Review

Procurement in humanitarian organizations: Body of knowledge and practitioner’s challenges

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1. Introduction

Humanitarian organizations (HOs) routinely strive to alleviate human suffering through disaster relief operations and development aid programs. HOs’ key competencies include their ability to rapidly identify needs and engage in fundraising, procuring, transporting, distributing, and delivering products and services to people in need. Procurement of products (e.g., medicines, food, or non-food-items) and services (e.g., transportation, warehousing, and data collection and analysis) is a critical activity for HOs. Falasca and Zobel (2011) report that about 65% of HOs’ expenditures are related to procurement activities, with 15% allocated to transportation, 10% to personnel, and 10% to administration. These are sizable quantities considering that international humanitarian assistance was over USD 22 billion in 2018 (GHA, 2019). For instance, in 2018, the United Nations Children’s Fund (UNICEF) alone procured USD 3.5 billion in supplies and services for operations in 150 countries and regions out of its annual budget of USD 5.2 billion (UNICEF, 2018). That is, procurement accounted for 67% of UNICEF’s total budget in 2018. In the same year, the Danish Refugee Council (DRC) spent 82% of its budget in procurement, that is, USD 378.2 million of its USD 460.4 million annual budget in 2018 (DRC, 2018).

HOs’ procurement efforts include pre-positioning supplies procured in advance of a disaster and procurement of additional supplies immediately after the disaster. A disaster creates a huge sudden demand spike for specific goods. If HOs fail to procure efficiently and effectively, the needs of affected people may not be met. There may be a number of reasons HOs may struggle to procure items effectively, such as not having the flexibility to adapt to constantly changing needs and circumstances, facing delays, acquiring expensive products or services, receiving low-quality products, facing procurement fraud, and having limited budgets. HOs’ failure to procure the required products can lead to frustration among beneficiaries and loss of trust among donors. Moreover, HOs have recently been experiencing reductions in their budgets as large donors like the United States, Germany and the United Kingdom reduce their humanitarian spending (GHA, 2019).

HOs must follow strict ethical guidelines, allowing them to practice accountability, equality, non-discrimination, and transparency. However, while trying to balance the demands of policymakers, governments, private donors, and beneficiaries, their operations can become cumbersome and bureaucratic. Services must meet an acceptable level of quality and be delivered in a timely manner to the right people.
Donations should be used efficiently by optimizing value for money and reducing risk in procurement decisions. However, donors frequently earmark their donations by placing constraints on how their money can be spent. For example, a donor may only want to fund a specific project, projects in a specific country, or projects that follow the plans of a specific political party (Telgen et al., 2007). Procurement decisions can involve not only securing products or services for a population but also function as a policy tool to stimulate innovation, provide opportunities for small- and medium-sized enterprises, promote sustainable practices, support the local economy, and decrease unemployment, especially among women and disabled people (Granda and Meehan, 2017).

In addition, HOs deal with high levels of complexity and uncertainty in supply and demand levels. For instance, the infrastructure required to meet the needs of an affected population may be damaged (Van Wassenhove, 2006), information on locally available supplies may not be immediately available (Altay, 2008), increased demand causes local prices to surge (Eftekhari and Webster, 2020). In these urgent and challenging settings, HOs commonly prioritize effectiveness (e.g., agile procurement with short lead times) over efficiency (e.g., procurement ensuring cost minimization). These distinctions are sharper among HOs that provide disaster relief services than those undertaking development aid programs, and thus have an ongoing relationship with suppliers.

Etem and Buyurgan (2013) and Balik and Ak (2014) were among the first to reveal the limited research into HO procurement and to call for more studies on this topic. Recent years have witnessed an increase in the number of studies, but even this progress is not consistent with the strategic role that procurement plays in humanitarian supply chain management. The paucity of research and the need for greater scholarly attention have been emphasized in recent studies by Jahre (2017) and Torabi et al. (2018). Analyzing 37 literature review papers that address humanitarian logistics and supply chain management, Kovacs and Moshtari (2019) found that none focus on procurement and purchasing in humanitarian settings. Given the strategic role procurement plays in humanitarian supply chains, it is important to understand the lingering research gaps on this topic.

To inspire and inform new research, the present study provides an overview of existing studies on humanitarian procurement from multiple angles, including procurement tasks, research problems/questions, data collected, and methods used. It also describes real practices and their associated challenges in humanitarian procurement and suggests avenues for future research. We aim to answer the following research questions:

- Which topics have already been explored on procurement in humanitarian operations?
- What challenges are encountered by humanitarian practitioners when making procurement decisions and implementing the associated practices?

To answer the questions above, we use two complementary methods in this study. First, we examine peer-reviewed research papers on humanitarian procurement that have adopted conceptual, empirical, or analytical modeling methods. Next, we complement our literature review with a discussion of the actual practices and their associated challenges from the perspectives of HOs and the companies that supply them. In this vein, we interview 39 practitioners from HOs and their direct suppliers, and analyze the data collected.

This paper is organized as follows. In section 2, we explain how we define procurement and describe the procedures followed in reviewing the literature, and collecting and analyzing the interview data. In sections 3 and 4, we present the results of the literature review and discuss the real practices and their associated challenges. In the final section, we conclude the paper with some remarks and recommendations for researchers in humanitarian operations.

2. Methodology

2.1. Procurement defined

Van Weele (2018) defines procurement as a set of tasks that includes communication and collaboration with internal buyers (i.e., other departments), determining the specifications of a required product or service, sourcing (i.e., sourcing strategy, searching for, selecting, and setting contracts with suppliers), obtaining materials or services (i.e., ordering and buying from suppliers, expediting and following up, evaluating products, and supplier performance), and managing relationships with suppliers. The objectives of procurement include (i) ensuring the timely and uninterrupted availability of goods and services at an acceptable level of quality while controlling the total cost of ownership and (ii) reducing the organization’s risk exposure in supply markets while contributing to the organization’s strategic goals by engaging suppliers in product and process development and sustainability practices.

We group procurement tasks into two categories: primary and secondary (see Table 1). Primary tasks are directly related to the procurement process and involve spend analysis, sourcing strategy, supplier selection, and contract design. Support tasks are those activities that provide the infrastructure and inputs that allow primary activities to take place. They include purchasing organization, procurement objectives, policies and processes, and inter-organizational relationships (Bals et al. (2019); Monczka et al. (2015)). We use this framework to provide a structure to the literature review and quotes from practitioners.

2.2. Literature review and interviews with HOs and suppliers

In preparation for the literature review, the following search procedure was followed (Tranfield et al., 2003). All academic papers published between 2004 and 2019 were included. We conducted our search using three bibliographical databases: ABI/INFORM ProQuest, Web of Science, and Scopus. In the first stage, we searched for the terms “humanitarian,” OR “disast*,” OR “relief,” AND “procur*,” OR “purchas*,” OR “buy*,” OR “sourcing” in the “title,” “abstract,” and “keyword” fields. This search gave 1577 results (166 in ABI/INFORM ProQuest, 781 in Web of Science, and 630 in Scopus). We focused on peer-reviewed articles and excluded conference proceedings, textbooks, and papers not published in English.

Our objective was to open the widest possible vista on procurement research associated with all phases of humanitarian operations (i.e., mitigation, preparedness, response and recovery). Therefore, we did not analyze the contents of individual articles but focused on certain general aspects to assess the literature and provide a broad perspective of studies on humanitarian procurement (Gupta et al., 2016). The nature of procurement management is multidisciplinary, meaning that it connects to different fields like decision-making models, supply chain management, operations management, organization studies, marketing, finance, law, and public administration (Wynstra et al., 2019). Therefore, we did not limit the scope of our search solely to operations and supply chain management literature and included journals in all management and economics fields.

In the second stage, results were downloaded into RefWorks software and analyzed to exclude less relevant citations. First, we removed 430

Table 1

| Primary activities                        | Support activities                        |
|------------------------------------------|------------------------------------------|
| 1. Spend analysis                        | 1. Purchasing organization               |
| 2. Sourcing strategy                     | 2. Procurement objectives and policies    |
| 3. Supplier search and selection         | 3. Procurement processes                  |
| 4. Contract design and awarding          | 4. Inter-organizational relationships     |
duplicate citations, which decreased the total to 1147 studies. Next, we carefully reviewed the titles of the papers and, when necessary, their abstracts, to identify studies in which procurement is the main focus (Pittaway et al., 2004). We excluded papers that do not explore procurement in humanitarian settings. Thus, papers concerning insurance, marketing, and procurement and risk management in the commercial sector were excluded. This left us with 332 relevant papers. In the third stage, we studied the full text of those 332 papers to identify the most relevant citations. Besides checking the previous exclusion criteria in detail, we selected papers that investigate the primary or supporting tasks of procurement that directly influence the procurement process. We excluded papers where procurement is not the main focus, or is only tangentially covered as a component of inventory management or distribution models. These steps led to selecting 51 highly relevant papers; 31 were related to primary activities and 20 to support activities. The full count of papers reviewed in each journal is available in Appendix A.

As secondary sources of data, we also reviewed relevant public reports and information posted on HO websites.

To complement the insights generated from the literature review with the views of practitioners, we interviewed 17 humanitarian professionals who participated in an executive training course on procurement, and 22 managers from supplier firms that participated in the Aïdex (2019) Exhibition. Aïdex is the world’s largest annual event for aid and development. For more information, please see Aïdex (2019) and Appendix B. The semi-structured questionnaire is presented in Appendix C. This part of the paper was exploratory and undertaken to provide a current and actual list of procurement practices and challenges. Then, building on these reported challenges and our observations from the literature review; we suggest avenues for future studies. We did not aim to perform a cross-interviewee analysis in this study. In addition, our interviewees are affiliated with organizations with different sizes and range of resources, and operate in different regions of the world. We admit that the identified challenges are based on the experience of our interviewees and do not cover all potential challenges in humanitarian procurement. This is a limitation of our study.

In the next two sections, we report the results of our literature review and augment them with insights from practitioner interviews and data from secondary sources.

3. Data analysis I: primary activities

Following the categories described in Table 2, we found 31 papers that examined the primary activities in humanitarian procurement. We categorized these papers based on their coverage of (i) spend analysis, (ii) sourcing strategy, (iii) supplier selection, and (iv) contract design. Scholars used various empirical and analytical modeling methods, primary and secondary data and, in some papers, hypothetical data (see Table 2).

3.1. Spend analysis

In spend analysis an organization’s expenditure data are collected, cleaned, classified, and analyzed from different angles: what is being spent, how often, and for what? Are cost goals being met? (Pandit and Marmaris, 2008). It enables organizations to understand the structure of their expenses and identify opportunities to improve purchasing plans. It also enables organizations to perform data-driven sourcing, increase the visibility and transparency of expenditures for donors and decision makers, manage risks, and benchmark their performance.

Five papers examine spend analysis in the humanitarian context. Eftekhar et al. (2014) refer to the importance of cost-saving practices in fleet management for HOs, especially when decisions are made at the aggregate level. They use linear programming and quadratic control models to identify optimal vehicle procurement policies for development programs. Rancourt et al. (2014) focus on freight transportation in Africa. Their study reveals that road conditions and competition levels are the two most significant factors influencing transportation tariffs in Ethiopia and discusses their relative importance. To this end, they assess the dataset of contracts between the World Food Program (WFP) and its carriers, and suggest managerial implications for shippers, carriers, and governments. Lentz et al. (2013) compare the outcomes of local and international procurement policies used in US-funded non-governmental organizations (NGOs) in nine countries. They analyze data across commodities like grains and cereals to examine the outcomes of time-lines and cost-effectiveness measures. In a similar study, Ozpilat et al. (2015) compare two procurement policies: the recipient country approach practiced by the UN and the EU, and the recipient country approach endorsed by the US. The study reveals that neither strategy is optimal and proposes a flexible, mixed-strategy approach. The last study by Battista Hesse et al. (2019) creates a set of measures to classify the nutrient density of foods to assist sourcing decision at food banks.

The research above suggests that the limited work in spend analysis focuses on comparing different types of procurement policies (e.g., local vs. international, EU vs. USA practices), identification of important factors (e.g., road conditions, vendor competition, item characteristics), and optimal fleet procurement policies. Overall, these studies use either secondary data or organizational data recorded in internal information systems. Given the financial constraints of HOs, studies analyzing spend data can benefit donors and help HOs understand potential savings in their budgets, formulate better sourcing strategies, and effectively manage relationships with suppliers.

In the past, accessing accurate and reliable spend data has been difficult. Our interviews revealed that HOs have begun deploying digital solutions in procurement. These solutions systematically record spending and supplier data. This surely will facilitate future spend analysis research. For example, Médecins Sans Frontières (MSF) uses the UNFIELD software to manage their supply chain and procurement processes. The software has a global database that maintains historical data on suppliers and products. Collaboration between researchers and practitioners can lead to opportunities for developing and testing novel models or theoretical frameworks using this data.

3.2. Sourcing strategy

Sourcing strategy depends on the importance of purchasing for the organization and the complexity of the supply market (Kraljic, 1983). Building on the works of Hesping and Schiele (2015), González-Benito (2007), Baier et al. (2008) and González-Benito et al. (2010), we identify five hierarchical stages of sourcing strategy: (1) Organization strategy; (2) Purchasing strategy as a functional strategy; (3) Category strategies for the multitude of supply markets; (4) Effectuation by a set of tactical sourcing levers; and (5) Strategies for each supplier within a sourcing category. When creating strategies according to different supply segments, Hesping and Schiele (2015) emphasize the importance of purchasing categories, the sourcing levers to be adopted according to those category characteristics, and supplier strategies. For example, different competitive or cooperative sourcing strategies can be used in different sourcing situations (e.g. single or multiple sourcing, demand pooling, price evaluation, process improvement and supplier relationship intensification). In the context of humanitarian procurement, HOs can decide to use a mix of pre-positioning, spot purchasing, or framework agreements to streamline procurement of relief items. They may procure products and services from either international or local suppliers and choose single or multiple suppliers for the same product.

Sourcing strategies depend on the nature of the crisis (e.g., slow or rapid onset disasters, armed conflicts etc.), the products, the type, capacity, objectives of the HO, and funding status. Donors may also impose restrictions on procurement practices. Another influencing factor is the HO’s policy on building local capacity or strengthening developing economies. For example, Oxfam sources nearly all its relief supplies from sources in Africa, but most of World Vision International’s supply base is in Asian countries (Charles et al., 2016).
Table 2
An overview of studies on primary procurement activities.

| Procurement activity | Study | Key focus | Type of study | Data | Case information |
|----------------------|-------|-----------|---------------|------|------------------|
| Spend analysis       | Eftekhar et al. (2014) | Identifying optimal vehicle procurement policies | Analytical modeling (linear programming and quadratic control) | Field data | IRCC in Sudan, Afghanistan, and Ethiopia |
|                      | Lentz et al. (2013) | Comparing timeliness and cost-effectiveness of local and regional procurement against in-kind international procurement | Descriptive statistics | Field data | US-funded local and international procurement by NGOs in nine countries |
|                      | Orzolut et al. (2015) | Examining sourcing of food aid, comparing the approaches promoted by the US with those of the UN and the EU | Comparative case analysis | Secondary data | USAID, FAO, and US Transportation Statistics reports |
|                      | Rancourt et al. (2014) | Identifying the determinants of transportation tariffs in Ethiopia and quantifying their relative importance | Econometric model | Field data | WFP in Ethiopia |
|                      | Battista Hense et al. (2019) | Understanding the application of nutritional quality in a food bank setting | Exploratory | Secondary data | USDA |
| Sourcing strategy    | Falasca and Zobal (2011) | Introducing a two-stage model for humanitarian procurement | Analytical modeling (stochastic decision model) | Illustrative example | |
|                      | Iakovou et al. (2014) | Quantifying the impact of emergency sourcing on the performance of humanitarian supply chains | Analytical modeling (discrete event simulation) | Numerical experiments | |
|                      | Matopoulos et al. (2014) | Understanding the benefits and risks of local sourcing in post-disaster housing reconstruction | Theory elaboration study | Secondary data | Archived reports by European Agency of Reconstruction |
|                      | Piotrowsicz (2018) | Understanding benefits and limitations of three support modes: in-kind donations, cash-based assistance, and local procurement | Exploratory | Interviews and secondary data | Case study of Ukrainian crisis |
|                      | Celentanoa et al. (2019) | Understanding the impact of material choice on post-disaster shelter delivery | Analytical modeling (mathematical model) | Secondary data | IFRC in the Nepal earthquake |
|                      | Baghi et al. (2011) | Determining the optimal auction mechanism to minimize gaming between suppliers | Numerical experiments | | |
|                      | Trextrall et al. (2009) | Suggesting a decision tool to approximate future USDA bid awards | Analytical modeling (mixed-integer program) | Field data | USDA |
|                      | Etrem et al. (2010) | Presenting a holistic and reconfigurable procurement auction framework | Analytical modeling (integer programming) | Numerical experiments | |
|                      | Etrem and Buyurgan (2011) | Proposing an auction-based framework for procurement of goods | Analytical modeling (integer programming) | Numerical experiments | |
|                      | Etrem et al. (2012) | Identifying the design parameters for an effective procurement auction | Analytical modeling (integer programming) | Numerical experiments | |
|                      | Venkatesh et al. (2019) | Introducing a supplier selection framework for continuous aid procurement | Analytical modeling (AHP and TOPSIS) | Literature, expert views, case study | NGO in India |
|                      | Balcik and Ak (2014) | Developing a model to select framework agreement suppliers | Analytical modeling (stochastic programming) | Numerical experiments | Turkish Red Crescent (Historical data) |
|                      | Shokr and Torabi (2017) | Suggesting reverse auction framework using possibilistic models | Analytical modeling (mixed integer programming) | Numerical example | Iranian Red Crescent Society |
|                      | Lauton et al. (2019) | Presenting an integrated approach to evaluate competition benefits and supply risks of new entrant manufacturer | Analytical modeling (mathematical model) | Simulation using secondary data | Depot medroxyprogesterone acetate procured by UNFPA and USAID |
|                      | Aghaian and Torabi (2019) | Suggesting a multi-attribute combinatorial reverse auction model | Analytical modeling (mixed-integer programming, multi-attribute combinatorial auction) | Numerical experiment | Iranian Red Crescent Society |
|                      | Kim et al. (2019) | Identifying the criteria and factors involved in prioritizing and selecting logistics service providers | Multi-criteria decision-making model | Expert opinions | A leading HO in India |
| Supplier selection   | Liang et al. (2012) | Introducing option contract in relief supply chain management | Analytical modeling (option pricing) | Numerical example | |
|                      | Hu et al. (2019) | Introducing put option contract | Analytical modeling | Numerical example | |
|                      | Shamsi et al. (2018) | Suggesting an option contract and a hybrid solution procedure for vaccine procurement | Analytical modeling | Numerical example | |
|                      | Torabi et al. (2018) | Proposing a two-stage model for integrated relief pre-positioning and procurement planning based on a quantity flexibility contract | Analytical modeling (fuzzy stochastic programming) | Numerical experiments | |
|                      | Nikkhoo et al. (2018) | Utilizing a quantity flexibility contract to coordinate ordering activities | Mathematical model | Numerical example | |
|                      | Zhang et al. (2019) | Analytical modeling the recycling, replenishment, and payment strategies within a quantity commitment contract | Mathematical model | Numerical example | |
| Contract design      | Wang et al. (2015) | Analytical modeling | | | (continued on next page)
We again identified five studies. Falasca and Zobel (2011) are among the first to model the procurement process in the humanitarian context. Their model suggests a two-stage plan to order optimal quantities of relief items subject to multiple uncertainties in donations and logistics. Contributing to the discussion on dual sourcing in humanitarian operations, Jakouva et al. (2014) explore the use of emergency sourcing. They develop a decision model to help practitioners choose whether to use alternative suppliers and, if they do, how to determine the optimal capacity to reserve and its associated premium. Matopoulos et al. (2014) use field data from reconstruction programs in Kosovo and the Former Yugoslav Republic of Macedonia to explore the benefits and challenges of local sourcing in humanitarian supply chains. Similarly, Piotrowicz (2018) focuses on the Ukrainian crisis as a complex emergency and qualitatively explores three types of sourcing decisions: in-kind donations, cash transfer programs, and local procurement. His study discusses the advantages and limitations of each approach given the characteristics of the country and its specific crisis. Finally, Celentano et al. (2019) explore the influence of local and global sourcing strategies on the speed of shelter delivery after the 2015 Nepal earthquake.

Research on sourcing strategies focuses on comparing different types of sourcing strategies (e.g., in-kind donations vs. cash transfers, local vs. global procurement, standard vs. emergency), and benefits/challenges and impacts of these strategies. Much of it is motivated by specific cases (e.g., sourcing in Kosovo, Macedonia, Nepal, Ukraine) and informed by real data. Optimal sourcing strategies under uncertainty has also been considered. However, research on sourcing strategies does not explicitly discuss the hierarchical nature of these strategies and the relationship between different stages, as is the case in contemporary purchasing research in the commercial context (González-Benito, 2007; Baier et al., 2008; González-Benito et al., 2010; Hesping and Schiele, 2015).

Our interviews provide practical insights that complement those captured in the published research. One interviewee (HO14) points to changing procurement trends in the aid sector that create more opportunities for local enterprises to participate, thus supporting local economies and boosting local market capacity and job growth. This also lessens the dependence of developing countries on international aid. Aid organizations recommend procuring locally rather than importing relief goods, if possible. Doing so can reduce costs for the aid organization, encourage regional trade, and improve the skills and expertise of the local workforce (Matopoulos et al., 2014; Piotrowicz, 2018).

Although there is an increasing propensity towards aid localization and local sourcing, our interviewees highlight the challenges and risks associated with local procurement. Challenges include lower than acceptable quality levels, and limited production and warehousing capacities (HO10). Therefore, purchase orders are often split among multiple suppliers, but the product quality and lead-times vary among them (HO13). Risks include security challenges, armed conflicts (HO4), and corruption, especially in places where emergency procurement is enforced, and a complete tendering process is not undertaken (HO13). According to African Union estimates, African countries lose about 25% of their GDP to fraud and corruption practices (Gumede, 2016). Another challenge involves the professional capacity of local suppliers. An interviewee stated:

“It is usually very hard to find vendors that comply with your requirements or understand the need for such requirements. They cannot fill out forms, provide details of what they offer, or simply submit their quotes on time. We usually spend a lot of time building on the capacities of these vendors in localities for them to understand and then provide the basic paperwork” (HO4).

As observed by prior studies and revealed in our interviews, international and local sourcing strategies both have advantages and disadvantages. Future studies may investigate empirically and theoretically the contingencies that influence adoption of local and international sourcing practices and their short- and long-term impacts on the affected region and HOs. In addition, researchers may examine the right balance of local and international sourcing, to avoid overreliance on international suppliers while developing local suppliers.

### 3.3. Supplier selection

In supplier selection, HOs investigate potential suppliers to determine whether they are qualified to receive a request for information (RFI), for proposals (RFP), or for quotes (RFQ). Price, quality, and lead-time are among common supplier selection criteria shared with the commercial sector (Logistics Cluster, 2019). In addition, HOs consider other factors like international trade knowledge, previous record of service and performance, production capacity, and stock availability. HOs also must follow strict policies on sustainability practices, anti-terrorism laws, and debarment listings.

The largest number of identified papers, 11 papers, focus on supplier selection. A group of papers focuses on supplier selection criteria and weighting methods. For example, Venkatash et al. (2019) propose a multi-criteria decision-making model (MCDM) using Analytical Hierachy Process (AHP) and Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) in order to assist HOs in selecting suppliers for development aid programs. Their model, built on literature and input from eight humanitarian practitioners, includes six categories that have 24 criteria in total. In a similar study, Kim et al. (2019) apply two MCDM techniques and suggest a set of factors to rank and select logistics service providers.

Balcik and Ak (2014) model quantity framework agreements within supplier selection. Once an agreement is signed, HOs commit to procure a minimum number of products or services from the supplier over a

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1. References to interviewees take the form HON, where N is the number assigned to a specific organization. Similarly, references to supplier informants take the form SN, where N is the number assigned to a specific supplier.
specification of the period, and the supplier promises to provide those products or services according to the agreement terms. The authors argue that a quality framework agreement enables HOs to “streamline the procurement process and guarantee the availability, quick delivery, and cost-effective procurement of critical relief items after a disaster.” (p. 1028).

Another group of supplier selection studies focuses on the bidding process. For example, Ertem et al. (2010) model the phases of procurement auctions (i.e., announcement construction, bid development, and bid evaluation) in a humanitarian context. Ertem et al. (2011, 2012) study bidding and planning by a coordinating agent such as humanitarian procurement centers that consolidate the demands of different HOs and purchase for the group. Ertem et al. (2012) suggest that the inclusion of two options, substitution and partial fulfillment, provides an opportunity to local suppliers with limited capacity to join the auction, thus increasing the diversity and capacity of the supply base. Separately, Lauton et al. (2018) present an integrated method to evaluate the inclusion of new-entrant medicine manufacturers in terms of competition benefits and supply risk measures. The evaluation method enables large buyers like UNICEF to quantify the associated impacts of cost reduction, operational risks, and investment in building the capacity of potential entrants for them to qualify for and enter the bidding process.

Trestrail et al. (2009) propose a mixed-integer programming model based on historical United States Department of Agriculture (USDA) bidding data to assist food suppliers and logistics service providers to anticipate the level of price competition and pricing flexibility before submitting their bids. Bagchi et al. (2011) focus on the process of awarding bids to improve the effectiveness of USDA auctions. The authors explore bidders’ gaming behavior and suggest an optimal auction mechanism that minimizes gaming between suppliers, streamlines bid construction, and reduces cost. These efforts can eventually lead to increased participation in bids and greater supply capacity.

Our interviewees shared several real practices and challenges related to supplier selection criteria and process. The first point is related to the use of online platforms for supplier registration. Many HOs increasingly call for suppliers to register using online platforms. Our interviews suggest that, although electronic registration is recommended by large HOs, local suppliers with limited capacities can only register using paper forms. Therefore, communication and bidding through electronic platforms may inhibit small local suppliers to engage in the supply market. Investigating the practices or resources required to promote the adoption of online tools among local suppliers can be a valuable subject for future studies.

Once registered, suppliers are qualified based on a number of factors, including availability of documents like registration documents, company statutes, financial statements, insurance, taxpayer certificates, company profiles that include CVs of key staff, available staff and capacities, availability of certificates and licenses, reputation, and references (HO6). Other criteria include those related to antiterrorism regulations and rules of origin established by stakeholders (HO13). Some HOs use third parties to conduct the first round of background checks to determine whether a supplier is affiliated with terrorist groups, is under sanctions, or is otherwise blacklisted. Then, the HOs collect and analyze information regarding references, financial status, surge capacity availability, and certifications like ISO 9000. Depending on the product, the HO may request samples and test them to ensure they meet requirements. Occasional visits to the supplier’s production facility are part of this evaluation process.

Once qualified, suppliers mostly undergo assessments of their operations, price, technical support, delivery time, payment mode safety, environmental responsibilities (HO8), and environmental and social compliance (HO5, HO13, S4, S5). The selection criteria for each bid are based on the value of the purchase, the type of product (e.g., standard purchases versus high-tech instruments), and whether the purpose of the purchase is for an emergency or for development aid. Certain criteria are common in many tenders:

“The threshold set for each method of procurement; i.e., above USD 3,000 requires three quotations, above USD 100,000 requires semi-competitive procurement, while above USD 300,000 requires public tendering with approval required from the administrative center for processing” (HO4).

Interviewee S6 stated that the procedures for development aid programs are time-consuming and bureaucratic. It sometimes takes a year to get an RFI and 2–3 years for purchasing. For lifesaving operations, the procurement process is much shorter (2–3 months), while in emergencies, tendering is completed within 2–3 days.

Our observation from the interviews is that, in contrast to previous assumptions that post-disaster procurement is a very time-consuming process and requires a competitive bidding procedure (Ertem et al., 2010), HOs waive long bureaucratic tendering procedures for emergency procurement. Given the time pressure involved when responding to a disaster, HOs relax some of their procurement requirements and use procedures that are more flexible. For example, the tendering period is shorter, and the minimum number of candidates is lower. Eventually, the organization develops a list of potential suppliers to meet future demands, sign contracts with them long before a disaster strikes and save time. Some HOs develop long-term agreements with their suppliers. The focus is on lead-time, so tendering is carried out with a limited number of suppliers. There are time constraints in comparing total landed costs; therefore, in most scenarios the price will be high and quality low, which has implications for both budgets and the delivery of quality services to beneficiaries (HO8).

In tendering processes, an ad hoc tender evaluation committee is formed to analyze the offers and apply the optimal selection criteria. Members of the committee usually represent different units like procurement, finance, management, programming, and human resources. The idea is to bring together different perspectives on the same situation to reach an analytically sound common decision or award (HO13). For example, at the International Committee of the Red Cross (ICRC), the evaluation and validation of potential suppliers is a team effort and includes a buyer, a logistician assisted by a technician, a pharmacist, and any other relevant ICRC staff (HO12).

Supplier selection in a humanitarian setting is an established research area, but many of studies are model-driven and validated by numerical experiments. While we acknowledge the value of these studies, future studies are encouraged to have close collaboration with HOs. This would enable scholar to investigate the applicability of their models, identify adoption/implementation issues and report impact on procurement decisions. Such studies may provide insight to what extent the HOs use these decision making models in selecting suppliers.

3.4. Contract design

Depending on the needs of internal buyers and beneficiaries, organizations arrange and negotiate contracts with their short-listed suppliers. These contracts can be about the price of products or include detailed service-level agreements, such as delivery times, product testing, and maintenance plans. Payment terms include fixed price, cost-reimbursable, fixed price plus an incentive fee, or an agreement with a price adjustment. The expression “nonpayment terms” refers to, for example, the duration of the contract and the timing, frequency, and location of deliveries.

The last nine papers in Table 2 are related to contract design and suggest several contract types appropriate for humanitarian procurement (e.g., quantity flexibility contract, option contract, and fixed framework contract). Hu et al. (2019) focus on the role of the government in purchasing relief supplies and suggests a put option contract to reduce governments’ inventory risk in purchasing relief supplies while considering suppliers’ interests. Shamsi et al. (2018) model an option contract for pre-disaster vaccine procurement with one buyer and two suppliers, where one of the suppliers is an alternate. Wang et al. (2015)
discuss the advantages of option contracts and compare their overall profits with those of pre-purchasing with a buyback contract and instant purchasing with a return policy. Rabbaní et al. (2015) and Liu et al. (2019) also explore option contract design in humanitarian procurement.

HOs may purchase supplies after a disaster or decide to procure before a disaster. Pre-positioning products has advantages and disadvantages depending on operational cost, inventory cost, purchasing price, and supply scarcity. Torabi et al. (2018) offer a two-stage mathematical model integrating pre-positioning and procurement decisions using a quantity flexibility contract. Their model can be useful for HOs in identifying optimal pre-positioning amounts and post-disaster procurement quantities. In a similar study, Zhang et al. (2019) propose a contract between a governmental organization and its strategic suppliers, which integrates procurement and inventory decisions of perishables.

Wang et al. (2019) argue that, although a fixed framework agreement between the government and suppliers provides a platform to secure relief supplies before a disaster, the nature of these agreements with predetermined terms does not motivate suppliers to improve their services by, for example, lowering costs or ensuring faster delivery. Therefore, they suggest complementing fixed framework agreements with bonus contracts. Their study assesses the outcome of bonus contracts using deprivation cost, economic cost and cost-effectiveness of the relief operation.

We observe that majority of papers on contract design are not developed in collaboration with HOs and use hypothetical data. This suggests that empirically grounded models are needed. In addition, as the results of these studies are not easily generalizable, scholars need to be more transparent about the applicability of their findings to different types of HOs, products, emergency versus development operations, socioeconomic status of affected countries, and donor expectations.

Concerning contract design our interviewees referred to two types of contracts with suppliers for recurring orders: short term (less than one year) and long term (1–5 years). They also have ad hoc purchasing for special products or services. HOs like UNICEF and ICRG establish “long-term arrangements,” for which solicitation documents include description of the goods, terms of reference, and payment terms (HO9, HO14). This type of contract is established after tendering, helps organizations avoid extra tendering costs for each purchase (C3), and is nonexclusive (HO2). They are established in advance, so they save time, enhance reliability, and provide more value for money because they allow time for negotiations that can likely result in discounts and specific commitments from both parties (HO5). Long-term agreements require consensus on price and lead-time to maintain flexibility in responding to the needs of beneficiaries (S1). Some HOs seek suppliers that agree to keep stock at no cost to the HO, which is not feasible for many suppliers (S3). Suppliers guarantee that HOs are not charged more than other clients who buy the same goods and services at similar quantities under similar circumstances (HO2).

None of the studies above compares short- and long-term contracts, and analyze when a specific contract would be more appropriate. HO13 noted that long-term arrangements are usually formed for international procurement, and HO5 added that, although many contracts between HOs and suppliers are commercial in nature, some suppliers provide pro bono services to support humanitarian operations. Interviewees also noted the challenges of engaging into contracts with local suppliers. For example, in places with high market/currency fluctuation risks, suppliers are less motivated to work on a payment-upon-delivery basis (HO6) and demand payment in cash instead of bank transfers or checks (HO7).

4. Data analysis II: supporting activities

We found 20 articles that investigate some aspect of supporting activities in humanitarian procurement. We categorized papers based on: (i) Purchasing organization, (ii) Procurement objectives and policies, (iii) Procurement processes, and (iv) Inter-organizational relationships (see Table 3).

4.1. Purchasing organization

The term purchasing organization refers to how purchasing activities and competencies are arranged and structured in an organization (Carter et al., 2000). Organizational theory literature refers to two extremes of organizational structures. Decentralized purchasing means that each department in an organization makes its own purchasing decisions. Conversely, centralized purchasing involves devoting time and resources to maintaining a purchasing department that is solely responsible for making all purchasing decisions—whether tactical or strategic—for the organization. Due to the trade-off between the efficiency and control associated with centralization and the flexibility and high service levels that come with a decentralized approach (Luzzini et al., 2014), a hybrid approach that combines elements of both structures is suggested (Jahre, 2017).

We found only two papers on this topic. Kunz et al. (2015) investigate fleet management at the United Nations High Commission for Refugees (UNHCR) and show that a centralized internal leasing program at the headquarters combined with capability-building practices at local offices boost performance. Charles et al. (2016) call for research to understand the advantages and disadvantages of building local capacity versus strengthening developing economies when it comes to procuring relief items. Indeed, understanding the power and responsibility implications of delegating procurement and coordination decisions to local offices and examining their performance would be insightful. Kovacs et al. (2012) move the analysis to the individual level and develop a conceptual framework of skills needed for humanitarian logisticians by analyzing the contents of job advertisements, interviewing practitioners, and running a workshop discussion.

Our interviewees refer to multiple organizational challenges in HOs, which may provide valuable insight for future studies. Although HOs provide standardized products and services to beneficiaries (shelter, hygiene, water, and food) these products and services must be customized to some extent, depending on local cultural and dietary norms, geographic location, and poverty level. Therefore, purchasing involves creating cross-functional teams that include people from the field, logistics, and transportation groups (S7, HO3). The proper assignment of responsibilities and accountability between headquarters and local staff is not clear (S8); in some cases, many unnecessary people are involved in procurement decisions (S3) due to constant changes in the host government and the need to adjust previously agreed actions with new political players (HO6).

Purchasing structures among HOs vary considerably. The International Organization for Migration (IOM) has a decentralized procurement structure, with procurement handled independently by each country mission (HO6). Unlike the IOM, items used in MSF programs are ordered by the headquarters from European supply centers according to medical and logistics policies. Quality assurance and a lack of availability in local markets are among the reasons cited for this centralization (HO8). Product quality at MSF is safeguarded by using shared inputs from the medical and logistics technical units at the headquarters and the quality assurance department at MSF Logistique. The technical unit provides the technical specifications of the items that MSF Logistique must source (HO8). Other important criteria for procuring goods through MSF Logistique are as follows (HO8):

- Constant maintenance of emergency stocks to guarantee high responsiveness
- Speedy supply of kits and modules adapted to MSF’s emergency needs
- Significant cost reductions due to high-quantity purchases
- Availability of spare parts, accessories, and after-sale services for the supplied items.
An overview of studies on procurement support activities.

| Procurement activity | Study | Key focus | Type of study | Method/data | Case information |
|----------------------|-------|-----------|---------------|-------------|------------------|
| Purchasing organization | Kovacs et al. (2012) | Conceptual framework of skills for humanitarian logistics | Exploratory | Job advertisements, interviews, and workshop data | UNHCR |
| | Kunz et al. (2015) | The impact of adopting a centralized internal leasing program | Exploratory | Interviews and secondary data | Local government officials in and around New Orleans (Hurricane Katrina) |
| Processes | Atkinson and Sapat (2012) | The role of institutional culture and practices in local government procurement practices | Exploratory | Interviews and secondary data (procurement regulations) | Business vendors in Palm Beach County government (Hurricane Wilma) |
| | Atkinson and Sapat (2014) | The role and impact of country government policies and practices on business recovery | Theory testing | Survey and regression | |
| | Buddas (2014) | Building a bottleneck analysis framework in the preparedness stage | Exploratory | Interviews and secondary data | IFRC supply chain |
| | Pazirandeh (2011) | Developing a decision-making framework for sourcing and distribution of vaccines in developing countries | Conceptual | Literature review | |
| Objectives and policies | Siavoh et al. (2019) | Examining the influence of power bases in the purchasing decision-making process | Exploratory | Interviews | Six HOs in Nepal earthquake |
| | Walker and Harland (2006) | Factors influencing e-procurement adoption in the UN system | Exploratory | Survey, case study, and interactive workshop data | WHO, ILO, and United Nations Office of Nairobi at different levels in Taiwan |
| | Wang (2012) | The implications and possible problems and practices of open contracts | Content analysis | Primary and secondary data | |
| | Jahre (2017) | Risk mitigation strategies for HOs in the mitigation phase | Conceptual | Literature review | |
| | Postré et al. (2011) | Introducing a procurement risk assessment method for rating risks | Exploratory | Interviews and secondary data | UNDP’s AIDS, TB, and malaria programs in Kenya |
| | Hasselbalch et al. (2014) | Barriers to implementing sustainable procurement in the UN system | Exploratory | Regression analysis of survey data | UNHCR (two refugee camps in Kenya) |
| | van Kempen et al. (2017) | Conducting a life cycle sustainability analysis of sourcing scenarios in a humanitarian supply chain | Exploratory | Interviews, company records, and online databases | |
| | Wild and Zhou (2011) | A conceptual framework for collaborative ethical procurement due diligence | Exploratory | Interviews and secondary data | 11 international NGOs |
| Inter-organizational relationships | Herlin and Pazirandeh (2015) | Barriers to the success of cooperative purchasing of air and sea freight services | Exploratory | Interviews, observations, and secondary data | N/A |
| | Pazirandeh and Herlin (2014) | Impact of cooperative purchasing on buyers’ purchasing power | Exploratory | Interviews and secondary data | Four HOs |
| | Pazirandeh and Norman (2014) | The relationship between purchasing strategies by low-power buyers in vaccine supply chains | Exploratory | Interviews and secondary data | Four National HOs and UNICEF Supply Division |
| | Vaillancourt (2017) | Consolidating procurement needs | Exploratory | Interviews and secondary data | |
| | Zhang et al. (2015) | The influence of public-private-people partnerships on sustainability and better monetary value for post-disaster infrastructure projects | Exploratory | Interviews, survey, and focus group | HOs in the 2008 Sichuan earthquake |
| | da Silva Lamenza et al. (2019) | Developing a humanitarian purchasing matrix to guide purchasing strategies for relief items | Conceptual | Literature review and AHP | Illustrative example (a government organization in Brazil) |

Note: IFRC: International Federation of Red Cross and Red Crescent Societies; ILO: International Labour Organization; UNDP: United Nations Development Programme; UNHCR: United Nations High Commission for Refugees; WHO: World Health Organization.

Separately, UNICEF, with a centralized procurement division, aims to ensure global availability of essential supplies by influencing markets for lifesaving commodities like vaccines, essential medicines, and health products, and implementing a range of supply chain models to guarantee delivery of these supplies to children in need (HO9). HO9 described their procurement structure as follows:

‘‘[The] UNICEF Supply Division is responsible to oversee UNICEF’s global procurement and logistics operation by maintaining the highest ethical standards, providing technical support to UNICEF Country Offices and Procurement Services partners globally. Supply Division’s role is also to share procurement know-how with development partners and work on innovation to find ever-better supply solutions for children around the world. Each sector (commodity group) oversees its procurement assessments related to products and services, and potential suppliers, and the contracting center is responsible for the policies and contracts review’’ (HO9).

As these examples show, our interviews reveal that purchasing structures among HOs vary considerably. However, these differences and their associated contingencies are yet to be studied in depth. Factors such as HO size, product value and type, size of potential savings from centralization, level of procurement expertise, and the desired responsiveness to customer demands can all affect organizational structure in different ways. In addition, the impact of procurement risks like corruption, lack of information about local supply markets, and poor accountability between local and centralized decision makers (HO3) must be carefully studied. Richter et al. (2019) highlight the influence of the institutional context on the purchasing organization. Furthermore, given the critical nature of lead-time in humanitarian procurement, understanding the relationship between purchasing organization and decision speed has great value (Kaufmann and Gaeckler, 2015).

Another suggestion for further study is to investigate the specific managerial skills and competencies required for the development and implementation of procurement strategies in HOs. Examples include establishing long-term contracts with preferred suppliers, outsourcing of activities or functions, tactical decisions such as selecting and contracting suppliers, and operational decisions such as expediting activities related to released orders, invoice verification, and payment. Some
HOS prefer applicants to have specialized accreditations or certifications like Certified Professional in Supply Management (CPSM), Chartered Institute of Procurement and Supply (CIPS), and Certified Professional Purchasing Manager (CPPM) and demonstrate knowledge of the procurement and logistics guidelines of the main institutional donors.

4.2. Procurement objectives and policies

Three papers in our review explore sustainability policies and practices in humanitarian procurement. Hasselbalch et al. (2014) examine the barriers to implementing sustainable procurement in the UN system. van Kempen et al. (2017) conduct a life cycle sustainability analysis of sourcing scenarios in a humanitarian supply chain, while Wild and Zhou (2011) offer a conceptual framework for collaborative ethical procurement due diligence and highlight the critical role of donor requirements in specifying supplier selection criteria and prioritizing sourcing from the donor country or region.

In a commercial supply chain, the key purchasing performance objectives are cost, lead-time, quality, flexibility, innovation, and sustainability (Caniatö et al., 2012). However, what may be good practice in a for-profit organization may not always be clearly applicable or readily transferrable to HOS, especially when operational objectives for HOS change between different humanitarian operations (i.e., emergency response versus development aid) and their various phases (i.e. mitigation, preparedness, response, recovery). How HOS balance competing policy objectives like simultaneously achieving value for money and social and economic reform is a promising and important avenue for further research. For example, the procurement activity of goods and services at the ICRC aims to achieve the best possible value for money. It focuses on quality, lead-time, cost, and security within the ICRC contexts (HO12). All actions related to procurement must be impartial, unbiased, and aimed at serving the best interests of the ICRC. Another interviewee cited savings and simplicity as two other elements of effective procurement (HO7). Interviewee HO13 emphasized that to ensure that life-saving operations were not hampered by procurement delays they hastily purchased items when their emergency operation first started. In time, once operations were in full gear, they began working with suppliers to motivate them to improve their supply chains. The HO decided to work with its suppliers to help them develop and improve their performance, which would eventually encourage sustainability in operations. Firms can use the results offered by research on conflicting objectives for guidance in adopting corporate social responsibility in their procurement practices (Walker and Harland, 2008). Adopting sustainability measures such as the new IOM regulations will have extra costs for organizations (S12).

Another issue is that goal setting in humanitarian operations is complicated because multiple actors with different and sometimes conflicting missions and objectives are part of the humanitarian supply chain. For example, sustainability standards are an important concern for some donors and HOS, but enforcing strict sustainability standards may leave small local suppliers out of the UN marketplace (Hasselbalch et al., 2014). Additionally, some donors require HOS to procure products from the donor’s home country, which may not be the best option from a sustainability perspective (Kunz and Gold, 2017).

One avenue for future studies is to develop a performance evaluation framework for procurement in HOS. Like other management systems, procurement requires a performance measurement system to analyze the efficiency and effectiveness of procurement activities. Purchasing efficiency is related to the training and motivation of purchasing personnel, policies, and procedures, along with information management. To make effective and efficient procurement decisions, HOS use employee and supplier codes of conduct (HO5) to ensure that all employees and suppliers respect their values and principles. Although the UN is concerned with achieving value for money in how it procures goods and services, it also has other policy objectives (Walker and Harland, 2008). For example, the UN Supplier Code of Conduct has four principles: labor, human rights, ethical conduct, and environment (UN Procurement Division, 2018). Companies doing business with the UN are required to accept and comply with those principles. UNICEF reserves the right to terminate any contract unconditionally and without liability if the supplier is discovered to participate in non-compliant activity (HO9). The UN Office for Project Services has developed three pillars for sustainable procurement (Fig. 2).

Ethical procurement standards and corruption in local procurement practices are also concerns in humanitarian operations (Schultz et al., 2008). For example, the ICRC purchasing code of conduct ensures the highest ethical standards for themselves and their suppliers:

“Criteria on working conditions, hygiene, security, safety, child labor, and environmental concerns are assessed in the manufacturing units for major essential household items manufactured in low cost countries. In 2012, 62 factory assessments were carried out for kitchen sets, buckets, foldable jerry cans, mosquito nets and sleeping mats. The ICRC mandated third party inspection companies to visit factories in China, Vietnam, Pakistan and Kenya for social, environmental and quality audits” (Sustainable Development at the ICRC, 2012; HO14).

Further research is needed to understand how HOS can promote sustainability in the procurement process. Field studies can show how sustainability practices and systems are being implemented at the various levels of an organization. Furthermore, how sustainability affects other organizational goals like cost reduction should be investigated. Lastly, the different roles stakeholders like donors and host governments should play in sustainable procurement needs to be explored. Our literature review suggests that organizations can adopt sustainability practices that vary with a given product’s importance and supply risk (Krause et al., 2009). For example, they can develop industry-wide standards and include sustainability as a criterion in supplier selection and performance evaluation.

4.3. Procurement processes

Seven papers in Table 3 examine procurement processes. Humanitarian procurement processes may be affected by political preferences of external actors or influence of powerful actors on humanitarian operations. Siawsh et al. (2019) explore perceptions of corruption, bias, inequality, and misuse of resources by HOS. Atkinson and Sapat (2012) investigate the role of institutional culture and quality, transparency, and fairness practices in procurement in the aftermath of Hurricane Katrina. In a follow-up study, the authors examine the role and impact of county government policies and practices on business recovery in the aftermath of Hurricane Wilma (Atkinson and Sapat, 2014). Buddas (2014) and Pazirandeh (2011) explore process management in humanitarian procurement. Buddas (2014) proposes a bottleneck analysis framework for preparedness in the International Federation of Red Cross and Red Crescent Societies (IFRC) supply chain, while Pazirandeh (2011) outlines a decision-making process for sourcing and distributing vaccines in developing countries.

The humanitarian supply chain processes are also affected by multiple environmental and operational risks, such as financial risks like currency exchange risk and hyperinflation, port strikes, political instability, corruption, poor accountability, and a generally insecure work environment. Along these lines, Jahre (2017) reviews HO risk mitigation strategies like sourcing and procurement activities and Pontre et al. (2011) introduce a procurement-risk assessment methodology for identifying, rating, monitoring risks, and implementing capacity-building initiatives in AIDS, tuberculosis, and malaria programs in 26 countries.

Our interviews revealed multiple practices and challenges related to procurement processes. As an example, procurement processes at the
IOM are generally guided by the following (HO4): (i) efficiency and economy, (ii) equal opportunity and open competition, (iii) process transparency and adequate documentation, and (iv) the highest ethical standards in all procurement activities. This results in standardized, bureaucratic, and time-consuming procedures that increase the transparency of processes and reduce the risk of corruption and fraud (HO3 and HO11). All offers should be recorded, with ranking criteria clearly explained, and approved by all responsible parties. Justification for supplier selection is an important part of the selection process and must be auditable, transparent, and understandable (HO7).

In development aid, demand has a predictable pattern allowing for long-term planning, lower costs, and fewer time constraints in the procurement of supplies (HO14). In emergencies, by contrast, demand is extremely unstable and difficult to forecast. Unlike development aid missions where data are collected and an accurate representation of needs is presented, needs assessments in emergency response are quick and approximate. The most prominent difference is transitioning from efficiency to urgency. Therefore, in emergencies, bureaucratic procedures can hinder the agility of HOs and slow down the entire supply chain (HO9). To avoid this, HOs such as the World Health Organization (WHO) and the ICRC have specific sets of rules and regulations that take over when an emergency is declared by senior management. In an emergency response, competitive bidding and contract review processes can be waived (HO13) and single-source procurement can be used (HO12). The primary focus of the procurement function switches to lifesaving; thus, supplier competition is not required (HO5). This can lead to unusual and sometimes irrational procurement processes in which the proximity of suppliers and warehouses takes on a completely different weight (HO13). Urgency leads to ad hoc solutions like purchasing second-hand equipment, repositioning supplies from other projects, renting equipment, and borrowing items from other UN agencies (HO9).

In the preparation phase of humanitarian operations, pre-existing agreements between international and local traders, manufacturers, and small suppliers are established. Fixed rates for products and services are necessary at the onset of an emergency. This removes competition and means the aid organization is certain to have materials, goods, and services ready (HO14). Local procurement is prioritized over offshore procurement in emergencies to respond quickly and procure culturally appropriate supplies (HO9). However, in a major disaster, local procurement will also be affected, thus shifting preference to centralized purchasing (HO3).

One way to enhance the efficiency and effectiveness of procurement processes is through adopting e-procurement solutions. HOs use multiple digital technologies or solutions for procurement. For example, ICRC uses JD Edwards software for procurement and Oscar Light software for tracking orders to their delivery points (HO12). Our interviewees from the WHO and ICRC mentioned tracking supplier details in a database that includes catalogue pricing, quality rating, and all contractual agreements related to specific suppliers’ goods and services. This database also supports electronic tendering and sourcing that allows promoting globally competitive bids on a large scale (HO13), cutting out intermediaries, and shortening the supply chain (HO14).

The UN Global Market (UNGM, 2020) is a common platform for procurement to assure widespread tender opportunities and the provision of equal and open conditions for potential bidders (HO6). The UNGM also informs vendors of upcoming tender notices. Vendor information within the UNGM is central to UN organizations to shortlist suppliers for competitive bidding (HO9). In addition to the UNGM, other applications used in humanitarian procurement include the Material Master Data, Processes and Resources Integrated Systems Management, the Online Survey, and a Global Stock List App (HO6 and HO17). At IOM, country offices also communicate and disseminate information like searching for suppliers by sharing relevant messages on social media. MSF uses a software application called UNIFIELD to create and manage RFQs, RFPs, and RFIs, and manage supplier relationships (HO8). Another NGO, War Child Holland, uses a software called Unit4, which allows electronic workflow authorizations and audits. They also use an automated solution called FinScan to screen suppliers against sanction lists (HO5). The WHO uses an enterprise resource planning (ERP) system called the Global Management System, which provides a vast range of services, including global procurement and logistics (HO13).

Our interviewees discussed the benefits, challenges, and risks of e-procurement solutions in humanitarian operations. The use of these electronic tools minimizes exposure to corruption and promotes transparency, as they encourage open communication and provide access to data and information throughout an organization and its suppliers. For example, the database used by the WHO ensures a certain degree of accountability because it was designed to comply with the WHO’s internal procurement procedures. E-procurement solutions are also environmentally friendly because they dramatically reduce the need for and use of paper documents (HO13). They deliver real-time availability of auditable procurement records, support data analytics, efficient reporting and monitoring (HO6), and increased compliance with procurement policies (HO9).

Does digitalization of procurement enable HOs respond swiftly to emergencies? Since development aid missions are more predictable and thus allow for better planning and procurement, they may be more appropriate for adopting e-procurement strategies. However, ERPs are not particularly efficient in emergencies. Practitioners often view these systems as an obstacle to the procurement process because they rely on robust internet connections and reliable power supplies. The response to the Ebola outbreak in Democratic Republic of Congo is a good example of the lack of reliability of such seemingly basic tools. The WHO’s operation for this epidemic is scattered through extremely remote areas of the North Kivu region. In some areas, field agents set up camps under extremely spartan conditions. The use of an ERP for procurement under those circumstances, especially for local purchases, is hardly imaginable, let alone suitable, and is often bypassed using manual paper purchase orders and single-quote sourcing that ignores account thresholds and competitive bidding (HO13). The extensive need to train users and the high costs of technology development and maintenance are other disadvantages of ERPs (HO17).

Our interviewees also noted that the safety and security of staff in humanitarian operations is a major concern. In conflict zones, for example, surveillance, monitoring, and intrusions must be carefully and tightly controlled (HO14). In addition, the possibility of weaponizing information systems through cyber-attacks must be taken into consideration by HOs. The use of digital technologies that require computer skills can widen the gap between the haves and have-nots, leading to internal pushback and tensions between HOs (HO14).

Understanding the adoption of e-procurement solutions in terms of antecedents or contingency factors, for example, has not been sufficiently explored in the humanitarian procurement literature. Walker and Harland (2008) found that e-procurement is used at the UN for routine transactions and non-strategic purchases. They found that UN development agencies are more likely to adopt e-procurement than humanitarian aid agencies, as the development agencies’ operations are more predictable. One barrier to adopting e-procurement solutions is the perception that they conflict with UN policies of supporting less developed nations, regions, and organizations that suffer from a lack of or a damaged communication infrastructure or the digital divide (i.e., accessibility issues or inability to use information). Consequently, many local suppliers are unable to trade using e-commerce technologies (Walker and Harland, 2008). This discussion opens a research avenue on HOs’ adoption of a multi-channel approach that uses both electronic platforms and traditional paper registrations to manage procurement processes. We need to understand the antecedents for effective e-procurement in humanitarian operations, explore barriers to implementation, and identify best practices.
4.4. Inter-organizational relationships

Organizations develop inter-organizational relationships with other relief organizations (horizontal collaboration), and with suppliers (vertical collaboration). We found six papers that touch on inter-organizational relationships for procurement purposes. Horizontal collaboration is investigated by Pazirandeh and Herlin (2014), who look into the impact of cooperative purchasing on buyers’ purchasing power in the context of freight forwarding. Vaillancourt (2017) studies the role of UNICEF Supply Division in consolidating the procurement needs of multiple HOs. UNICEF Supply Division uses its technical and market knowledge, supplier relationship programs, and e-procurement to undertake group purchasing. Vaillancourt (2017) shows that consolidation reduces procurement costs and results in high quality partnerships. Pazirandeh and Norman (2014) explore the relationship between purchasing strategies carried out by low-power buyers in vaccine supply chains. da Silva Lamenza et al. (2019) applies Kraljic’s framework to a humanitarian context to identify the type of appropriate relationships with suppliers. Zhang et al. (2015) also take a cross-sectional partnership approach to investigate the influence of public–private–people–partnerships on sustainable and better-value-for-money post-disaster infrastructure projects.

Previous studies in humanitarian procurement have rarely explored supplier management (Beult et al., 2016), which is an established research area in the commercial sector. Buyers and suppliers typically have different and conflicting objectives. Buyers seek flexibility and fast delivery while suppliers strive to reduce their costs, which slows the response to any changes. Maintaining good relationships with suppliers can enhance quality improvement, enable faster product development, and lead to better risk management within an organization.

Another topic that has not been studied in the humanitarian context is supplier development (Jahre, 2017). Organizations can adopt multiple practices to develop the capabilities and skills of their suppliers and improve their performance: investment, training programs, visiting and on-site consultation, and setting improvement goals are examples (Glock et al., 2017). Future studies can also develop decision-making models to assist HOs in determining suitable suppliers and optimum resources for development programs (Glock et al., 2017).

Our interviewees also identify some challenges that beg to be further explored. Given the funding constraints in the preparation phase and the uncertainties around demand in humanitarian operations, how can relationships with strategic suppliers be established to create an agile supply chain for HOs (S3)? What is the effect of high staff turnover in HOs on their relationships with suppliers (S4)? How can we enhance information visibility in humanitarian supply chains (HO1)? To what extent are suppliers involved in defining the specifications of products and services, product development, or improvement (S3 and S8)? What are best practices to empower and involve local suppliers in these processes? What are the intra- and inter-organizational dynamics in humanitarian procurement, such as those between needs assessment and procurement teams, or local offices and headquarters?

5. Conclusion

The high levels of uncertainty and complexity in humanitarian operations, along with additional contextual factors, distinguish procurement activities in a humanitarian setting from those in the commercial sector. It is important for scholars of humanitarian supply chain management to explore further, how factors like stakeholder expectations, contextual assumptions, organizational structures, and environmental factors influence procurement practices and policies for HOs. This study provides an overall perspective of the humanitarian procurement literature, and complements it with interview data with managers from HOs and suppliers, summarizing a number of future research areas where studies can contribute to literature and have practical relevance.

An analysis of the published research indicates growing scholarly attention in recent years (Fig. 1a). Despite the growth trends, more recently (2017–2019) scholars seem to have placed more attention to procurement’s primary activities rather than supporting ones. Considering the focus of attention within specific procurement activities, Fig. 1b suggests that the three activities of supplier selection, contract design, and procurement processes have been studied the most (59% of all research articles).

With respect to procurement supporting activities, all reviewed studies except one (Atkinson and Sapat, 2014) were exploratory and used data from literature reviews, interviews, workshops, focus groups, and secondary sources. Thus, most work in this area has been conceptual. In contrast, studies related to procurement primary activities adopted a range of approaches, including conceptual, empirical, analytical, and modeling. Among the different methods, “hard” operations research techniques (e.g., multi-criteria decision aids and mathematical programming) are most common. These methods can improve the effectiveness and efficiency of purchasing decisions by providing faster, automated analysis of supplier information, quotation analysis, and order allocations, and by eliminating redundant criteria and alternatives from decision and evaluation processes. As a result, these techniques add greater fairness and transparency to the final decisions by rationing communicating and justifying the outcome in supplier evaluation and contract awards. In addition to these methods, soft or qualitative operations research methods support decision makers in defining needs and product specifications, analyzing make-or-buy decisions, identifying criteria for supplier selection, or facilitating group decision-making regarding sourcing. However, the use of soft operations research in humanitarian procurement is rather rare compared to quantitative operations research methods.

Scholars argue that any study related to procurement in HOs must account for the particularities of the humanitarian context (De Vries and Van Wassenhove, 2020; Kovacs and Moshtari, 2019). Otherwise, the study will be based on assumptions not grounded in practice, and the findings will not provide valuable implications for HO practitioners. For example, in developing countries, challenges like political pressure, a lack of political will, corruption, weak institutions, and poor enforcement mechanisms can all threaten compliance with procurement laws (Ibrahim et al., 2017). In this vein, the value of exploratory studies can be enhanced by collecting real field data to understand the actual practices of HOs and their procurement challenges. Then, modeling and analytical methods can complete these exploratory studies by developing tools for optimizing and improving decision-making.

Although sourcing, supplier selection, and contract design studies all aim to provide rational and analytical decision models to assist humanitarian practitioners in procurement decisions (Kaufmann et al., 2014), recent behavioral studies revealed that heuristic or experience-based, intuitive decision-making can benefit managers, especially in dynamic contexts or situations where information is not available or rapidly becomes outdated (Akinci and Sadler-Smith, 2012), and where practitioners work under greater time pressure (Salas et al., 2010). Along these lines, the dynamics of the political environment within which purchasing decisions are made, such as opportunistic behaviors like selectively disclosing information, manipulating requirements, and self-servicing incentives should be explored (Franke and Foerstl, 2020).

Humanitarian researchers must consider the diversity in the humanitarian sector and the peculiarities of different HOs when collecting data, developing analytical methods, recommending specific tools and generalizing the results of their studies. For example, most case studies have explored large HOs, especially UN agencies, which raises concerns about the generalizability of their results to the whole population of humanitarian actors. HOs have different missions and mandates, vary widely in size and scope, and differ in their formal status (governmental, NGO, or UN agency; see Charles et al., 2016). Governance levels differ depending on the country, with some having national, regional, and local authorities to take into account. Atkinson and Sapat (2012) assert...
that researchers need to investigate procurement practices not only at the highest or federal level but also at the local level and any levels in between.

Collaborating with HOs is one of the practices we suggest; it can facilitate practitioners’ engagement in problem formulation, allow access to secondary data or the collection of primary data and, eventually, encourage practitioners to implement tools in practice, observe the results, and improve the model or theoretical framework. Collaborations can also be established with the network of HOs or institutions that deliver consulting services to HOs. The Inter-Agency Procurement Group is a network of professionals that seeks to coordinate procurement and share knowledge about humanitarian procurement between professionals. Fleet Forum offers training and consulting services to HOs on developing tendering processes and documents. The Global Logistics Cluster aims to facilitate procurement activities among HOs.

Action research or design science approaches would be appropriate for enabling researchers to assess the results of the models in practice, revise them if needed, and then develop theory (Kunz and Van Wassenhove, 2019; Zarei et al., 2019). Battista Hesse et al. (2019) suggest two principles for establishing successful relationship with organizations: “solutions developed had to be grounded in evidence and have the capacity to be operational.”

The next item is the multidisciplinary nature of procurement management (Wynstra et al., 2019). This requires researchers not to focus on their individual analytical or empirical methods but to bridge their fields of studies, collaborate with other researchers, and explore procurement activities in HOs from multiple lenses established in decision-making models, supply chain management, or organization studies. Empirical methods, whether qualitative or quantitative, and analytical modeling methods each have advantages and disadvantages. In reality, using a mixed-methods approach or building on studies employing methods other than those we normally use could add to the reliability of the findings and provide implications for practice. Kovac and Moshtari (2019) suggest a framework that maps out how studies using different research methods can provide synergy when properly combined.

Building on the interviews with practitioners at HOs and suppliers we elaborated challenges and real practices related to each procurement activity in the paper. Here we want to conclude the paper by highlighting three of these challenges. First, donors and governments require HOs to develop and follow transparent procedures that include humanitarian, ethical, and sustainability policies. The increasing importance of sustainability, as evinced by the UN Sustainable Development Goals, has prompted the addition of new supplier-selection criteria. Accordingly, HOs need to identify, understand, and maintain compliance with restrictions imposed by donors and host governments. However, to ensure fast delivery of products and services to beneficiaries, HOs need to develop flexible procurement procedures, especially in emergencies. They may have less time to search for and select good suppliers, which increases the risk of ordering from an unreliable supplier.

Second, the rapid development and widespread adoption of digital technologies have increased the expectations for HOs to make data-driven purchasing decisions, have more transparent procedures, identify and seize on cost reduction opportunities, reduce the amount of time and money spent searching for new suppliers and, eventually, provide an opportunity for more suppliers to join the bidding process. Third, like the commercial sector, HOs focus largely on practices to procure relief items at the lowest cost. To some extent, HOs implement risk mitigation practices to obtain reliable supplies when and where they need them. However, it would be better for at least large HOs to consider the potential of procurement in value creation for the benefits of HOs through new product development, or its potential as policy tool to stimulate innovation or minimizing unemployment by providing opportunities for local businesses (Grandia and Meehan, 2017). In addition, if HOs want to be more agile and cost-effective in responding to needs, they should focus on setting up good communication and intra-organizational relationships with project or program members, having a cohort of pre-screened competent suppliers and, if necessary, formalizing long-term agreements with these suppliers.
types of products such as those that are strategic or tend to become bottlenecked in terms of supply and formulating strategies for approaching their suppliers are among procurement managers’ other key tasks.

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Appendix A

Count of Papers Reviewed by Journal of Publication.

| Journals                                                                 | Number of publications |
|-------------------------------------------------------------------------|------------------------|
| Journal of Humanitarian Logistics and Supply Chain Management           | 11                     |
| Computers & Industrial Engineering                                      | 3                      |
| International Journal of Disaster Risk Reduction                        | 3                      |
| International Journal of Physical Distribution & Logistics Management   | 3                      |
| Journal of Public Procurement                                           | 3                      |
| Production and Operations Management                                    | 3                      |
| Annals of Operations Research                                           | 2                      |
| European Journal of Operational Research                                | 2                      |
| International Journal of Procurement Management                         | 2                      |
| International Journal of Production Economics                            | 2                      |
| Socio-Economic Planning Sciences                                        | 2                      |
| Decision Sciences                                                       | 1                      |
| Disaster Prevention and Management                                      | 1                      |
| International Journal of Disaster Resilience in the Built Environment   | 1                      |
| International Journal of Operations & Production Management             | 1                      |
| International Journal of Production Research                            | 1                      |
| International Journal of Services and Operations Management             | 1                      |
| Journal of Business Logistics                                           | 1                      |
| Journal of Homeland Security and Emergency Management                    | 1                      |
| Journal of Purchasing and Supply Management                             | 1                      |
| Omega                                                                   | 1                      |
| SAGE Open                                                               | 1                      |
| Supply Chain Management: An International Journal                       | 1                      |
| Transportation Journal                                                  | 1                      |
| Transportation Research Part E-Logistics                                | 1                      |
| World Development                                                       | 1                      |

Appendix B

Supplier and HO interviewees.

| Code in the manuscript | Company name                     | Position                                           |
|------------------------|----------------------------------|----------------------------------------------------|
| S1                     | Alpinter                         | Business Development Manager                       |
| S2                     | CLS Group                        | Sales Engineer Fleet Management                    |
| S3                     | Labaronne                        | Project Officer                                    |
| S4                     | TSF Supply                       | Manager                                            |
| S5                     | Nutriset                         | Operations Manager                                 |
| S6                     | IC2 Feeniks Oy                   | Export Manager                                     |
| S7                     | ImLog Oy                         | Export Marketing                                   |
| S8                     | Relief Supplier                  | GM Operations                                      |
| S9                     | SCAN Global Logistics            | Head of Aid Department                             |
| S10                    | Medicine Durbin                  | Business Development Specialist                    |
| S11                    | Blue Water Shipping              | Freight Forward Agent, Aid Logistics               |
| S12                    | Kuehne + Nagel                   | Emergency and Relief Logistics Projects            |
| S13                    | Nissan                           | Marketing and Sales Coordinator                    |
| S14                    | Intertek                         | Government and Trade Services                      |
| S15                    | Humanitarian Quality Assurance Initiative (HQAI) | Head of Marketing |
| S16                    | Imerys                           | Marketing Manager                                  |
| S17                    | Pix4D                            | Business Development                               |
| S18                    | Paramount                        | Director                                           |
| S19                    | ReliefLine                       | Director                                           |
| S20                    | Bollore Logistics                | Business Development Manager                       |
| S21                    | Kitchen Essentials               | Partner                                            |
| S22                    | Human Smile                      | Partner                                            |

(continued on next page)
Appendix C

Interview Protocol.

Note: The interview questions need to be customized and adapted in each interview based on the role of informant and type of NGO or supplier.

– What are the key steps in procurement at the humanitarian organization?
– Which division (people) is in charge of procurement at the organization?
– What are the important criteria in selecting suppliers at the organization?
– What type(s) of contract does the organization offer to suppliers?
– What are the challenges of procurement in a humanitarian setting? How does it affect the organization? Beneficiaries? Donors?
– Does your organization collect and analyze the spend data of organization? If not, what are the reasons (e.g., There is no such spend analysis data? It is not accurate? Lack of skills?)
– Is sustainability incorporated into the procurement practices of organization? (e.g., Supplier selection? Contract design? Supplier evaluation?)
– Please mention the extent to which the organization uses digital technologies in procurement (e.g., software, e-procurement, e-auction). What are the benefits and challenges of adopting these technologies?
– Does the organization have different purchasing processes in development programs and emergency relief operations? If yes, please briefly describe such differences.

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