning bonus contracts. Similarly, 4PLs as "strategic partners" could contribute in this area (Abidi *et al.*, 2015).

One of the roles of the contract in humanitarian logistics is to achieve a level of risk sharing, accountability and transparency (Stewart *et al.*, 2009; Baharmand *et al.*, 2017). While a few examples of multi-year contracts exist (Pazirandeh and Herlin, 2014), the duration is often limited to six months at most (Rancourt *et al.*, 2014; Paul and Wang, 2015). They can take the form of informal agreements (Balcik *et al.*, 2010; McLachlin and Larson, 2011), semi-formal letters of intent and memorandums of understanding (Pazirandeh and Herlin, 2014; Toyasaki *et al.*, 2017; Rancourt *et al.*, 2014; McLachlin and Larson, 2011) or formal contracts (Egan, 2010; Majewski *et al.*, 2010). In any case, the high importance of specifying performance measures and judging the contract fulfillment based on these is emphasized (Nurmala *et al.*, 2017; Majewski *et al.*, 2010). However, the humanitarian context brings a specific challenge in this regard: LSPs can declare themselves incapable to fulfill the contract due to the disaster. The relevance of this can be seen in Pazirandeh and Herlin (2014), when setting up a transportation contract failed because of disagreements about the liability terms. Consequently, formal contracts alone do not ensure performance in humanitarian logistics

and more complex approaches are required (Egan, 2010; Stewart *et al.*, 2009). For example, the type of contract should rather be relational, mainly based on trust and commitment instead of legal bonds (Heaslip *et al.*, 2012; Stewart *et al.*, 2009; Pazirandeh and Herlin, 2014; McLachlin and Larson, 2011). Heaslip and Kovács (2019) found that relational contracts are better suited for engagements between donors and end customers, while formal contracts are more suitable between donors and LSPs. Hybrid contracts could improve the alignment of all actors. Also framework agreements are frequently emphasized as a contract type with great importance for humanitarian logistics. Rancourt *et al.* (2014) describe an example where the transportation rates are contractually fixed, but no other binding agreements are given by either party. Gossler *et al.* (2019b) show the positive effect of framework agreements on the impact of long-term humanitarian operations. Besides liabilities, payment terms are brought up as another challenge for contract design (Pazirandeh and Herlin, 2014). Due to differences in the funding structure of aid agencies, different payment terms are required.

In regard to incentives, three general approaches to pricing are described: free-of-charge, cost-recovery and profit-based. Free-of-charge services – also called in-kind or philanthropic services – are offered by commercial providers (Vega and Roussat, 2015; Balcik *et al.*, 2010; Nurmala *et al.*, 2018), humanitarian providers (Toyasaki *et al.*, 2017; Dufour *et al.*, 2018) and the military (Walker, 1992; Silenas *et al.*, 2008). Some services within UNHRD and HPCs are examples of cost-recovery (Toyasaki *et al.*, 2017; Schulz, 2009). Literature however indicates that the discussion about free-of-charge and cost-recovery services is not closed yet (Toyasaki *et al.*, 2017). On the one hand, providers lack relevant shares of operational funding given the current prices. On the other hand, free-of-charge services can lead to free-rider issues. Therefore, charging premium fees for UNHRD customers is considered as one option (Toyasaki *et al.*, 2017). Also different charges for different customer groups are seen as a possibility, for example by the IFRC RLU (Schulz and Blecken, 2010). For profit-oriented prices, market competition, available infrastructure and existing risks are key determinants (Rancourt *et al.*, 2014). Furthermore, Paul and Wang (2015) describe how the rates of carriers are stepwise increasing in volume. As a possible reply, Kumar *et al.* (2009) recommend to negotiate lower prices in the name of philanthropy. Two other approaches to improve the incentive structure for profit-oriented relationships can be found in literature. Balcik *et al.* (2010) recommend to establish more flexible types of compensation, incentive-based rather than output-oriented. Measuring the performance of a 4PL based on the level of value creation, as proposed by Abidi *et al.* (2015), goes in this direction. Another direction is implied by Bealt *et al.* (2016): as aid agencies' understanding of the costs of logistics service providers is identified as a major impediment, cost transparency through an open book approach could be helpful to create trust.

Literature also takes into account the importance of arranging appropriate coordination between the subject and the partner, for example as part of the "partnership implementation phase" (Heaslip *et al.*, 2012). Plenty of issues with respect to the related decisions are given: a deficient consideration of culture (Dowty and Wallace, 2010; Heaslip *et al.*, 2012), redundant or missing organizational structures (Pazirandeh and Herlin, 2014; Schulz, 2009) and a lack of staff continuity on the side of the aid agency (Bealt *et al.*, 2016; Pazirandeh and Herlin, 2014; McLachlin and Larson, 2011). As such deficiencies cause waste and inefficiencies (Dowty and Wallace, 2010), some papers provide recommendations for the organizational setup. A strong integration, physical presence and high visibility are general guidelines (Morales and Sandlin, 2015). Furthermore, it is proposed to regularly evaluate partnerships (Heaslip *et al.*, 2012) and renew only those with reliable and well performing providers (Majewski *et al.*, 2010). Given the strong power position of suppliers (Pazirandeh and Herlin, 2014), measures for reducing dependencies also need to be part of the outsourcing design. Leveraging multiple suppliers and joint initiatives with other agencies are possible examples (Kumar *et al.*, 2009; Pazirandeh and Herlin, 2014).

4.5 Outsourcing context

Literature mentions three main contextual and environmental conditions with relevance for outsourcing decisions: the phase of disaster relief, the type of disaster and the type of relief item. Outsourcing engagements can be found in all phases of disaster relief operations, but vary with the phase (Wang *et al.*, 2016; Vega and Roussat, 2015; Paul and Wang, 2015). For example, incentives, partner selection criteria and outsourced activities change throughout the phases (Falagara Sigala and Wakolbinger, 2019). While the focus of many papers is the response phase (see for example Dowty and Wallace (2010); Rancourt *et al.* (2014) or Sánchez Gil and McNeil (2015)), Vaillancourt (2016) emphasizes that the preparedness phase is well suited for consolidation activities. UNHRD is a famous example in this regard (Schulz and Blecken, 2010; Dufour *et al.*, 2018). Bealt *et al.* (2016) even find that outsourcing is equally important in the preparation and the response phase. However, only few engagements are actually set up before the disaster. Kim *et al.* (2019) describe supplier selection in this phase. The use of logistics services by the military is considered most valuable in the first days after a disaster (Walker, 1992; Heaslip *et al.*, 2012; Heaslip and Barber, 2014, 2016). During mitigation and recovery, in turn, outsourcing is considered less important.

Literature also contains references to outsourcing engagements for all types of disasters: natural, man-made and complex as well as sudden-onset and slow-onset. The disaster type seems to impact the outsourcing decision (Sánchez Gil and McNeil, 2015; Abidi *et al.*, 2015; Bealt *et al.*, 2016). In general, outsourcing is considered a better fit for disasters which allow a certain level of planning (Vaillancourt, 2016; Rancourt *et al.*, 2014). Therefore, floods are better suited than earthquakes (Sodhi and Tang, 2014). Furthermore, outsourcing appears more achievable in natural than in complex disasters (Heaslip and Barber, 2014).

Furthermore, outsourcing is observed for many types of relief items, both food (Sánchez Gil and McNeil, 2015; Rancourt *et al.*, 2014; Trestrail *et al.*, 2009) and non-food items like ice, medical supplies, blankets or equipment (Dufour *et al.*, 2018; Dowty and Wallace, 2010; Kumar *et al.*, 2009; Vega and Roussat, 2015). While this suggests a general suitability for all types of relief items, Wang *et al.* (2016) find that the perishableness and the price of the relief item can change the make-or-buy decision. Yao *et al.* (2018) assess similar factors, including unit cost, inventory cost and perishableness, for decisions about outsourcing of relief item prepositioning. Similarly, Vaillancourt (2016) emphasizes that the consolidation of items through a service provider can be difficult as often items cannot be mixed with each other. Contractual issues seem to be the same for all types of items (Egan, 2010).

Further contextual factors besides the relief phase, disaster type and item type are briefly referenced in literature: access and infrastructure (Jahre *et al.*, 2012; Rancourt *et al.*, 2014), degree of standardization (Vaillancourt, 2016), security (Jahre *et al.*, 2012; Vaillancourt, 2016; Rancourt *et al.*, 2014), scale of disaster (Sodhi and Tang, 2014; Heaslip and Barber, 2014), donor and media attention (Heaslip *et al.*, 2012; Jahre *et al.*, 2012) and level of uncertainty (Paul and Wang, 2015). While these factors are considered to be relevant for outsourcing engagements, it is not specified in which way.

The analysis of the literature on HO outsourcing along the lines of the framework of Arnold (2000) led to the adapted framework in Figure 2. The center of the framework summarizes the characteristics of the outsourcing subject, object and partner. That is, the HO leveraging outsourcing, the outsourced activities and the organization providing the services. At the bottom the most important aspects of the outsourcing design are highlighted, such as contractual issues and inter-organizational factors. As HOs operate in a truly specific environment, the frame around the framework emphasizes important characteristics of the context in which outsourcing is implemented.

5. Evolution of outsourcing in humanitarian logistics

The previous section described the current practice of outsourcing in humanitarian logistics. This section investigates the potential development of the practice over the next five to ten years.

As first step we reviewed recent scientific literature for insights in this regard. However, the literature describes only very limited findings. Some mention a trend for increased use of LSPs in humanitarian operations (Kim *et al.*, 2019). Others restrict this by highlighting that only a limited range of LSPs have the required capabilities to engage in strategic outsourcing collaboration (Cozzolino *et al.*, 2017). Another trend identified by the literature is the increased use of HOs as LSPs (Vega and Roussat, 2019), which goes hand in hand with a trend of servitization of the humanitarian supply chain (Heaslip *et al.*, 2018). That is, international HOs increasingly offer services to other HOs. Examples for this are logistics services by WFP through the Logistics Cluster (Heaslip *et al.*, 2018) or the GPS tracking services offered by HumaNav of UNOSAT (Delmonteil and Rancourt, 2017).

To improve this limited picture of trends in humanitarian outsourcing practices, we have conducted a Delphi study and a complementary full-day focus group with experts from aid agencies and LSPs (see Section 2). As Table 2 shows, the experts identified ten potential developments for outsourcing in humanitarian logistics. Two trends are related to the outsourcing subject and one to the outsourcing object. Three trends make reference to each the outsourcing design and the outsourcing partner. One trend is an overall trend. Furthermore, six trends (Trends 1 to 6) were agreed to be "Very likely" (mean rating ≥ 3.50).

No.	Trend	Description	Element	Rating*
1.	Increase of outsourcing	Outsourcing logistics of disaster relief to commercial LSPs will increase in general	Overall	3.67
2.	More professional aid agencies	Aid agencies will become more professional when it comes to implementing and running engagements with commercial LSPs	Subject	3.85
3.	Digitalization as facilitator	Digitalization (e.g. new technologies) will simplify the engagement of commercial LSPs	Design	3.56
4.	Specific services for aid agencies	Commercial LSPs will offer more services targeting specifically the needs of aid agencies	Partner	3.85
5.	Increase of partnerships	Relationships between aid agencies and commercial LSPs will move from transactional interactions to partnerships	Design	3.85
6.	More cooperation of aid agencies	Cooperation between aid agencies with respect to the engagement of commercial LSPs will increase (e.g. joint framework agreements)	Design	3.63
7.	Rise of humanitarian LSPs	More logistics services will be offered by humanitarian LSPs (e.g. UNHRD) and these will compete with commercial LSPs	Partner	3.45
8.	Decrease of international shipments	There will be less need for international shipments (be-cause of local procurement and cash-transfer programs)	Object	3.04**
9.	Responsibility of product suppliers	More logistics activities (e.g. transportation up to point-of-entry) will be managed by suppliers of relief products	Partner	3.11**
10.	Need for professional support	Aid agencies will have to hire more professional support for engaging commercial LSPs (e.g. consultants running the tenders)	Subject	3.11**

Note(s): *Mean rating by 27 experts (Rating scale: 1 – Very unlikely | 2 – Unlikely | 3 – Likely | 4 – Very likely)
**No distinct agreement of experts ($r_{wg} < 0.30$ or $IQR > 1.00$)

Table 2.
Trends predicted by experts

Trend 7 was found to be likely (2.50 ≤ mean rating < 3.50). There was no consensus among panelists with respect to the likelihood of Trends 8 to 10 ($r_{wg} \leq 0.30$ or $IQR > 1.00$). The average ratings of these trends (3.04, 3.11, 3.11) are due to the split of the expert group: while some participants considered them very likely, others deemed them rather unlikely. We will now describe all trends in detail, starting with the trends which have reached agreement among the experts. Afterwards, we will present the controversial trends and outline the alleged reasons for disagreement. The trends are presented in the same sequence in which they were presented to the experts in the second round.

In general, experts consider it very likely that outsourcing of disaster relief logistics to commercial LSPs will increase in the future (see *Trend 1: Increase of outsourcing*). Simultaneously, aid agencies are very likely to become more professional in managing outsourcing engagements (see *Trend 2: More professional aid agencies*). The panelists described a number of developments which could drive these trends. First of all, aid agencies face an increasing need to professionalize their logistics, which is due to a strong pressure from donors and an intensified competition in the humanitarian sector. Moreover, the logistics environment is perceived as getting more and more complex, which causes a growing demand for logistics expertise. At the same time, organizations struggle to build logistics competence internally, because the lack of financial resources restricts the possibilities of talent development. In light of this, engaging commercial LSPs is very likely to grow in importance, since it allows to source professional logistics capabilities from outside the organization. In the future, even "donors may refer [. . .] well-known LSPs to the aid agencies while funding for specific projects" (E22) [2] An increase of outsourcing could also be caused by aid agencies becoming more sensitive with respect to the interrelations between humanitarian and development aid. In order to account for the existing interdependencies, organizations are searching for opportunities to develop local economies and markets while providing disaster relief. One related approach is engaging local LSPs in the disaster-affected countries instead of making use of an organization's own logistics assets.

According to the panelists, the increase of outsourcing is very likely to be facilitated by digitalization (see *Trend 3: Digitalization as facilitator for increased outsourcing*). Today, the humanitarian sector lags significantly behind the commercial sector in this regard, since financial restrictions have limited aid agencies' investments into technology. Experts highlighted, however, that nowadays more relevant applications are available at low costs than in the past: "We see a lot of new applications which could really help [. . .][and] are not as expensive as [they were] previously, when you would have [had] to invest quite a lot of resources" (E35). Therefore, panelists consider it very likely that more and more agencies will digitalize their logistics processes. This would not only simplify the interaction with external providers, but also implicate a certain level of standardization across organizations. Both changes would ease the integration of LSPs into disaster relief operations and, consequently, trigger organizations to make more use of outsourcing.

At the same time, these changes would also make it easier for LSPs to engage in disaster relief. Experts consider this another possible boost for the interest of LSPs in the humanitarian sector, which is perceived as growing considerably. One panelist explained, for instance, that "five yrs ago, one logistics company per month contacted me, and nowadays two every week" (E12). The motivation of LSPs is twofold and, according to experts, prone to conflicts. On the one hand, they experience a rising societal pressure for demonstrating corporate social responsibility. On the other hand, they start to recognize the opportunity of building profitable business relationships with aid agencies. Panelists consider it very likely that LSPs, in order to seize this opportunity, will "adjust to this important group of customers" (E25) and develop more services which specifically target the needs of aid agencies (see *Trend 4: Specific services for aid agencies*). For example, they might expand their operations into geographic areas which have traditionally not been within their scope of

services. Similarly, they might provide 24 h of availability, short-term stock releases, and procurement services aligned to public procurement regulations more frequently. Some experts consider it even possible that LSPs will offer to consolidate shipments across agencies or to manage the distribution of relief items to beneficiaries.

Panelists also think that the way in which outsourcing is practiced might undergo some changes in the future. For instance, they deem it very likely that relationships between aid agencies and CLSPs will evolve from transactional interactions to more strategic partnerships (see *Trend 5: Increase of partnerships for outsourcing from HOs to commercial LSPs*). These partnerships will bring "value for both parties" (E08) and "create win-win situation[s]" (E34). Moreover, in order to "structure and stabilize the business relationships" (E23), HOs are expected to make more use of long-term contracts and framework agreements, instead of relying on short-term contracts for one-off engagements. As one consequence, LSPs will most probably get more involved in disaster preparedness. For example, if a disaster-prone area has a lack of reliable service providers, this "is also brought to the attention of the private sector, and they are part of finding out the solution on how to move forward on this" (E08).

Furthermore, experts consider it very likely that aid agencies will cooperate more with each other in the context of outsourcing (see *Trend 6: More cooperation on outsourcing between aid agencies*). Cooperation might take different forms. For example, organizations might exchange more information regarding service providers and their performance in order to ease the identification of qualified LSPs. Likewise, they might increase the extent to which they consolidate shipments and share warehouse facilities. This would lead to cost savings through economies of scale. Also, they might form consortia to jointly negotiate framework agreements with service providers more often, since aggregating demands would increase their bargaining power. Even when not forming consortia, agencies might grant other organizations access to their existing framework agreements more widely. For instance, UN agencies frequently piggyback on framework agreements of sister agencies, and it is currently explored "if those framework agreements could also be [made] available to NGOs, not just the UN" (E08). Panelists are optimistic that these or similar types of cooperation will grow in number, because donors are more and more pushing for it. Declarations such as the Grand Bargain (UN OCHA, 2018) point in this direction. Moreover, given the intensified competition in the sector, experts believe that organizations have a strong own interest to exploit the benefits of cooperation: "who is not willing to cooperate, to do business together and see what [. . .] advantages others have, will lose [. . .] track [of competition]" (E06). While generally being optimistic with respect to cooperation between aid agencies, panelists also highlighted that political decisions, inflexible organizational rules, and non-harmonized policies, procedures and IT systems might be serious stumbling blocks in this regard.

Closely related to the topic of cooperation between aid agencies are HLSPs (Schulz and Blecken, 2010). Experts consider it likely that HLSPs will increase in importance and, at the same time, expand their service offering (see *Trend 7: Rise of humanitarian LSPs*). This trend is, in fact, also fostered by the Logistics Cluster, which tries to enable more NGOs to provide logistics services to other agencies. The ultimate objective is to establish better logistics infrastructure in regions "where [the] private sector cannot [provide services] and WFP is not well suited, either" (E08). According to experts, it is not clear to which extent HLSPs will compete with CLSPs. On the one hand, HLSPs can often draw on in-kind donations, such as the complimentary usage of warehouse facilities. Therefore, they can offer services to other aid agencies free-of-charge or at cost-recovery. CLSPs, on the other hand, usually provide better performance and offer more diverse services. Given these relevant differences, it is considered most likely that HLSPs will rather act as supplement to CLSPs than as substitute. For instance, aid agencies might only turn to HLSPs when services are provided free-of-charge.

It is also possible that services of HLSPs will be mainly relevant "in remote locations where minimal infrastructure and commercial options are available" (E24). Another possibility is that CLSPs remain focused on traditional 2PL/3PL services while HLSPs specialize in 4PL like services and act as coordination layer between aid agencies and CLSPs. For example, HLSPs might focus on the sourcing of CLSPs on behalf of aid agencies or on the consolidation of shipments from different HOs. Such constellations can, in fact, already be observed today, since "services provided by the humanitarian community [are] often provided through a private service provider" (E08).

A further potential development related to outsourcing of logistics in disaster relief is, according to the panelists, a reduction of international, long-haul shipments by aid agencies (see *Trend 8: decrease of international shipments*). HOs are increasingly procuring relief items on regional or local markets in order to save transportation costs, reduce their environmental footprint, support local economies and enable needs-based procurement. This practice of "regionalization and localization" (E30) is facilitated by the fact that more information on local and regional markets is becoming available globally. Moreover, the capacities of developing countries to produce products for disaster relief are constantly growing. In addition to regionalization and localization, more and more organizations are substituting the international delivery of relief items by cash-transfer based programs, which provide money to beneficiaries for buying products on local markets. While panelists agree that both approaches will be used more in the future, they have controversial views regarding when and to which extent they will impact the volume of international relief shipments. Firstly, international shipments will always be mandatory when local "markets are not functional [. . .] after a disaster" (E25), which is often the case. Moreover, some products, such as drugs or blankets, are seldom available on local markets, because countries do not have the required production capability or capacity. Additionally, the scale of disaster relief is constantly growing and, therefore, the total volume of international shipments might not decrease, even when alternative forms of relief gain importance.

According to the experts, it is also possible that in the future more logistics activities will be managed by suppliers of relief products rather than by aid agencies (see *Trend 9: Responsibility of product suppliers*). For instance, suppliers might increasingly be asked by aid agencies to handle the transportation to the point-of-entry instead of providing the items ex-works. Accordingly, LSPs would more often be "getting requests from relief product suppliers [. . .] to handle the movements for them" (E20). While this development would imply a change in the customer base for LSPs, it would bring considerable administrative simplifications for HOs. They would have to coordinate less product pick-ups, manage less export procedures, and tender less transportation services. Also, they would be able to transfer more transportation risk to suppliers.

Still, experts are not certain if this development would be beneficial for the field of disaster relief. Transportation itself might be more expensive compared to when it is tendered by the organizations themselves. Moreover, aid agencies would have less control and transparency, which is particularly critical when managing urgent deliveries for disaster relief. Panelists highlighted that, for these reasons, "this [approach] is the complete opposite to what the commercial world is doing" (E13). Commercial enterprises are integrating their supply chains more and more in order to increase their level of control and transparency.

Finally, some experts predict that aid agencies will require more external help to manage outsourcing engagements in the future (see *Trend 10: Need for professional support*). For example, given the complexity of long-term legal contracts, "there is probably going to be a need for [. . .] consultants to actually cut [. . .] framework agreements" (E28). Similarly, external consultants might be required to efficiently manage and orchestrate large-scale tenders for logistics services. Other experts, however, highlighted that "donor-specific regulations and sector-specific requirements sometimes inhibit outsourcing to private

consultants" (E04). Moreover, despite the advantages of external consultants, aid agencies "really need to have some competency in-house in order to manage the outsourced contract" (E05), because when the "consultants leaves, and you have no clue how to run that contract, [. . .] you are worse off" (E05). Therefore, panelists are divided with respect to the likelihood of aid agencies relying more on external expertise for managing outsourcing engagements in the future.

6. Research gaps and future research directions

In this section, we describe the most important research gaps by synthesizing the results from the literature review and the Delphi study. Additionally, we propose research questions targeting an in-depth understanding of the five dimensions of outsourcing and propose suitable research methods.

Two research gaps span across the five dimensions. First, publications often do not sufficiently specify all relevant aspects of the outsourcing engagements under analysis. Frequently, important characteristics (e.g. the geographical location or the type of contract) are neglected. We propose that future research designs should always consider all relevant dimensions of Figure 2. Second, the evaluated literature is not well integrated yet with important outsourcing theories such as transaction cost economics or the resource-based view. Future research should put its findings into the context of these theories. This would broaden the conceptualized base of outsourcing (Lukassen and Wallenburg, 2010) and contribute to requested theory-building in research on humanitarian logistics (Kovács and Spens, 2011).

6.1 Outsourcing subject

Figure 2 provides an overview of topics addressed with respect to the outsourcing subject. Intraorganizational characteristics that were discussed in the literature include the size of a HO as well as its logistics capability, geographical focus, funding structure and culture. However, a wider array of intra-organizational characteristics are important in humanitarian logistics. For example, HOs differ with respect to their sector, their governance structure, their mandate (Kovács *et al.*, 2009), age (Vega and Roussat, 2016), and geographical focus (Schulz, 2009). We believe that it would be important to explore the implication of these intra-organizational characteristics for decision-making in the context of outsourcing. We propose the following research question:

RQ1. Which intra-organizational characteristics are relevant for outsourcing decision-making and how do these characteristics impact the outsourcing process?

Cross-case analysis of case studies can help to identify important differences between cases and their implications. Moreover, it would allow for more generalization than single-case studies, which have been predominant in this field of research. Therefore, it would be a good fit to address the above research question.

Our findings suggest that aid agencies will become more professional with respect to outsourcing engagements, but at the same time might have to hire more professional support for engaging LSPs in the future. Given these contradictions, developing a framework which can successfully guide agencies from the initial make-or-buy decision to the regular controlling of ongoing engagements would offer significant value for the humanitarian sector. There has already been quite some work in this area for business logistics (e.g. Sink and Langley (1997) and Gould (2003)). However, outsourcing inevitably needs to be managed differently in the humanitarian context. Therefore, we suggest investigating questions similar to the following:

RQ2. How can HOs successfully set up and manage their outsourcing engagements?

Measuring success is challenging in humanitarian logistics because of the well-documented lack of performance data and indicators (Abidi *et al.*, 2014; Beamon and Balcik, 2008; Schulz, 2009). Therefore, the Delphi method, potentially complemented by expert interviews, could be a good methodological fit for this research question. The method allows to leverage the knowledge of experts in a structured way and can be used for transforming individual opinions into group consensus (Dalkey and Helmer, 1963; Hasson *et al.*, 2000; Rowe and Wright, 2011). Accordingly, a Delphi study with experts in outsourcing could be used to identify established practices of aid agencies for setting up and managing their outsourcing engagements.

6.2 Outsourcing object

Humanitarian logistics deals with planning, implementing and controlling the flow of relief items (Thomas, 2003). The different types of activities focus on different time horizons (Blecken, 2010). Still, we found that literature does usually not consider this difference. For instance, it is frequently proposed that transportation should be outsourced, but rarely specified if the proposal refers to the physical transport or to its planning and controlling. Moreover, environmental conditions of humanitarian operations are very diverse (Holguín-Veras *et al.*, 2012). For example, transportation outside the disaster-affected country is very different from last-mile transportation. Nevertheless, we found that literature rarely specifies the geographical location. Not all types of activities and all geographical locations are equally suited for outsourcing. We believe that research which specifically addresses these facets of the outsourcing object would increase the relevance of research for practice considerably. Therefore, we raise the following research question:

RQ3. Which activities are best suited for outsourcing, considering the function, time horizon and geographic location of activities in humanitarian logistics?

As for research question 2, the structured aggregation of expert opinions through a Delphi study could deliver a response to this question. In order to ensure a comprehensive analysis, however, future research should leverage available activity or process frameworks for humanitarian logistics. While references exist (Tufinkgi, 2006; Blecken and Tatham, 2010; FEMA, 2012), these have not been used to systemize the investigation of the outsourcing object.

6.3 Outsourcing partner

Our literature review has identified three types of outsourcing partners in humanitarian logistics: commercial, humanitarian and armed LSPs. Our Delphi study has shown that CLSPs will increasingly enter the humanitarian sector (see Trend 4 of Table 2) and that HLSPs are very likely to gain considerable importance in the future (see Trend 7 of Table 2). Additionally, experts have indicated that suppliers of relief products might play a bigger role in planning and implementing logistics (see Trend 9 of Table 2). As our research has shown, each type of service provider brings specific benefits and implies specific downsides. It is, therefore, very important to investigate, which type of service provider is most suited for which type of situation and service. Since aid agencies require guidance on how to select between different service providers, we propose the following research question:

RQ4. Which criteria should HOs apply in order to choose an appropriate outsourcing partner?

In line with Selviaridis and Spring (2007), we think that investigating outsourcing from service providers' perspective constitutes an important contribution to the development of

the field. Heaslip (2013) highlights that more research is required regarding potential services in humanitarian logistics. Moreover, experts expect CLSPs to offer more services targeting specifically the needs of aid agencies (see Trend 4 of Table 2) and HLSPs to broaden their service offering (see Trend 7 of Table 2). It is also believed that LSP services can contribute to improving the coordination between aid agencies (Schulz and Blecken, 2010; Vega and Roussat, 2015; Vaillancourt, 2016). Therefore, we propose to investigate research questions similar to the following:

RQ5. Which further services should LSPs develop for the field of humanitarian logistics in order to add more value as outsourcing partners?

With regard to methodology, we found that the existing empirical foundation mainly consists of single case studies. While these provide detailed insights into certain aspects, they fail to capture the universal trends and practices within the humanitarian sector. Therefore, we propose to broaden the empirical base. One promising method are surveys (Selviaridis and Spring, 2007), which could, for example, help to assess the development of service provider markets or to determine the relevant criteria for provider selection.

6.4 Outsourcing design

The outsourcing design specifies how the inter-organizational arrangement is constructed. It is a key success factor for any outsourcing engagement. Hauptmann (2007) differentiates four dimensions of the logistics outsourcing design: type of relationship, contract, incentive system and organization.

A comparison of existing literature with this framework shows that many important dimensions have not yet been researched for humanitarian logistics. The humanitarian sector faces some very specific challenges, which need to be taken into account for the inter-organizational arrangement. These include the problem of the legal enforcement of contracts (Egan, 2010), the importance of swift trust in hastily formed networks (Tatham *et al.*, 2010) and the lack of performance metrics (Beamon and Balcik, 2008; Schulz, 2009). Future research should assess the impact of these specifics on the outsourcing design and identify which inter-organizational arrangements are best suited. This also includes to investigate the application of more flexible compensation models (Balcik *et al.*, 2010), the use of open-book contracts (Bealt *et al.*, 2016), the development of more long-term partnerships (Nurmala *et al.*, 2017; Trend 5 of Table 2) and the role of IT for coordination (Trend 3 of Table 2). Research questions could be similar to the following:

RQ6. How should inter-organizational outsourcing relationships in humanitarian logistics be designed?

Establishing better cooperation and coordination between aid agencies is currently one of the most important objectives for the humanitarian field (Moshtari and Gonçalves, 2011; Jahre *et al.*, 2010; Balcik *et al.*, 2010; Altay and Pal, 2014; Akhtar *et al.*, 2012). Our Delphi study indicates that practitioners are optimistic with respect to HOs cooperating more in the future with respect to outsourcing (see Trend 6 of Table 2). However, it is not clear how this will be achieved. For example, initiatives for cooperative purchasing of freight services have failed in the past (Pazirandeh and Herlin, 2014). In order to account for the great importance of this topic, we propose an additional research question:

RQ7. How can the successful cooperation of aid agencies with respect to outsourcing be achieved?

Game theory could be a very fitting approach to explore the two proposed research questions, since it allows to take into account the individual objectives of multiple independent actors. Accordingly, game-theoretic models could investigate the behavior of individuals in different

inter-organizational outsourcing arrangements and derive recommendations for a successful outsourcing design. Moreover, stakeholder theory (Freeman *et al.*, 2010) and the theory on organizational culture (Marasco, 2008) could increase the theoretical validity of the findings. Finally, existing research has used auction theory to study the financial components of the outsourcing design. This line of research could also be further pursued.

6.5 Outsourcing context

Trend 1 identified by the Delphi study indicates that outsourcing in humanitarian logistics will increase. Outsourcing can bring many advantages for aid agencies, but also implies considerable downsides and risks. Hence, it is of great importance to evaluate in which cases outsourcing can actually add value to disaster relief.

The very diverse operational and environmental conditions of humanitarian operations need to be taken into account explicitly for decision-making in humanitarian logistics (Holguín-Veras *et al.*, 2012). They impact how organizations design their supply chain (Keßler, 2012) and, consequently, how they determine outsourcing objects, select outsourcing partners and design outsourcing engagements. Relevant operational characteristics of humanitarian logistics are the cause of disaster, the speed of disaster occurrence and the phase of disaster relief (Van Wassenhove, 2006; Kovács *et al.*, 2009). These account for major differences with regard to the level of uncertainty, the importance of speed, the level of security, the extent of media attention and the level of donor funding (Van Wassenhove, 2006). Environmental characteristics, which need to be taken into account for humanitarian decision-making, can be categorized into economic, political, demographic, geographic, humanitarian and logistic conditions (Keßler, 2012).

Although some of these characteristics have been touched by existing literature, insights with respect to the influence of contextual factors on outsourcing in humanitarian logistics are very limited. One neglected, but highly important dimension in this regard is the role of donors. The incentives and restrictions they impose have a huge impact on HOs (Wakolbinger and Toyasaki, 2018). For example, their requirements have to be considered with respect to the applicable procurement procedures and remuneration forms. However, there is no clear understanding of how they influence outsourcing decision-making. In general, literature has not investigated sufficiently the impact of donors on operational decisions (Burkart *et al.*, 2016). Further important aspects of the outsourcing context, which have not been researched sufficiently to date, are the role of outsourcing during the preparedness phase (Jahre *et al.*, 2016) and the feasibility of outsourcing in armed conflicts (Heaslip and Barber, 2014). Therefore, we propose the following research question:

RQ8. How do contextual factors impact the suitability and success of outsourcing in humanitarian logistics?

To evaluate the interplay between donors and aid agencies, game-theoretic models would be a good methodological fit. They allow for the modeling of individual actors' incentives. Analyzing equilibrium conditions, for example, by applying variational inequalities (Nagurney, 2013), would allow to investigate the situation from the perspective of policy-makers. In addition, an exploratory cross-case analysis of outsourcing engagements under different contextual conditions could be applied in order to determine the influence of individual factors.

7. Summary

Outsourcing has great importance for humanitarian logistics because it can help to improve the efficiency and effectiveness of relief operations. At the same time, aid

agencies require guidance on how to mitigate the inherent downsides of the practice. However, the related academic literature is heavily fragmented. Publications use a variety of terms to reference the concept, for example "partnerships with LSPs", "coordination with LSPs" or "cooperation with LSPs". We conducted a structured literature review and organized the key insights from 54 peer-reviewed publications along five dimensions of a holistic framework: subject, object, partner, design and context. In addition, we conducted a Delphi study and a complementary focus group with humanitarian experts in order to reveal ten future trends for the field. Our research found that outsourcing in humanitarian logistics is very likely to increase considerably in the future, even though it is already widely practiced today. Aid agencies frequently commission commercial, humanitarian or armed service providers to execute logistics activities such as procurement, transportation and storage on their behalf. Despite this wide practice, many important questions have not been answered sufficiently to date. For example, further research is required with respect to the impact of intra-organizational, inter-organizational and contextual characteristics on the suitability of outsourcing. In addition, more research is needed regarding the design of cross-sectoral outsourcing engagements and with respect to cooperative outsourcing initiatives of aid agencies. In addressing these topics, research should broaden the empirical base of the field and contribute more explanatory and prescriptive models.

Notes

1. Science Direct, Emerald, Wiley and Web of Science.
2. E22 refers to Expert 22 (see Table 3 in the Appendix). Any adjustments to direct quotes from experts are highlighted using squared brackets.

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Appendix 1

Delphi method – Selection criteria and research design

This section provides further background on the two rounds of the Delphi study and on the complimentary focus group. Please refer to Gossler *et al.* (2019a) for a detailed explanation of the recruitment and composition of the expert panel.

We designed the study to consist of two rounds, since this approach was recognized to best balance participant fatigue and result accuracy (Hasson *et al.*, 2000; Woudenberg, 1991). All 31 experts participated in Round 1, which was a qualitative online survey asking experts to name potential developments with respect to outsourcing in humanitarian logistics over the next five to ten years. Before releasing the questionnaire to the panel, we pre-tested it with selected practitioners. We analyzed the responses of the first survey based on the principles of content analysis in NVivo. By summarizing, explicating and structuring the responses of participants according to rules of procedure (Mayring, 2000, 1991), we identified ten trends which were mentioned by at least one expert.

For validating and quantifying the findings from the first round, we fed the anonymized results back to the expert panel as part of a rather quantitative second online survey, which was pre-tested as well. 27 experts participated in this survey (87% response rate). These were asked to rate the estimated likelihood of each of the ten trends on a 4-point Likert scale. Moreover, they had the possibility to reason their judgment in an open text field. Analyzing the responses of the second round, we calculated the mean rating of all trends and determined the level of consensus among the 27 panelists. We identified items lacking consensus by combining two well-established indicators: interquartile range (*IQR*) and within-group inter-rater reliability statistic r_{wg}. *IQR* measures the difference between the lower and upper quartiles. r_{wg} is a measure of inter-rater agreement (James *et al.*, 1993). Following the recommendations from Raskin (1994), Rayens and Hahn (2000), and LeBreton and Senter (2008), we marked all items with $IQR > 1$ or $r_{wg} \leq 0.30$ as "lacking consensus." While panelists agreed on the likelihood of seven trends, they lacked consensus on three.

Finally, we discussed all trends in depth during the face-to-face focus group (Bürki, 2000; Kitzinger, 1995; Morgan, 1996). Five respondents of the second survey and five substitutes of earlier respondents participated in the focus group. The new participants allowed us to reflect on the findings from an outside perspective and to incorporate new viewpoints into the results. Furthermore, we invited two representatives of commercial LSPs to the focus group in order to mirror the perspective of aid agencies' in controversial discussions. The research team first presented the results from the two online surveys. Afterwards, discussions took place among the experts. A member of the research team facilitated the discussions, summarized them, and asked participants for validation or corrections. The focus group was audio-recorded, transcribed word-for-word and, afterwards, content-analyzed in NVivo. Debating all items in a controversial, face-to-face discussion with selected experts allowed us to take a deep dive into the underlying assumptions and contextual relationships (Rowe and Wright, 2011; Van de Linde and Van der Duin, 2011). Moreover, it enabled us to identify reasons for the lack of consensus on three of the trends.

Appendix 2

Participants of Delphi panel

ID	Current job title	Experience in humanitarian logistics	Focus of experience (headquarters/field)	Participation (e-Delphi/focus group [FG])
Expert 1 (E1)	Deputy Head of Procurement and Logistics	14 yrs	HQ and field	e-Delphi
Expert 2 (E2)	Global Logistics Advisor	18 yrs	HQ and field	e-Delphi
Expert 3 (E3)	Administrator Department of Operations	4 yrs	HQ and field	e-Delphi and FG
Expert 4 (E4)	Deputy Logistics Director	12 yrs	HQ and field	e-Delphi
Expert 5 (E5)	Head of Supply Chain	10 yrs	HQ and field	FG
Expert 6 (E6)	Supply Chain Manager	17 yrs	HQ and field	e-Delphi and FG
Expert 7 (E7)	Senior Program Officer	15 yrs	field	e-Delphi
Expert 8 (E8)	Head of Private Sector Partnerships	10 yrs	HQ and field	FG
Expert 9 (E9)	Supply Chain Director	3 yrs	N/a	e-Delphi
Expert 10 (E10)	Head of Transport	16 yrs	HQ	e-Delphi
Expert 11 (E11)	Head of Procurement and Logistics	10 yrs	HQ and field	e-Delphi and FG
Expert 12 (E12)	Manager, Purchasing and Logistics	14 yrs	HQ	FG
Expert 13 (E13)	Solution development manager in international logistics	4 yrs	N/a	FG
Expert 14 (E14)	MGR Private Sector Partnerships	2 yrs	N/a	FG
Expert 15 (E15)	Technical Referent Log. Platform	8 yrs	Field	e-Delphi
Expert 16 (E16)	Operational Management and Logistics Trainer	20 yrs	HQ and field	e-Delphi and FG
Expert 17 (E17)	Project Manager	13 yrs	HQ and field	e-Delphi
Expert 18 (E18)	Head of Procurement and Logistics	17 yrs	HQ and field	e-Delphi
Expert 19 (E19)	Procurement Officer	7 yrs	HQ and field	e-Delphi
Expert 20 (E20)	Head of Aid and Relief for IMEA	8 yrs	N/a	FG
Expert 21 (E21)	Global Supply Chain Management Officer	4 yrs	HQ and field	e-Delphi
Expert 22 (E22)	Human Rights Officer	7 years	HQ and field	e-Delphi
Expert 23 (E23)	Operational Logistics – Head of Service	20 yrs	HQ and field	e-Delphi

Table A1.
Participants of Delphi study and focus group

(*continued*)

ID	Current job title	Experience in humanitarian logistics	Focus of experience (headquarters/field)	Participation (e-Delphi/focus group [FG])
Expert 24 (E24)	Director, Supply Chain Management	10 yrs	HQ and field	e-Delphi
Expert 25 (E25)	Senior Advisor for Logistics	25 yrs	HQ and field	FG
Expert 26 (E26)	Chief Vendor Management and Supply	25 yrs	HQ and field	e-Delphi
Expert 27 (E27)	Chief of Air Operations	22 yrs	HQ	e-Delphi
Expert 28 (E28)	Global Lead for Emergency Logistics	20 yrs	HQ and field	e-Delphi
Expert 29 (E29)	Program Assistant – Emergency Logistics	2 yrs	HQ	e-Delphi
Expert 30 (E30)	Project Manager	15 yrs	HQ	e-Delphi
Expert 31 (E31)	Finance Advisor	15 yrs	Field	e-Delphi
Expert 32 (E32)	Head of Procurement and Logistics	6 yrs	HQ and field	e-Delphi
Expert 33 (E33)	Senior Supply and Logistics Advisor	12 yrs	HQ and field	e-Delphi
Expert 34 (E34)	Head of Supply and Logistics	13 yrs	HQ and field	e-Delphi
Expert 35 (E35)	Reg. Director for Emergency Programs	15 yrs	Field	e-Delphi and FG
Expert 36 (E36)	Procurement Coordinator	18 yrs	HQ	e-Delphi
Expert 37 (E37)	Logistics Advisor	4 yrs	HQ	e-Delphi
Expert 38 (E38)	Procurement and Logistics Manager	10 yrs	HQ and field	e-Delphi

Table A1.

Name of organization	Number of participants in e-Delphi	Number of participants in FG	Country of residency of participants
Austrian Red Cross	1	1	Austria
Canadian Red Cross	1	–	Canada
Caritas International	1	–	Austria
Danish Refugee Council	4	1	Denmark, South Sudan
Diakonie Disaster Relief	1	–	Germany
Gates Foundation	1	–	USA
Globale Verantwortung		1	Austria
Handicap International	1	–	France
ICRC		–	Switzerland
IFRC	1	–	Switzerland
International Medical Corps	1	1	USA, Croatia
Islamic Relief Worldwide	1	1	Turkey
Lutheran World Relief	1	–	USA
Medicines Sans Frontieres		1	France, Switzerland
Oxfam Global	1	–	UK
Oxfam UK	1	–	UK
Oxfam Spain	1	–	Spain
People in Need (PIN)	1	1	Czech Republic
Samaritan Austria	1	1	Austria
UN Mission in South Sudan	1	–	South Sudan
UNHCR	1	–	Hungary
Welthungerhilfe	1	–	Germany
WFP/Logistics Cluster	1	1	Italy, Denmark
World Vision Australia	1	–	Australia
World Vision Germany	1	1	Germany
Damco	–	1	UK
Kuehne + Nagel	–	1	UAE

Table A2.
Organizations of participants

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