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# 12 Integrating Sustainability into Humanitarian Procurement

## *A Prioritization of Barriers and Enablers*

*Mohammad Hossein Zarei,  
Ruth Carrasco-Gallego, and Stefano Ronchi*

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***12 Integrating Sustainability into Humanitarian Procurement:  
A Prioritization of Barriers and Enablers***

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**Abstract:** Humanitarian supply chains are characterized by uncertainty and unpredictability of demand and volatility of the context. Despite such specificities, integrating sustainability into humanitarian procurement seems imperative due to the dire need stated by research and past antecedents of unsustainable procurement. This study identifies the barriers and enablers on the way of integrating sustainability into humanitarian procurement. The ideas of three humanitarian experts were elicited for identification of the barriers and enablers. Next, a group analytic hierarchy process (AHP) was applied to aggregate the ideas of experts and prioritize the barriers based on their potential for improvement. The results show that “local procurement” is the most important category of barriers, followed by “funding environment”, and “inter- and intra-organizational barriers”. Finally, the barriers and enablers within each category are discussed in detail and possible ways to address them are suggested.

**Keywords:** Humanitarian Supply Chain, Humanitarian Procurement, Sustainable Procurement, Sustainability, Barriers and Enablers, Analytic Hierarchy Process, AHP

## 12.1 Introduction

Humanitarian supply chain and logistics have been gaining momentum considerably in academic literature within the past decade. Humanitarian supply chain and logistics can be defined as “the process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials, as well as related information, from the point of origin to the point of consumption for the purpose of alleviating the suffering of vulnerable people” (Thomas & Kopczak, 2005, p. 2). While having some similarities with commercial supply chains, they are fundamentally different in several perspectives (Kunz, Van Wassenhove, Besiou, Hambye, & Kovács, 2017); First, the timing and the location of final customers, called beneficiaries in humanitarian supply chains, are unpredictable. Second, humanitarian supply chain management is often subject to high time pressure. Third, beneficiaries do not have a strong voice in stating their needs.

All these characteristics relate to purchasing and supply management function in humanitarian operations: The procurement department has to deal with the unpredictability of demand by estimating the location and storing prepositioned inventory to be used for emergency first response. The department should also estimate and supply necessary items, ranging from food to shelter, essential living aid, and medical items, needed by the impacted population. Therefore, purchasing and supply management function performs atypical activities different from its counterparts in commercial supply chains. In order to address these peculiarities, the academic literature has focused on different aspects of humanitarian procurement hitherto.

A stream of literature is devoted to improving the bidding and contracting in humanitarian procurement. Falasca and Zobel (2011) proposed a two-stage procurement decision model to address the uncertainty in disaster relief operations. Ertem, Buyurgan, and Rossetti (2010) proposed a procurement auctions-based framework for humanitarian procurement that involved announcement, construction, and evaluation of bids. In their next study (Ertem, Buyurgan, & Pohl, 2012), the authors focused on the announcement

phase of the framework and introduced substitution and partial fulfillment options to diversify suppliers and include suppliers with fewer inventories. Bagchi, Aliyas Paul, and Maloni (2011) proposed an auction mechanism in supplying food for emergencies that decreased the possibility of gaming through a uniform price option. Their mechanism led to higher participation of actors and increased delivered food aid volumes. The study of Trestrail, Paul, and Maloni (2009) outlined a mixed integer program decision tool that aimed at enhancing ocean carrier and food supplier bid pricing strategy. Finally, Balcik and Ak (2014) modelled the supplier selection problem for a humanitarian organization with framework agreements. The results show that the supplier selection and subsequent costs are sensitive to contract agreement terms in situations with high-impact disasters.

The second stream of work on humanitarian procurement has focused on the issue of inter-organizational cooperation for purchasing humanitarian items. Vaillancourt (2017) studied the procurement consolidation in humanitarian supply chains and concluded that inter-organizational collaboration for consolidated purchasing leads to reduced costs and higher quality of procured items. Herlin and Pazirandeh (2012) studied the impact of nonprofit and humanitarian organizations on shaping the market and the dominance over suppliers. Later (Herlin & Pazirandeh, 2015), they expanded their study to provide a framework for successful cooperative purchasing. Interestingly, they also addressed the pitfalls that might impede cooperative inter-organizational purchasing in humanitarian context. In another study (Pazirandeh & Herlin, 2014), they approached the cooperative purchasing from the buyer's perspective and studied how cooperative purchasing impacts on buyer's purchasing power. The study generated insights about the reasons that cooperative purchasing might fail due to inappropriate procurement strategy. More recently, Nikkhoo, Bozorgi-Amiri, and Heydari (2018) addressed the issue of coordination of relief items procurement through a quantity flexibility contract in multi-echelon humanitarian supply chains. Their proposed model decreases losses of relief procurement and improves the satisfaction level of the affected area.

The third stream in humanitarian procurement literature focuses on sustainable procurement. This stream, although currently limited, is growing. Most of the works in this stream address the social pillar of sustainability, especially through ethical procurement. Schultz and Søreide (2008) delved into the problem of corruption in humanitarian emergency procurement. Their study revealed that internal agency control mechanisms, conflict-sensitive management, and the need for common systems among operators can be appropriate mechanisms to prevent corruption. The study of Wild and Zhou (2011) explicated ethical procurement strategies for humanitarian aid organizations. The results of their study expressed that concerns about ethical risks in humanitarian supply chains are different from commercial ones. The research about environmental sustainability in humanitarian procurement is even more limited as compared to social pillar. The work of Van Kempen, Spiliotopoulou, Stojanovski, and De Leeuw (2017) is among the few studies that explicitly considers all aspects of sustainability in humanitarian procurement. They conducted life cycle sustainability assessment to compare different humanitarian procurement strategies in terms of sustainability. Their results show that local sourcing is more environmentally and socially sustainable than international sourcing. Local sourcing contributes to social sustainability by supporting and empowering local societies while it also contributes to environmental sustainability

by decreasing the carbon emissions emanating from international logistics. Looking at local procurement from that perspective, the study of Matopoulos, Kovács, and Hayes (2014) and more recently Piotrowicz (2018) investigate and propose deploying local sourcing in humanitarian supply chains. Other topics covered by previous research on humanitarian procurement are: vehicle procurement policy (Eftekhar, Masini, Robotis, & Van Wassenhove, 2014), e-procurement (Walker & Brammer, 2012), joint procurement and inventory decision (Hu, Han, & Meng, 2017; Torabi, Shokr, Tofighi, & Heydari, 2018), and supplier partner selection (Venkatesh, Zhang, Deakins, Luthra, & Mangla, 2018).

From the review of literature on humanitarian procurement several gaps are identifiable. First, the literature around the topic of humanitarian procurement is still at its early stages. While there is a rich amount of literature about commercial procurement, the insights are often inapplicable for humanitarian organizations due to fundamental differences (Park, Kazaz, & Webster, 2018; Venkatesh et al., 2018). Within the topic of humanitarian procurement, the issues of bidding and contracting are probably the leading ones with higher number of publications and citations while other issues such as sustainability have received considerably less attention. As for the methodology, the majority of reviewed papers adopted a quantitative approach to model and solve a specific procurement situation, while qualitative methods which study humanitarian specificities (barriers and enablers) in procurement and how to address them are missing. Finally, the literature of humanitarian procurement overlooks sustainability. However, previous research highlighted that sustainability in general, and specifically environmental sustainability, has to be considered for the future research in the area of humanitarian procurement (Abrahams, 2014; Sarkis, Spens, & Kovács, 2012).

This chapter tries to address the aforementioned gaps by integrating sustainability into humanitarian procurement. It aims at identifying the humanitarian procurement specificities in form of barriers and enablers and distinguish the most impacting ones. In doing so, it contends to respond to the following research question:

*What are the most important enablers and barriers for integrating sustainability into humanitarian procurement?*

The rest of this chapter is as follows. Section 12.2 reviews the concept of sustainable procurement and how it can be linked to humanitarian procurement. Section 12.3 introduces group analytic hierarchy process (AHP) as the methodology of the study. Section 12.4 describes the application of the methodology by synthesizing and ranking enablers and barriers of sustainable procurement in humanitarian supply chains. Section 12.5 discusses the findings and provides suggestions to tackle the barriers. Finally, section 12.6 concludes the chapter, provides the limitations of the study, and suggestions for future research.

## **12.2 Sustainable Procurement in Humanitarian Supply Chains**

After the review of humanitarian procurement in previous section, this section explores the integration of sustainability in humanitarian procurement. It reviews the literature on the sustainable procurement both from academic and practitioners' perspectives and then

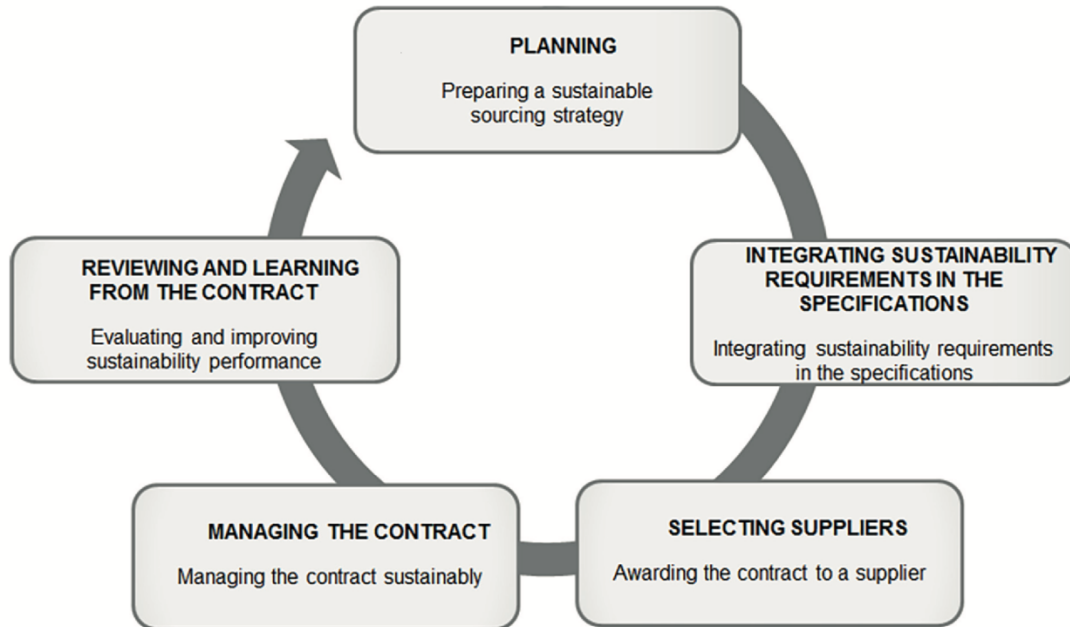
discusses the importance and the need for sustainable procurement in humanitarian sector.

In this chapter, we take the notion of triple-bottom line (Elkington, 1998) for sustainability including social, environmental, and economical sustainability, also known as 3Ps: people, profit, and planet (Kleindorfer, Singhal, & Wassenhove, 2005). Increasingly, organizations and academics realize that sustainable procurement is the key to address sustainability issues along the supply chains. Walker, Miemczyk, Johnsen, and Spencer (2012, p. 201) defined sustainable procurement as “the pursuit of sustainable development objectives through the purchasing and supply process. Sustainable procurement is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits, and promoting good governance”. The literature review of Schneider and Wallenburg (2012) on the implementation of sustainable sourcing showed that the purchasing and supply management function needs to change its internal and external relationships in order to duly adapt and implement sustainable sourcing. In the same vein, the review study of Hojmosse and Adrien-Kirby (2012) identified socially and environmentally responsible procurement as salient managerial issues that managers need to address in the 21<sup>st</sup> century.

Probably the closest studies about sustainable procurement to this study are Walker and Brammer (2009), Brammer and Walker (2011), and Hasselbalch, Costa, and Blecken (2015). The study of Walker and Brammer (2009) investigated sustainable procurement in the UK public sector and found that there is a significant variation across different public organizations in the implementation of sustainable procurement. Brammer and Walker (2011) investigated the same problem but in an international context of public bodies. Both studies found that cost and lack of management support can be the main barriers on the way of sustainable procurement. Similarly, Hasselbalch et al. (2015) studied the barriers of sustainable procurement in the United Nations and developed a framework which included different classes of barriers. These works offer valuable insights on the identification of barriers and enablers of sustainable procurement in public sector which is different from humanitarian environment. Moreover, they have not prioritized the identified barriers according to their importance and potential for improvement.

From practical point of view, the recent release of the ISO 20400 on sustainable procurement shows the prominence of sustainable procurement implementation for organizations. The ISO 20400 defines sustainable procurement as “the procurement that has the most positive environmental, social and economic impacts on a whole life basis which involves the sustainability aspects related to the goods or services and to the suppliers along the supply chains and contributes to the achievement of organizational sustainability objectives and goals and to sustainable development in general” (International Organization for Standardization, 2017). According to the standard, sustainable procurement should not be viewed as an abstract idealistic goal, but as a reasonable pragmatic aim. In order to integrate sustainability into the procurement process, it proposes five cyclical steps: 1) planning (preparing a sustainable sourcing strategy), 2) integrating sustainability requirements in the specification, 3) selecting

suppliers (awarding contract), 4) managing the contract sustainably, and 5) reviewing and learning from the contract (evaluating and improving sustainability performance). The process is shown in Figure 12.1.



*Figure 12.1 Integrating sustainability into the procurement process*

*Source: International Organization for Standardization (2017)*

Humanitarian context is different from commercial supply chains in many ways. Looking to sustainability, the social aspect (people) is present in humanitarian supply chains by default. While commercial organizations focus on making profit, which sometimes lead to negligence of social pillar, humanitarian supply chain’s prime objective is alleviating the suffering of vulnerable people (Thomas & Kopczak, 2005). Bold social aspect of humanitarian context is at odds with the sustainability trend in commercial supply chain research where environmental sustainability (planet) is more mature, partly because it contributes to waste reduction and profit generation. Therefore, it is imperative that research pays more attention to environmental sustainability in humanitarian supply chains (Sarkis et al., 2012). In this paper, we focus on both social and environmental bottom lines in humanitarian procurement.

There are different views towards humanitarian procurement. Some authors (Oloruntoba & Gray, 2006) argue that humanitarian supply chains should be lean on the upstream of the supply chain and agile on the downstream with a decoupling point in between in order to satisfy the beneficiaries’ need in the most efficient way possible. They consider the leanness as the “value-adding processes unencumbered by waste”. This view is in accordance with the previous stream of research in commercial supply chains which argue “lean is green” (Colicchia, Creazza, & Dallari, 2017) due to elimination of waste. On the

other hand, the study of Matopoulos et al. (2014) considered procurement as no different from other humanitarian supply chain stages with similar characteristics and importance.

Taking one view or the other, integration of sustainability into humanitarian procurement seems imperative. Historic antecedents of humanitarian unsustainable operations suggest that if appropriate sustainable measures were taken into account during procurement, the environmental or social adverse impacts could have been avoided in subsequent stages of supply chain. For example, mosquito nets are common humanitarian items procured and provisioned to the areas impacted by a disaster such as refugee camps. These mosquito nets are treated with insecticides to repel mosquitos. After the nets are torn, sometimes they are used as fishnets by local population and thus releasing the hazardous chemicals into aquatic life (Minakawa, Dida, Sonye, Futami, & Kaneko, 2008). Another example with regards to social sustainability is provisioning of cook stoves to beneficiaries by humanitarian organizations without proper consideration about the fuel. For the cook stoves using charcoal and wood fuel, if the fuel is not supplied properly and sufficiently, beneficiaries gravitate to the ecological environment around refugee camps and temporary houses to collect wood. It exposes them, especially women and children, to the high risk of gender-based violence, wildlife attack, kidnapping, and human trafficking (Barbieri et al. 2017). If these issues had been considered through sustainable procurement, the drastic consequences could be avoided.

Moreover, since procurement of aid items is at the start of the humanitarian supply chain, there are more opportunities for integrating sustainability as compared to later supply chain stages. When an aid item with harmful material in the packaging has already been purchased, distributed, and disposed in the field by beneficiaries, there is little to be done to deal with the waste in a region impacted by disaster and limited recycling facilities. While proper consideration of such issues through procurement, for example by purchasing aid items with biodegradable packaging, could address the root of the problems.

However, with the volatility and unpredictability inherent in humanitarian supply chains, implementation of sustainable procurement is challenging. The specificities of humanitarian context impose that integrating sustainability into procurement requires different solutions from commercial procurement. Therefore, it is important to identify the contextual barriers on the way of sustainable procurement in humanitarian supply chain and prioritize the most important ones. This is the objective of this chapter: to elicit the ideas of humanitarian experts about barriers and enablers of sustainable procurement and rank them according to their potential opportunity for improvement so that future research and practice efforts for integrating sustainability into humanitarian procurement focus on addressing the most pressing barriers.

### **12.3 Methodology**

The methodology of this paper has two parts. First, in order to identify the main barriers and enablers of sustainable procurement in humanitarian supply chains, the ideas of a group of humanitarian experts were elicited through qualitative questionnaires. Second,



when the ideas are gathered and compiled, an analytic hierarchy process (AHP) was used to prioritize the identified enablers.

AHP is a suitable prioritization method that has widely been used in the literature of operations management and research for different aims. It has shown to be a viable tool in humanitarian logistics and has been applied for ranking critical success factors (CSFs) of humanitarian relief organizations (Celik & Taskin Gumus, 2018) and prioritizing emergency shelter areas (Trivedi & Singh, 2017a, 2017b), inter alia. Similarly, from the perspective of sustainable supply chain literature, AHP is strongly justified as a fitting prioritization method. Recent literature review of Maditati, Munim, Schramm, and Kummer (2018) critically reviews the most cited papers and provides a stepwise guideline for future research in green supply chain management. The guideline expresses that developing AHP-based ranking for drivers and barriers of sustainable supply chain should be a main future research agenda. Moreover, group decision-making through the application of group AHP is suggested for addressing multi-faceted and complex problems in new areas of research (Dong & Cooper, 2016). Since sustainable humanitarian procurement is a nascent area of research with little extant knowledge, combining the ideas of experts by group AHP prevents individual subjectivity to creep into the decision-making process and ensures obtaining a meaningful and reliable ranking. The following subsections describes AHP and group AHP in a nutshell. The application of the methodology to a real-world case is described in detail in the section 12.4.

### ***12.3.1 Analytic Hierarchy Process (AHP)***

AHP is multiple-criteria decision making (MCDM) method introduced by Saaty in 1972 which breaks down a problem into several constituent sub-problems, solves each sub-problem, and then aggregates them to solve the main problem (Saaty, 1990). The results offer a prioritized list of criteria from which the best one(s) can be selected. The main steps of conducting AHP are as follows: 1) *defining the goal and hierarchy*, 2) *making pairwise comparisons*, 3) *normalization and synthetization*, and 4) *consistency check*. In the following, a brief description of the procedure of AHP is provided from Zarei and Wong (2014):

*1. Defining the goal hierarchy:* First, the objective of conducting AHP should be defined. Then, the criteria that satisfy the objective and the alternatives should be defined.

*2. Making pairwise comparisons:* Pairwise comparison is the heart of AHP, making it distinct from a mere scoring technique. The decision maker makes pairwise comparisons between each possible pair of criteria and then between each pair of alternatives. The standard preference scale used for AHP is shown in Table 12.1. For example, if criterion  $a$  is strongly preferred to criterion  $b$ , then this comparison receives a value of 5. The comparisons are then recorded in a matrix as shown below (equation 12.1), where  $a_{ij}$  is the result of the pairwise comparison between criterion  $i$  and  $j$ . It is noteworthy that after  $a$  is compared against  $b$ , the result of the reverse comparison ( $b$  against  $a$ ) is simply the inverted value of the first comparison.

$$A = \begin{bmatrix} 1 & a_{12} & \dots & a_{1n} \\ a_{21} & \dots & a_{ij} & \dots \\ \dots & a_{ji} = 1/a_{ij} & \dots & \dots \\ a_{n1} & \dots & \dots & 1 \end{bmatrix} \quad 12.1$$

Table 12.1 Preference Scale for Pairwise Comparisons

Preference Level	Numeric Value
Equally preferred	1
Equally to moderately preferred	2
Moderately preferred	3
Moderately to strongly preferred	4
Strongly preferred	5
Strongly to very strongly preferred	6
Very strongly preferred	7
Very strongly to extremely preferred	8
Extremely preferred	9

Source: Ishizaka and Labib (2011)

3. *Synthetization*: After completing all the pairwise comparisons, the pairwise comparison matrices of criteria and alternatives are normalized by dividing the value of each column by its corresponding sum and then taking the average of the values in each row. The obtained matrices (in form of one-column matrices), called preference matrices, show the priorities of criteria and alternatives. This ranking of decision alternatives is referred to as synthetization. Then, the preference matrices of criteria and alternatives are multiplied to determine the overall ranking of alternatives.

4. *Consistency check*: Since the decision maker might make inconsistent pairwise comparisons, it is imperative to check the consistency as follows:

- multiply the unnormalized pairwise comparison matrix by the matrix resulted from synthetization
- divide each of the obtained values by its corresponding weight derived from the synthetization matrix and then sum up all the values
- divide the sum by the number of criteria and call it  $\lambda$
- calculate the consistency index,  $CI$ , using equation 12.2.

$$CI = (\lambda - n)/(n - 1) \quad 12.2$$

- If  $CI = 0$ , the decision-making process is perfectly consistent; otherwise, determine the level of consistency using equation 12.3. In that equation,  $RI$  is the random index that is obtained from Table 12.2.

$$\text{Consistency Level} = CI/RI \quad 12.3$$

*Table 12.2 RI Values for n Items Being Compared*

<i>n</i>	2	3	4	5	6	7	8	9	10
<i>RI</i>	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.51

*Source: Ishizaka and Labib (2011)*

- If the value of consistency level is 0.1 or less, it means that the pairwise comparisons are acceptably consistent. For greater values, the pairwise comparisons should be made again to achieve an acceptable degree of consistency.

### **12.3.2 Group AHP**

AHP has shown to be an effective tool for group decision making by preventing personal bias during individual decision making (Ishizaka & Labib, 2011). Group AHP is an extension of AHP that combines the preferences and pairwise comparisons elicited from several participants. There are different methods proposed for aggregation of individuals' ideas. Since in the case of this chapter, the respondents were making pairwise comparisons independent and separate from each other, aggregation of individual priorities using geometric mean is suitable (Forman & Peniwati, 1998).

If the ideas of individuals are believed to have different importance, group AHP makes it possible to weigh each individual's idea. Weighting ideas and aggregating them using geometric mean is called "weighted geometric mean method", which is the most common method for aggregation of preferences in the literature of AHP (Xu, 2000). It is shown that if the individual judgments are fairly consistent (based on consistency evaluation described in section 12.3.1), the resulting group AHP using weighted geometric mean is also acceptably consistent, dismissing the need to perform another consistency check for the group AHP (Xu, 2000). Next section introduces the application of group AHP for prioritizing the barriers on the way of sustainable humanitarian procurement.

## **12.4 Identifying and Prioritizing Enablers and Barriers**

The data for this study was collected during a conference on humanitarian logistics in the United Nations City, Copenhagen and an ongoing action research project with an international humanitarian organization. First, the eligibility criteria for the inclusion of respondents were defined by the researchers. Since the research objective was to identify real-world barriers and enablers that humanitarian organizations encounter, the researchers decided that the respondent community should be practitioners working in

the procurement department of a humanitarian organization with at least five years of experience. Moreover, the pertaining organizations from which the respondents were selected had to have sustainability in their agenda, reflected either through annual reports, organizational website, or any other document which is publicly available.

Next, the researchers developed a project description explaining the objective and scope of the study. The objective was identifying barriers and enablers of sustainability in humanitarian procurement. The respondents, based on their experience, had to express the barriers and enablers that impact on integrating sustainability into humanitarian procurement. The researchers identified several respondents with the aforementioned eligibilities and approached them with the project objective and description. Before drawing their ideas, a description of sustainability was provided based on the triple bottom line to ensure that a unique understanding of sustainability exists among all the respondents. Out of several eligible people approached during the conference, three practitioners provided their insights and later participated in pairwise comparison for group AHP. The first respondent was the procurement assistant of a large international humanitarian with seven years of work experience as contract manager and procurement assistant. The second respondent was the logistics and fleet manager at a European delegation of a large humanitarian organization with more than 12 years of work experience. Previous to his current position, he worked as the procurement officer in another international humanitarian organization. The third respondent was the procurement and logistics specialist at the country office of an international humanitarian organization in the middle-east with around six years of work experience. The diversity of geographical regions and work descriptions of the respondents ensured collection of an inclusive list of barriers and enablers.

After gathering the ideas, the barriers and enablers were synthesized. The barriers and enablers stated by respondents were highly alike which showed that the ideas of the respondents were convergent, even though they were from different humanitarian organizations. Similar barriers which were articulated differently were compiled. Finally, a total of 20 barriers and 8 enablers were identified. The researchers categorized them under 6 categories based on the similarity and relevance. The list of identified barriers and enablers are presented in Table 12.3. They will be discussed in more detail in section 12.5.

After the barriers and enablers were synthesized and categorized, the final list was sent to the three respondents for verification and conducting AHP. Since the number of identified enablers were relatively small, only prioritization of barriers was considered. The respondents were asked to make pairwise comparisons between the barriers under each category and then between the categories themselves. The basis for pairwise comparisons was “the possibility to overcome the barrier in practice”. After the results were received, the comparisons were checked for consistency. All the comparison from three respondents showed a satisfactory consistency level with a value under 0.1.

Table 12.3: List of Identified Barriers and Enablers for Sustainable Humanitarian Procurement

Category	Barriers	Enablers
<b>Local procurement</b>	Higher frequency of issues such as child labor, unfair working times, and sweat shops in developing countries	Reduced transportation emissions through local procurement
	Damaged infrastructure in countries impacted by disasters and crises hampering local procurement	Empowering local communities and local capacity building through local procurement
	Lower quality of locally produced products compared to offshore buying	Better addressing of local communities' needs through local procurement
	Lower production capacity of local suppliers	
	Higher price of local suppliers	
<b>Humanitarian context</b>	Time-pressure and urgency overshadowing on sustainable procurement	
	Unpredictability of demand and location	
	Volatility of humanitarian context requires more packaging (for example for airdrops)	
<b>Intra-Organizational</b>	Limited managerial support and will for integrating sustainability into procurement	Recent introduction of ISO 20400 on sustainable procurement
	Limited knowledge and training among procurement staff for sustainable procurement	
	Higher cost of sustainable procurement	
	Autonomous purchase of local humanitarian offices focusing only on the lowest price	
<b>Inter-organizational and supply chain</b>	Different organizations follow different standards and requirements for their procured items	Cooperative purchasing and pooling procurement resources
		Similarity of many humanitarian items procured by different humanitarian organizations
		Humanitarian organizations benchmark and follow each other's successful practices
		Smaller community of humanitarian organizations compared to commercial counterparts
<b>Funding</b>	Low donors' awareness about sustainability	
	Earmarked funding	
	Funding fluctuation	
<b>Supplier relationship</b>	Short-term supplier relationships due to urgency and intermittence of humanitarian procurement	
	Low purchasing power of humanitarian organizations over suppliers of critical products (such as vaccines)	
	Extended humanitarian supply networks and difficulty in tracking indirect suppliers	
	Corruption in supplier selection and purchasing especially by local offices	

Finally, the preferences were aggregated using group AHP. Since the second respondent was a more senior procurement manager with longer experience and he also was in charge of a sustainable procurement project, higher weight was assigned to his preferences. Hence, the weight assigned to the senior respondent was 0.5 and the two other respondents' preferences were given the weight of 0.25. Then a weighted geometric mean

for each pairwise comparison was calculated using equation 12.4; where  $\lambda_i$  is the weight assigned to respondent  $i$ .

$$\bar{x} = \prod_{i=1}^3 x_i^{\lambda_i} \quad 12.4$$

For example, if the set of  $X = (3, 4, 7)$  shows the preferences of the three respondents for a given pairwise comparison within the category of supplier relationship, while the weights are  $\lambda_1 = \lambda_2 = 0.25$  and  $\lambda_3 = 0.5$ , then the aggregated importance for this set using weighted geometric mean is  $(3^{0.25} \times 4^{0.25} \times 7^{0.5}) = 5.37$ .

The rest of preferences were aggregated in the same way. Figure 12.2 shows the final priorities for each category of barriers (criteria) and the barriers within that category (sub-criteria). Next section discusses the identified barriers and enablers and the ranking in more detail.

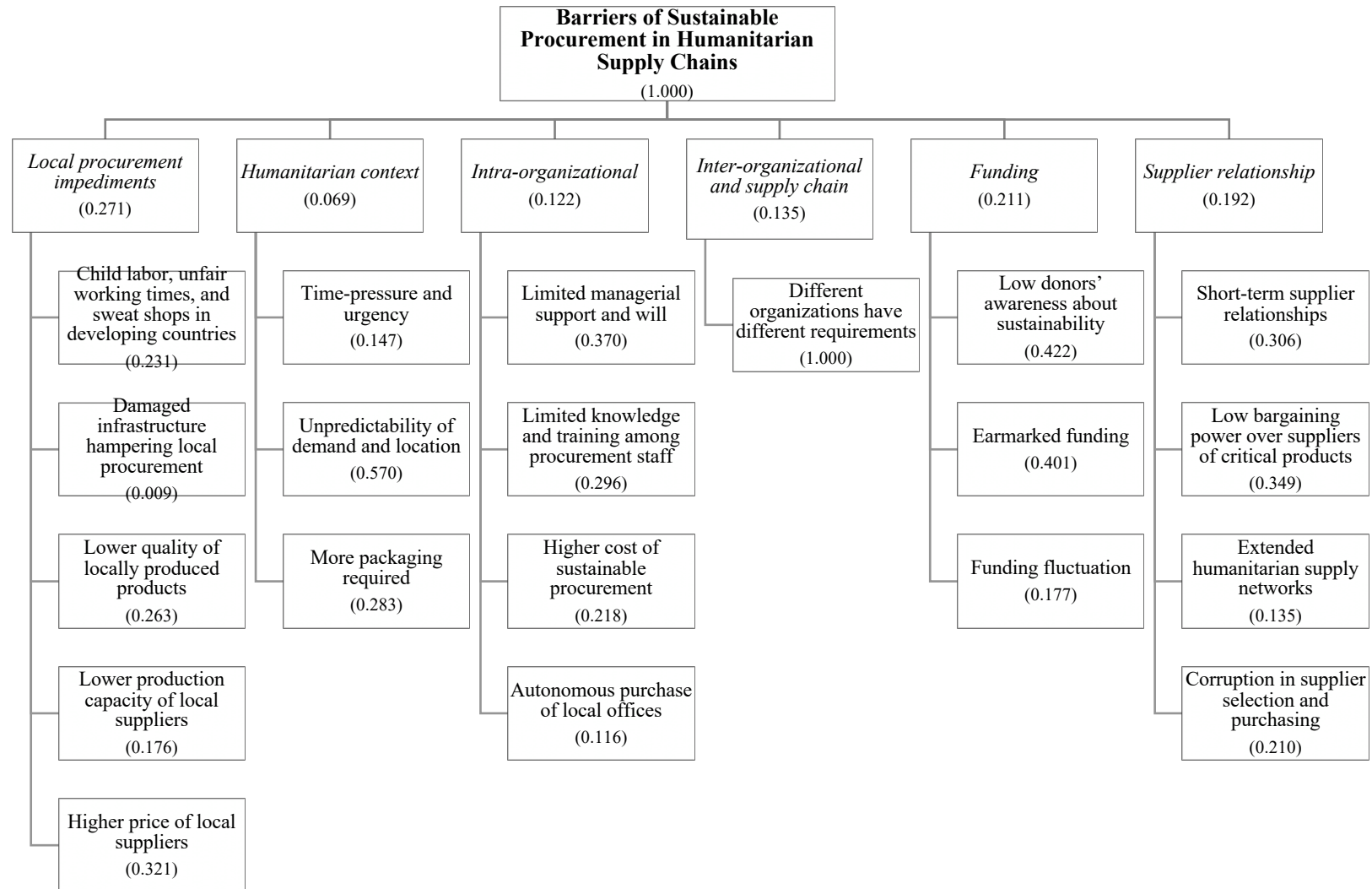


Figure 12.2 Prioritization of Barriers for Sustainable Procurement in Humanitarian Supply Chain

## 12.5 Discussion

This section discusses the identified barriers and enablers and the prioritization results of group AHP. According to Table 12.3, local procurement is the category with the highest number of barriers and enablers (5 barriers and 3 enablers identified). It means that while there are some challenges for local procurement, it is a promising area to start integrating sustainability. The enablers offer several advantages in terms of sustainability for local procurement over overseas procurement. First, local procurement of humanitarian items reduces the need for international freight transport by reducing the distances that items travel and thus, it contributes to environmental sustainability through lowering the emissions emanating from the logistics. Second, buying locally empowers the local community such as local manufacturers and workers by creating jobs and involving the society in value-adding activities. Third, locally produced items better satisfy the needs of local population. For example, previous studies showed that cook stoves which are produced locally for displaced people and refugees are more widely accepted and put into use by beneficiaries due to consideration of local cooking culture (Barbieri, Riva, & Colombo, 2017).

However, humanitarian organizations need to address several local procurement impediments such as higher costs, social issues, lower quality, and lower production capacity, often associated with local suppliers due to the impact of crisis or weak economic situation in developing countries. The importance of these impediments was so high that local procurement impediments was ranked as the most important category of barriers based on respondents' preferences (see Figure 12.2). Based on the prioritization, it seems that humanitarian organizations procuring locally have to ensure that social issues such as child labor, unfair working hours, and unhealthy working conditions are not present in local suppliers' operations. This can be achieved through frequent supplier audits and evaluation. Moreover, the issues concerning cost, quality, and manufacturing capacity can be addressed through local capacity building and shifting towards longer-term constructive supplier development, rather than short-term intermittent procurement. For example, the relationship with a supplier of blankets or kitchen sets from which items were supplied for emergency situation, can be extended through long frame agreements for post-disaster procurement.

The second important category of barriers concerns the funding environment. Funding and donations are the life blood of humanitarian organizations that allow them to survive and sustain their operations. Donor requirements are considered as important mandates in humanitarian context. When donors have limited awareness or require little about sustainable procurement, it is often difficult to take sustainability into account for the humanitarian organizations. In addition, donors usually tie up their funding to special spent purposes which limits humanitarian organizations' flexibility to spend the donations elsewhere. This is known as earmarked funding and has been found to be negatively impacting humanitarian supply chain performance (Besiou, Pedraza-Martinez, & Van Wassenhove, 2014). Sustainability typically comes with a cost and when donors do not allow funds to be spent for sustainability or have little knowledge about it, integrating sustainability into procurement is far to achieve.



The third important category is supplier relationship management. Similar to commercial procurement, if buyer has a higher purchasing power over its suppliers, it would be more feasible to ask for sustainability requirements (Meqdadi, Johnsen, & Johnsen, 2018). The respondents believed that the most important barrier within this category is the low bargaining power of humanitarian organizations over suppliers of critical products. For some humanitarian products such as vaccines, sometimes humanitarian organization have few options for supplier selection which reduces the leverage they have over their suppliers and consequently the bargaining power for incorporating sustainability into suppliers' processes. Moreover, humanitarian procurement, in contrast to commercial procurement, is often based on shorter supplier relationships due to the emergency and intermittence inherent in the humanitarian context. Integrating sustainability into procurement processes often requires long-term collaboration with suppliers. As mentioned before, developing long-term supplier frameworks and continuing procurement after the emergency subsides, is a promising way for sustainable procurement in humanitarian supply chains.

The next important barriers within the category of supplier relationship according to the respondents' preferences is corruption in supplier selection and purchasing, especially in local offices purchases and extended humanitarian supply networks. The corruption in local offices' purchases can be tackled by increasing the visibility of headquarters over local offices' procurement. Some humanitarian organizations leave purchases below a financial threshold to local offices and do not bother to investigate such small purchases, increasing the risk of corruption for small purchases. Moreover, the extension of humanitarian supply chains to several tiers and echelons is an inherent humanitarian characteristic which makes it difficult for humanitarian organizations to track down the sustainability of indirect suppliers in the second tier and beyond. Use of non-coercive power such as rewards can contribute to dissemination of sustainability in indirect suppliers (Meqdadi et al., 2018).

The fourth and fifth categories belong to intra- and inter-organizational barriers ranked almost equally. Within an organization, managerial support and awareness is the most important driver of sustainable procurement. This result is supported by the seminal study of Walker and Brammer (2009) in for-profit organizations. Next barriers in the intra-organization category include "limited knowledge and training of procurement staff" and "higher cost of sustainable procurement". Both of these barriers are again associated with managerial commitment and interest in the sustainable procurement. By conducting employee training about sustainable procurement and willingness to spend more for sustainable products, managers can overcome these barriers on the way of sustainable procurement. Here, absence of pragmatic and clear guidelines to propel organization towards sustainable procurement plays a major role in holding back organizations from putting sustainable procurement into practice. However, the introduction of ISO 20400 on sustainable procurement, listed as an enabler by respondents, can help managers with a practical and implementable procedure. It should be noted that the standard is designed for for-profit organizations and its implementation in humanitarian procurement requires care in order to be aligned with humanitarian specificities and objective.

At inter-organizational and supply chain level, the respondents believed that there were more enablers than barriers. Humanitarian organizations can pool their resources for joint procurement and achieve sustainable advantages. Joint procurement seems more feasible in humanitarian procurement due to the similarity and standardization of many aid items. Unlike commercial procurement, the aesthetics of a blanket or food packaging is not a major concern for beneficiaries. This reduces the diversity of aid products and leads to higher similarity which facilitates joint procurement among different humanitarian organizations. It also increases the bargaining power over suppliers due to higher procured quantity and economies of scale. Another enabler at inter-organizational and supply chain level is that humanitarian organizations often copy their best practices through benchmarking. A successful sustainable procurement implemented in one humanitarian organization can be benchmarked and adopted by another humanitarian organizations quickly with little modifications due to similarity of context. The smaller size of humanitarian organizations community, compared to their commercial counterparts, and higher transparency in reporting makes such benchmarking practices more feasible.

Finally, the respondents ranked humanitarian specificities as the least important category. The reason behind this is the basis of pairwise comparison: respondents were asked to prioritize the categories based on the possibility to overcome the barriers in practice. Obviously, barriers such as urgency, time-pressure, and unpredictability of demand, while distinguishing humanitarian supply chains from commercial ones, are inherent in humanitarian supply chains and cannot be changed or eliminated. Therefore, there are less opportunities for aligning them in line with sustainable procurement. With regards to packaging material and higher packaging consumption in humanitarian setting, the use of technology can be helpful. For example, when humanitarian organizations perform airdrops in an afflicted area, they cover the items with extra packaging to prevent it from being torn open when hitting the ground. New technologies on the use of parachutes for such items is developing, but they are not yet financially justifiable.

By and large, our identified barriers and enablers are supported by the literature of humanitarian supply chains as impacting factors on the way of institutionalizing sustainability. The importance of local procurement for sustainability (Van Kempen et al., 2017), the role of training procurement staff about sustainability (Abrahams, 2014), negative impact of earmarked funds on sustainability (Kunz & Gold, 2017), and the impeding role of corruption in humanitarian procurement (Schultz & Søreide, 2008) are some examples of advocacy by extant literature.

## **12.6 Conclusion**

This paper unearthed and ranked the main barriers and enablers on the path of integrating sustainability to humanitarian procurement. The study offers several contributions to the literature of humanitarian logistics and supply chain management and to practitioners. First, sustainable humanitarian procurement is a nascent area of research and practice. In order to gravitate towards sustainability, it is imperative that the barriers and enablers in humanitarian context are duly identified. The identification and categorization offered by this study deepens the understanding of sustainable humanitarian procurement for

academics and sheds light on the specificities of humanitarian supply chains and how to deal with them to make humanitarian procurement more sustainable. Second, the application of group AHP and aggregation of preferences from several experts prevents from creeping subjectivity into the judgments made (Saaty, 1990) and ensures that the prioritization of barriers is sound, robust, and comprehensive enough to include all the procurement aspects.

Our work also offers valuable insights to practitioners. With sustainability moving to the center of attention for procurement practitioners, the main question for the integration of sustainability is simply “where to start from?”. The findings of this study can help humanitarian procurement staff to initiate their efforts for sustainable procurement from tackling the most important barrier categories and the main barriers within each category while benefiting the most from the identified enablers. Since the basis for the prioritization in this study was the possibility to overcome barriers in practice, it can help procurement managers to assign more resources to the barriers with higher importance which subsequently leads to the biggest improvement while refraining from spending resources on barriers with lower opportunities for improvement.

The study had its own limitations. It does not claim that the identification and ranking of barriers and enablers is comprehensive. Eliciting the ideas of different experts might return different barriers and enablers from the ones identified by this study. Moreover, humanitarian operations include a wide range of operations from mitigation, to preparation, response, and reconstruction (Van Wassenhove & Pedraza Martinez, 2012). In this study, we have not considered all the phases in the disaster cycle and focused merely on disaster response.

Sustainable humanitarian procurement is an overlooked area of research and offers promising future research. Some suggestion for future research specifically for barriers and enablers of sustainable humanitarian procurement are: eliciting the ideas of more experts, using other MCDM methods for prioritization, including enablers in the ranking, and studying the interdependence among barriers and among enablers. In the wider scope of sustainable humanitarian procurement, future research can adopt and contextualize the already existing sustainable practices in commercial setting for humanitarian procurement. Moving from conceptual studies towards more empirical studies in collaboration with practitioners is a dire need of humanitarian supply chain research.

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