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# Past, Present and Future of Humanitarian Supply Chain Management

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## **Research Needs in Humanitarian Supply Chain Management – practitioner insights**

### **Abstract**

**Purpose** - This paper analyses the development of humanitarian supply chain management theory since the mid 1990s in light of practitioner needs to name potential areas for future academic development, but also cross learning possibilities with the commercial sector.

**Design/ Methodology/ Approach** – A systematic analysis of academic literature was undertaken to identify key research areas to date. These findings were then compared to results from a focus group interview to reveal current gaps in research.

**Findings** – When comparing academic literature to current practitioner problems and practices academia seem to be missing important areas of development. It is necessary to not only consider the application of commercial supply chain techniques to humanitarian ones, but also to consider the unique setting and resource constraints aid agencies have to work with. However, much more work and research needs to be done to fill the gap of theory and practice in the humanitarian aid sector.

**Research Implications** – By assessing research that has been conducted to date and demonstrating the importance of it while showing future study needs we can further stimulate the academic community and attention in the field.

**Originality** - We highlight the need for more practitioner oriented academic research that reflects the realities of the aid sector. We thereby show crucial areas that have been overlooked by the academic community to date. Furthermore, we also reveal cross learning possibilities for the commercial sector.

**Keywords** – Supply Chain Management, Humanitarian Aid, Research

**Paper type** – Research Paper

## **1. Introduction**

Both natural and man-made disasters around the world have doubled in terms of their magnitude, frequency and impact (United Nations, 2006, International Federation of Red Cross and Red Crescent Societies, 2009). These trends have highlighted the need for better and more effective and efficient disaster response operations (Balcik and Beamon, 2008). Disasters seriously disrupt the functioning of society, and cause widespread human, material or environmental loss or damage, which is often of such magnitude that the affected areas cannot rely just on their own resources to manage their situations (United Nations, 1992). Relief operations to help effected communities involve substantial mobilization and deployment of material and financial resources, and supply chain management (SCM) effectively represents 80% of the response (Blecken, 2010, Van Wassenhove, 2006). Efforts to achieve appropriate media coverage, transparency and relief supply and rehabilitation are ongoing, but advancements in humanitarian SCM remain critical to the prompt alleviation of a disaster's impact (Sheu, 2007b). In response, humanitarian SCM research has grown; there is developing recognition of our academic responsibility to provide relevant research evidencing the value of SCM to humanitarian aid (HA) practices.

We contribute to this need for progress by providing a critical evaluation of the developments in the humanitarian aid SCM field since the seminal publication of Long and Wood (1995). We extend and add to Kovács and Spens (2011a) gap analysis between research, practice and education in humanitarian SCM and examine how theory has developed in light of the actual demands placed on organisations operating in the HA field. Therefore, we will compare themes identified in academic literature with findings from a focus group interviews conducted with people involved in HA work. This approach enables us to identify key practitioner issues not yet addressed in academic literature. Our research is not only important for HA theory and practice, but also to identify the potential for reverse transfer of knowledge. Valuable insights from this unique context (Bamberger and Pratt, 2010) can be gained, where resource constrained operations manage supply chains in high risk situations, providing guidance and direction to commercial SCM theory and practice.

Our paper is structured as follows: the next section will provide an overview of the methodology supporting our research. Following HA SCM literature is reviewed under four broad identified themes; we will present our detailed findings from the focus group interview and analyse them in light of the academic literature review. Finally, a conclusion will be

drawn based on identified areas for future academic research, but also possibilities of learning from HA for commercial businesses.

## **2. Methodological Approach**

To be able to compare academic humanitarian aid SCM research to practitioner needs we adopted a dual approach for this explorative project. Firstly, to ensure sufficient rigour and depth, we systematically identified and reviewed research papers on humanitarian aid SCM. We identified articles by accessing the contents list of each issue of the leading journals in the SCM sector. We then undertook a series of keyword searches in the major databases (Business Source Premier, JSTOR, Emerald and Google Scholar) using the terms “humanitarian” and “supply chain”; “disaster” and “supply chain”; “humanitarian” and “logistics”; and “disaster” and “logistics”. We cross validated our search results using a ‘snowball effect’, by checking the references in the identified papers. The literature survey initially focused on academic journals ranked in the Association of Business Schools (ABS)<sup>1</sup> system; the search was extended to capture special issues on humanitarian SCM in non ranked journals and articles published in the Journal of Humanitarian Logistics and Supply Chain Management. While many of the articles found in the search process were relevant to this research, we focused on those 89 papers that clearly linked *HA* work to SCM.

In a second step, we conducted a 180 minute focus group interview to identify major themes (Krueger, 1998) relevant to practitioners in the field of *HA* and commercial SCM as well as academics in the area (Rodrigues *et al.*, 2010). The chosen group composition reflects our interest of investigating the evolution of humanitarian SCM in practitioner and academic terms. To keep a balance of similarities and differences between participants that ensures an interactive group discussion (Rodrigues *et al.*, 2010) our focus group involved three non governmental organization’s (NGO) logisticians, three academics in the area of HA (one of them with a military background) and two commercial logisticians. This is within the recommendation for group size by Krueger (1998) to achieve an ideal level of data richness and group control. The focus group interview was recorded and transcribed verbatim (Miles and Huberman, 1994). All participants were given a final report on the interview and invited to comment on this summary to achieve a good level of credibility. While replication of the

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<sup>1</sup> The ABS Academic Journal Quality Guide is a hybrid based partly on peer review, partly on statistical information relating to citation, and partly upon editorial judgements following on from the detailed evaluation of many hundreds of publications over a long period.

results should be possible, the nature of the study limits the generalizability (Overstreet *et al.*, 2011).

In a third step we categorized all academic papers under the major themes (see Table 1) identified from the focus group interview:

- Defining HA SCM;
- Supply chain design;
- Effectiveness / Efficiency;
- Collaboration / Coordination.

Then, as found in our findings and analysis section practitioner needs were compared to academic literature under these themes to reveal the managerial relevance of research to date as well as to highlight critical areas that have been overlooked by the academic community. The following section outlines our literature search findings.

**Table 1** Main categories published (needs to be submitted separately)

Category	Authors
Defining HA SCM	Long and Wood (1995); Pettit and Beresford (2005); Van Wassenhove (2006); Altay and Green (2006); Kovács and Spens (2007); Sheu (2007b); Kovács and Spens (2009); Thévenaz and Resodihardjo (2010); Majewski <i>et al.</i> (2010), Kovács and Spens (2011a); Kovács and Spens (2011b); Sandwell (2011)
Supply Chain Design	Hwang (1999); Barbarosoglu <i>et al.</i> (2002); Özdamar <i>et al.</i> (2004); Beamon and Kotleba (2006); Yi and Özdamar (2007); Whybark (2007); Alsalloum and Rand (2006); Chang <i>et al.</i> (2007); Sheu (2007a); Yiu and Kumar (2007); Tzeng <i>et al.</i> (2007); Balcik and Beamon (2008); Tysseland (2009); Blecken <i>et al.</i> (2009); Pettit and Beresford (2009); Gatignon <i>et al.</i> (2010); Nolz <i>et al.</i> (2010); Sheu (2010); Taskin and Lodree Jr. (2010); Salmerón and Apte (2010); Banomyong and Spadang (2010); Rottkemper <i>et al.</i> (2011); McCoy and Brandeau (2011); Lodree (2011); Ben-Tal <i>et al.</i> (2011); Pedraza Martinez <i>et al.</i> (2011), Nolz <i>et al.</i> (2011), Ozdamar (2011), Besiou <i>et al.</i> (2011); Pazirandeh (2011); Chakravarty (2011)
Effectiveness / Efficiency	Oloruntoba and Grey (2006); Perry (2007); Beamon and Balcik (2008); Schulz and Heigh (2009); Van der Laan <i>et al.</i> (2009); Kumar <i>et al.</i> (2009); Kovács and Tatham (2009a); Tomasini and Van Wassenhove (2009); Tatham (2009); Trestrail <i>et al.</i> (2009); Kumar <i>et al.</i> (2009); Kovács and Tatham (2009b); Taylor and Pettit (2009); Kumar <i>et al.</i> (2009); Tomasini

	and Van Wassenhove (2009); McLachlin <i>et al.</i> (2009); Whiting and Ayala-Öström (2009); Beresford and Pettit (2009); Oloruntoba (2010); Jahre (2010); Choi <i>et al.</i> (2010); Ertem <i>et al.</i> (2010); Scholten <i>et al.</i> (2010); Kovács and Tatham (2010); Charles <i>et al.</i> (2010); Stapleton <i>et al.</i> (2010); Blecken (2010); Tatham and Houghton (2011); Bagchi <i>et al.</i> (2011); Falasca and Zobel (2011);
Collaboration / Coordination	Thomas and Fritz (2006); Carroll and Neu (2009); Balcik <i>et al.</i> (2009); Maon <i>et al.</i> (2009); Chandes and Paché (2010); Schulz and Blecken (2010); Jahre and Jensen (2010); McLachlin and Larson (2011); Tatham and Kovács (2010); Dowty and Wallace (2010); Ertem and Buyurgan (2011); Charles and Lauras (2011), Wild and Zhou (2011); Mohan <i>et al.</i> (2011)

### 3. Findings and Analysis

#### 3.1. Defining humanitarian SCM

The seminal work of Long and Wood (1995) provides the first overview of the sector and identifies the centrality of SCM to any relief operation. Humanitarian SCM is an umbrella term for disaster relief operations and long term support for developing regions. Disaster relief and development aid have an extremely close and complex relationship. Often losses from natural disaster often occur due to development initiatives that have been unsustainable, while disaster can whip out years of development in a matter of seconds.

Comparing humanitarian SCM to commercial SCM highlights its unique and complex nature as operations can be required anywhere in the world at anytime often in undeveloped regions with unsatisfactory infrastructure or a political instable climate, which may necessitate a combination of military and commercial applications (Long and Wood, 1995). Furthermore, there is a high level of invisibility striving from the inability to anticipate factors in terms of demand, supplies and assessment (Van Wassenhove, 2006). The overall aim is to rapidly provide relief, as it can be a matter of life or death, and to alleviate suffering during and after the disaster in affected areas.

However, the aid sector is often regarded as out of touch with current commercial management practices as it continues to consider logistics as a necessary expense rather than a key business function (Van Wassenhove, 2006). Similar to business logistics in the 1980s the function in the humanitarian sector is under-recognized, under-utilized and under-resourced (Jahre *et al.*, 2009). Modern SCM evolves around supporting the business strategy (effectiveness) at minimum cost (efficiency), while being prepared for disruptions and geared towards quickly restoring operations (resilience) (Gatignon *et al.*, 2010). This, literature contends, has not been assimilated by HA, at least not by those outside the logistics function.

### **3.2. Supply Chain Design**

Significant research has been undertaken to develop an optimum supply chain design for HA, although with the exception of work by Gatignon *et al.* (2010) studies have focused on critical aspects of the chain rather than adopting a holistic approach. It has been shown that the simulation of pre-existing disaster response models increases their validity and reliability (Banomyong and Sopadang, 2010). Different supply chain designs have been modelled to determine the optimum budgets for acquisition of assets (Salmerón and Apte, 2010, Tzeng *et al.*, 2007), levels of inventory and reorder points (e.g. Beamon and Kotleba, 2006, Taskin and Lodree Jr., 2010), number and locations of distribution centres and vehicles / helicopters in a relief network (e.g. Hwang, 1999, Chang *et al.*, 2007, Balcik and Beamon, 2008, Alsalloum and Rand, 2006), personnel allocation among the different locations (Yi and Özdamar, 2007), demand of affected people (Sheu, 2007a, Sheu, 2010, Chang *et al.*, 2007), resource distribution (Nolz *et al.*, 2010) and decisions regarding maintenance of equipment, spare parts inventory and the spare parts supply chain (Tysseland, 2009).

While these studies offer interesting insights and show the diversity of views in identifying critical factors for the complexity of HA supply chains, literature fails to provide a single model that can accommodate all variables in the supply chain design of disaster relief (Pettit and Beresford, 2005).

### **3.3. Effectiveness / Efficiency**

The increasing level and impact of disasters have led to growing recognition of the need for effective and efficient disaster response operations (Balcik and Beamon, 2008). Effective SCM can lead to cost savings, increased operational efficiency in the planning delivery and distribution of relief goods (Van Wassenhove, 2006), which can be the difference between life and death and the means to serving more people in need (McLachlin *et al.*, 2009). The four critical dimensions for effective and efficient humanitarian SCM are the processes and systems involved in mobilizing *resources, people and skills* and *(local) knowledge* needed during a disaster (Van Wassenhove, 2006) to assure quality of assistance (*performance measurement*).

#### **3.3.1. Resources**

Research highlights the stiff competition for funding between NGOs (Oloruntoba and Grey, 2009), often resulting in achieving solutions which appeal more to the donor than to the beneficiary (McLachlin *et al.*, 2009). Many HA agencies focus on short-term direct relief

rather than investment in systems and processes that will reduce expenses or make relief more efficient in the long term (Whiting and Ayala-Öström, 2009). Furthermore, donations are often earmarked for direct spending on materials and food, often at a particular location, rather than on critical but indirect services (Kovács and Spens, 2007, Long and Wood, 1995, McLachlin *et al.*, 2009).

Therefore, investments in research, warehouses, training of personnel, information systems, infrastructure and other long-term assets are restricted (Blecken *et al.*, 2009, Kovács and Tatham, 2009b), which are of crucial importance not only to prepare for a disaster, but for effective and efficient SCM. However, the lack of funding for infrastructural resources raises particularly interesting questions about the ability of the HA sector to adopt commercial SCM practices which rely heavily on sophisticated technology and communications. For example, Taylor and Pettit (2009) investigate the notional applicability of lean logistics techniques such as value chain analysis to the requirements of HA supply chains, discussing the theoretical basis for its use and how it could be used to improve efficiency and effectiveness.

### 3.3.2. *People and skills*

Knowledge and competencies residing within employees is one of the most critical resources for any organization (Hitt *et al.*, 2006). However, HA organisations are restricted in planning and organizing their employee base (Pettit and Beresford, 2009) due to high staff turnover and a limited supply of qualified and readily deployable personnel in the sector (Tomasini and Van Wassenhove, 2009). In addition, pressure to maintain administrative expenditures at a minimum, leaves HA employees and volunteers with little opportunities to learn new skills and competencies or track down resources to improve processes (Kumar *et al.*, 2009). Nevertheless, HA organisation can learn by reflecting on previous operations and use that gained knowledge in preparing for the next one or in geographical regions with re-occurring disasters (Kovács and Tatham, 2009b).

### 3.3.3. *Local knowledge*

Research has focused on how working with local communities can lessen the impact of disasters (Perry, 2007) as well as the benefits of their involvement in planning and decision making. A case study by Oloruntoba (2010) shows that preparedness, pro-activeness and readiness of the authorities and local communities were major success factors that critically and positively impacted the efficiency and effectiveness in the operations following Cyclone Larry in Australia. In contrast to Australia, the Asian tsunami demonstrates the consequences

of failure to develop government response plans and preparedness strategies (Beresford and Pettit, 2009).

#### *3.3.4. Performance measurement*

Performance measurement in the HA sector is particularly difficult due to the intangibility of services, immeasurability of organizations' mission, unknown operational outcomes and the variety, interests and standards of stakeholders (Beamon and Balcik, 2008). The development of relevant performance measurement can help HA actors in their day to day decision making, improve the effectiveness and efficiency of HA SCM while increasing transparency and accountability of operations (Beamon and Balcik, 2008). It can also enable monitoring of progress, standardisation of processes and easier identification of development needs for the creation of concrete action steps (Schulz and Heigh, 2009).

#### **3.4. Collaboration / Coordination**

The ability of HA agencies to work together and develop a collective strategy has a huge influence on the success or failure of the disaster response (Chandes and Paché, 2010). HA literature recognises that the ultimate task for any humanitarian supply chain manager is to find collaboration partners (Kovács and Spens, 2009) with which equipment, assets, resources and critical information can be shared (Maon *et al.*, 2009).

The humanitarian relief environment is particularly complex, incorporating the often unstable, potentially hostile host governments, the military, international and local relief organizations and private sector companies bringing together many different interests, mandates, capacity and logistics expertise (Balcik *et al.*, 2009). This makes the coordination of those involved in the network a major challenge (Jahre *et al.*, 2009) as boundaries of the establishment of trust in relationships clearly exist (Tatham and Kovács, 2010).

The HA community has developed various committees and offices and deployed various programs to improve and simplify the collaboration and coordination within the sector (Balcik *et al.*, 2009). These make it possible to set up the supply chain infrastructure before a disaster happens to establish readiness for coordination (Schulz and Blecken, 2010).

### **4. Findings and Analysis**

#### **4.1. Defining HA SCM**

##### *4.1.1. Top Management Recognition*

As the number, magnitude and complexity of emergencies continues to increase, SCM has to adapt to meet these new challenges (Beamon and Kotleba, 2006); the recognition of the role

of SCM in the delivery of HA can be seen as a pre-requisite (Whiting and Ayala-Öström, 2009). Still, our focus group indicates that *“one of the core issues is the need for the NGO sector to turn around and see SCM within Senior Management of organizations, to see it as a strategic aspect of the business of the sector”*. In some of the bigger humanitarian organizations senior management has recognized the efficiencies that can be gained through effective SCM at the head office basis. Nevertheless, things are different on the country level. *“I have yet to see an organization in the assessment process making sure that the logistics person is part of that assessment.”*

Academic literature has highlighted this lack of recognition since 1995 (Long and Wood) continuously to date (e.g. Perry, 2007, Van Wassenhove, 2006, Maon *et al.*, 2009, Pettit and Beresford, 2005, Kovács and Spens, 2011a). Research needs to keep on highlighting the benefits of SCM to top managers in HA as looking back at the commercial sector, the acknowledgement of SCM as a key strategic function didn't happen over night but only through continuous academic and practitioner recognition.

#### *4.1.2. Sustainability of operations*

Sustainable relief operations and their management involve a continuum of inter-linked activities (Pettit and Beresford, 2005) that consist of the four disaster phases: preparedness, immediate response, reconstruction and mitigation, which are all of equal importance. Whereas donors focus on the immediate response phase and academic literature emphasizes the preparation phase (Kovács and Spens, 2007), for practitioners the *“main goal is reconstruction and development”*. Furthermore, *“disaster risk reduction is taken on by most organizations [...] to reduce the potential impacts of a disaster in a country where you know it is going to happen re-occurringly”*, which is part of the mitigation phase, isn't addressed by academic humanitarian SCM literature at all. However, the essence of mitigation is the link between disaster and development aid. Contradictory to our focus group results, which show that *“the majority of work is long term development work”* the number of publication dealing with development aid only accounts for 31% of our search results. This highlights a crucial need for research into the mitigation of disaster e.g. through risk management and / or development side of operations. Only then literature can contribute to and support sustainable and therefore long term HA.

#### **4.2. Supply Chain Design: Vertical integration**

In commercial supply chains the main aim is to reach customer satisfaction. It is the reverse

flow of information from the consumer or localized partners that initiate all other actions taking place in the supply chain. Many aid organizations have extended their supply chains to include local partners and consumers following the *“push towards more local level involvement and particularly beneficiary accountability”* as opposed to donor satisfaction. Our interview indicates that these local partners can help to identify information on regional infrastructure and population characteristics in the initial assessment stages when a supply chain has to be set up quickly. This is especially important for NGOs as they go the extra mile away from the major cities, whereas UN agencies tend not to. *“In the countries NGOs do work in, even within small distances different tribes have different needs from food or shelter etc.”*

However, local partners often represent the weakest link of the supply chain, and a supply chain can only be as good as its weakest link, hindering progress that could be made. The capacity for growth of many local partners seems to be quite limited. Therefore, it would be important to investigate *“the impact and associated risks regarding capacity and systems”* of local partners managing an increase by 100 per cent or more in their spending or resources.

Humanitarian SCM literature with the exception of Oloruntoba and Grey (2009) and Kovács *et al.* (2010) solely focuses on the aid organizations and their supply chain, not considering the role of the beneficiary (consumer) that should drive any supply chain operation. This highlights a gap between what is considered best practice – *“We should all be working more through local partner and local NGOs”* – and academic research focus. Benefits and risks regarding this extension of the supply chain need to be considered.

### **4.3. Effectiveness / Efficiency**

#### **4.3.1. Resources**

At the onset of a disaster many aid organizations race to be the first to deliver aid without having undergone a proper assessment of needs, as this would delay the arrival of goods (Long and Wood, 1995). Competition between agencies and pressure from the media to as well donors to be seen quickly have led to a push system in aid delivery after a disaster. *“One of the big risks within our supply chain is that we are subject to a push rather than a pull system.”* This is an inefficiency that has not been mentioned in academic literature. Therefore, there is a need and responsibility to highlight the consequences of operating a push system and outline the benefits of a pull system in HA research.

#### **4.3.2. People and skills**

As most available resources go into visible aspects of SCM e.g. deliver of aid there is a lack of learning resulting in staff with little / not enough competencies (Maon *et al.*, 2009). However, *“people need to be highly skilled to do the work”*. Often, if new capacities are built through training, skilled staff move on to better paid jobs in larger organizations within the sector taking with them important knowledge. *“Staff turnover is a huge issue for us, medium size NGOs in general. It is quite difficult to retain highly skilled staff because of the competition with UN and some of the other bigger organizations.”*

Even though aid agencies *“try to have systems and procedures in place that are sustainable, so that they are not tied to any one person”*, knowledge management and retention is a big organizational practitioner problem in the humanitarian sector that has not been address by any research. Academia has the potential resources to investigate systems and methods that could improve knowledge development and retention for HA agencies by looking at learning possibilities from the commercial sector. That would also simplify the transfer of knowledge from the HA to commercial businesses. As humanitarian organisations are frequently operating in environments with a high degree of uncertainty (Charles *et al.*, 2010) there is a lot to be learned for commercial SCM theory and practice in relation to risk and resilience.

#### 4.3.3. Local Knowledge

Supply chain planning in a disaster situation or development aid should make sure that the primary information source is local personnel and expertise, as they have knowledge of the environment, culture and standards that help to make aid sustainable. *“In the development programmes you are trying to build sustainability into it through a country or people [...] so your concepts are coming from there.”* Working with local communities prior to an emergency can lessen the impact of disasters (Perry, 2007) as well as benefit sustainable planning and decision making in the immediate response and reconstruction. *“In the reconstruction phase in the Kosovo houses were engineered. However, the problem was that they were constructing to the standards of the western world vs. the standards of the country.”*

Academic research can support the use of local knowledge in HA by investigating what benefits a decentralized bottom up approach of planning and decision making can bring about. These benefits will not only apply to local communities as aid given to them will be more sustainable, but also the aid organization as cost savings could be achieved due to more efficient management of resources.

#### 4.3.4. Performance Measurement

Although performance measurement is known to be crucial for improvements, research to date provides little insight into how effective indicators can be selected in the humanitarian context (Van der Laan *et al.*, 2009). *“It is inherently difficult to establish KPIs”* (Key Performance Indicators) and have common measurement metrics across the HA sector, because programmes differ to a large extent according to the core competencies of an organization. NGOs are measured from their donors based on what was set out in the proposal and what was actually achieved even though *“the ultimate KPI is beneficiary satisfaction [...] and impact evaluation”*.

However, there is a Humanitarian Accountability Partnership that agencies can sign up to. *“It measures you and ensures that you have mechanisms in place that will guarantee that you are fully accountable to your beneficiary.”* Research into the impact and effectiveness and efficiency of that programme is missing. Academic literature has not mentioned this programme at all, even though they could contribute to establishing KPIs and performance measurements in relation to that programme. Also the exploration of internal measurements as used in the commercial sector (*“I would always measure against yourself [...] a lot of industries would do that to check if they have improved.”*) could help aid agencies to move forward.

#### 4.4. Collaboration / Coordination vs. Independence

During the Tsunami in Indonesia a lot of agencies kept their independence and worked separately as there was a lack of coordination (Thévenaz and Resodihardjo, 2010), which led to things going drastically wrong. With that lesson learned a humanitarian reform process took place leading to the clusters approach which tries to address the issue of bad coordination and collaboration by establishing certain standards (Jahre and Jensen, 2010).

However, *“there is a push from the United Nations reform process that there should be better collaboration and cooperation among aid actors”*, it is important for them to keep their independence as shown after the earthquake in Haiti, where most of the United Nations infrastructure destroyed after the earthquake in Haiti; they could not take on their lead role as coordinator straight away. *“Our independence was absolutely crucial, because of the lack of ability of getting support from the United Nations and because of the slowness of establishment of the coordination mechanisms.”* This indicates that while progress has been made regarding coordination, the structure and organization of it is very fragile, necessitating clear procedures with option thinking, which academic research can contribute an important

part to.

Furthermore, the potential difficulties of the HA agency in collaborating provide a microcosm, a hothouse, for examining the range and potential remedies for commercial collaborations. This is a potentially rich vein of literature for applying to SCM. Don't know whether this should be here or later.

## 5. Conclusion

The review of humanitarian SCM literature shows an increase in the recognition of the importance for it. We have contributed to the need for more research in the area by identifying gaps in academic HA SCM literature with an underlying practitioner need. Therefore, we add to the crucial knowledge flow from practitioners to academics which is critical in the development to management theory (Bamberger and Pratt, 2010). Areas that need to be addressed in further research are in relation to sustainability of HA operations, vertical supply chain integration, knowledge management practices, performance measurement systems and consequences of bad SCM practices. However, we also highlight the possibilities for commercial organizations to learn from the HA sector in relation to risk (mitigation and resilience) and uncertainty as well as collaboration. In the end knowledge and learning cannot be seen as simply supplied from one business to another or from a rich country to a poor, but as an iterative process of collaboration and knowledge sharing between supply chain members in different sectors.

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