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Knowledge Sharing in Relief Supply Chains

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Both authors are also founding members of the HUMLOG group, the aim of which is 'To research the area of humanitarian logistics in disaster preparedness, response and recovery with the intention of influencing future activities in a way that will provide measurable benefit to persons requiring assistance'.

ABSTRACT

Relief supply chain management is gaining rapidly more interest in academia at the same time as the number of actors in humanitarian aid and the number of natural disasters increase. In order to bring relief to beneficiaries, co-operation between relief supply chains as well as within supply chains is needed. However, at the same time as co-operating, many of the actors in the supply chains compete for the same financial resources in terms of donations. Therefore, cooperation as well as competition, i.e. co-opetition, are evident features in relief supply chains, which impact on the incentive to share knowledge among actors. This paper therefore aims at increasing the understanding of knowledge sharing in and between relief supply chains. The importance of communities of practice is highlighted in this context, shedding light on the way knowledge sharing is taking place across relief supply chains. After discussing existing communities of practice, suggestions are made for how these can be used to enhance knowledge sharing. The paper concludes with avenues for further research.

Keywords: knowledge transfer, knowledge sharing, supply chain collaboration, co-opetition, relief supply chains, communities of practice

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1 INTRODUCTION

In supply chain management and logistics, academic literature has had a clear focus on for-profit organisations, while NGOs and not-for profit organisations have received scant interest. Lately, this trend has somewhat turned and studies of formerly unexplored areas and sectors such as health care and humanitarian logistics (Beamon and Kotleba 2006a, Kovács and Spens 2007, Oloruntoba and Gray 2006, Thomas and Fritz 2006, van Wassenhove 2006) are being presented. What these two fields have in common is the ultimate goal, i.e. to save lives, which makes them interesting but also challenging. In contrast to the commercial sector, making profit is not the ultimate goal; however, in order to save more lives, resources need to be spent wisely. There have therefore been repeated calls to avoid a duplication of efforts in and between relief supply chains, and rather co-operate and share knowledge in delivering aid (Oloruntoba and Gray 2006, van Wassenhove 2006). Yet, humanitarian organisations also compete for e.g. funding. Thus relief supply chains are confronted with forces of co-operation and competition at the same time, both impacting on their abilities to share knowledge. Co-operation and competition have received interest in supply chain management (SCM) due to their expected outcomes on performance, however, the concept of co-opetition, the joint occurrence of collaboration and competition, in the supply chain has not received broad attention (Kotzab et al. 2006, Luo et al. 2006). This paper therefore aims at increasing the understanding of knowledge sharing in and between relief supply chains.

The paper is laid out as follows: Beginning with a sequential literature review, first relief supply chain management literature is revisited, before turning to supply chain collaboration literature in the light of competition. Subsequent sections examine the question as to ‘what constitutes knowledge’ in the context of relief supply chains, and which factors of competition and co-operation inhibit or facilitate knowledge sharing. A closer examination of co-operative factors leads to discussing different types of communities of practice as knowledge sharing platforms in the context of relief supply chains. This is followed by a presentation of existing communities of practice, before presenting concluding thoughts and avenues for further research.

2 RELIEF SUPPLY CHAIN MANAGEMENT

Arguably the most flexible, responsive, and indeed agile supply chains are those dealing with disaster relief (cf. Long 1997, Oloruntoba and Gray 2006). They need to react quickly to sudden (largely unpredictable) occurrences, and their failure is measured in the loss of lives. As Thomas and Fritz (2006) argue, they constitute a rapidly growing ‘industry’. Long and Wood (1995) highlight their importance by stating that nearly each government in the world is involved in relief supply chains as either donor or recipient – or sometimes even as the agent delivering the items.

What is clear is that relief supply chains and humanitarian logistics per se, differ from their commercial counterparts. A set of characteristics that set relief supply chains apart from commercial ones can therefore be identified (see Table I). In terms of the end-result, supply chains in the business arena aim at increasing profits whereas in the humanitarian arena aim at alleviating the suffering of vulnerable people (Thomas and Kopczak 2005).

Table 1 Characteristics of relief supply chains

	<i>Relief supply chains</i>
<i>The main aim</i>	Save lives, alleviate the suffering of vulnerable people
<i>Actor structure</i>	Stakeholder focus with no clear links to each other, dominance of NGOs and governmental actors
<i>3-phase setup</i>	Preparation, immediate response, reconstruction
<i>Basic features</i>	Variability in supplies and suppliers, large-scale activities, irregular demand, and unusual constraints in large-scale emergencies
<i>Supply chain philosophy</i>	Supplies are “pushed” to the disaster location in the immediate response phase. Pull philosophy applied in reconstruction phase
<i>Transportation and infrastructure</i>	Infrastructure destabilised and lack of possibilities to assure quality of food and medical supplies
<i>Time effects</i>	Time delays may result in loss of lives
<i>Bounded knowledge actions</i>	The nature of most disasters demands an immediate response, hence supply chains need to be designed and deployed at once even though the knowledge of the situation is very limited
<i>Supplier structure</i>	Choice limited, sometimes even unwanted suppliers
<i>Control aspects</i>	Lack of control over operations due to emergency situation

Source: Modified from Kovács and Spens (2007, p.108)

The supply network structure of relief supply chains also differs in that it is comprised of many different actors with no clear or stated linkages to each other (Oloruntoba and Gray 2006), ranging from humanitarian organisations (aid agencies and non-governmental organisations) to donors, governments and the military, to (commercial) suppliers and third party logistics providers (Kovács and Spens 2007). While operations and actors are intertwined, different groups of actors and different phases of disaster relief operations can be distinguished; the preparation phase, the immediate response phase and the reconstruction phase. Among these phases, up to 2005 academic research focused on preparedness, though recently also the immediate response phase has received some more attention (Kovács and Spens 2008).

Most natural disasters are unpredictable, thus such is the demand for goods in these disasters, whereby the immediate response stage usually involves a large amount of supplies being pushed to the disaster location (Long and Wood 1995). Due to a lack of demand data, humanitarian organisations in fact act as a proxy of the needs of beneficiaries until they can assess their needs more accurately (Tatham and Kovács 2007b). The business arena usually deals with a predetermined set of suppliers, manufacturing sites, and stable or at least predictable demand – all of which factors that are unknown in the humanitarian arena (Cassidy, 2003). Relief supply chains are characterised by large-scale activities, irregular demand and unusual constraints in large-scale emergencies (Beamon and Kotleba 2006b). They often have to be carried out in an environment with destabilised infrastructure (Long and Wood 1995, Özdamar et al. 2004) ranging from a lack of electricity supplies to limited transport infrastructure. The time effects of delayed operations, as seen for example in the recent case of Cyclone Nargis in Burma/Myanmar in 2008, can lead to even more victims than the original disaster. Time is therefore highly critical in relief supply chains (Zhang et al. 2002).

Decisions in relief supply chains are made under constraints of limited information, or even misinformation (King 2005). At the same time, even the knowledge of other humanitarian organisations in a region is limited (de Vasconcelos et al. 2005, Perry 2007). What is more, this also delimits the knowledge of suppliers, and incoming supplies to a particular disaster. Even though humanitarian organisations employ framework contracts with suppliers of e.g. tents, supplies are still limited if several organisations have a framework contract with the same supplier without being aware of the suppliers' relationships to them as well as others. Supplies are not only

unpredictable, but in some cases unsolicited – leading to port and airport congestions, wrong items in a disaster region etc. (Pettit et al. 2006). The complexity of the actor structure, unpredictability of demand and supply, as well as the urgent needs of beneficiaries in an environment with limited technical availabilities leads to a general lack of control in relief supply chains – which would be particularly crucial in inventory management; see Beamon and Kotleba's inventory control research in the Sudan (2006a and 2006b). A lack of control in the humanitarian arena does, however, also refer to loss of control of items due to political instabilities – again, the situation of Cyclone Nargis can be quoted, where the political power took over the control of relief items at the border.

Research on relief supply chains is a rather new area; still in 2005 there were only a handful of articles to be found on the topic (Kovács and Spens 2007). Having said so, a trend can be detected towards the foundation of new research groups and ultimately, a rise in numbers of publications dedicated to this field. To date, much of operational research has looked at particular regions and/or disasters, though most of the articles remain on a conceptual level. Some, however, apply their models to historical data sets (Chang et al. 2007; Díaz et al. 2007; Pettit and Beresford 2006; Tatham 2007, Weerawat, 2007). Lately, the trend in research has been towards an increased focus on the immediate response phase (away from the preparation phase) of a disaster (Kovács and Spens 2008), some even focusing on reconstruction and questions of continuous relief (Blecken and Hellingrath 2007, McLachlin et al. 2007, Salam 2007). According to Kovács and Spens (2008) revisited review of the literature, raising topics include the use of technology in disaster relief (Tatham 2007), questions of local versus global sourcing (Jahre and Spens 2007, Skoglund and Hertz 2007), as well as performance measures in disaster relief (de Brito et al. 2007, Schulz and Heigh 2007). On a more conceptual level, Oloruntoba and Gray (2006) discuss relief supply chains in terms of leanness and agility. Others present general frameworks, e.g. Rodman's (2004) framework of SCM solutions to overcome logistics difficulties during relief operations, Pettit and Beresford's (2005) procedural decision-making model for emergency relief logistics, van Wassenhove's (2006) disaster relief taxonomy, or Kovács and Spens' (2007) framework for disaster relief logistics.

A commonality of all this research is the criticism of relief supply chains for their lack of co-operation, and indeed, lack of knowledge sharing. But while Tomasini and van Wassenhove (2004) addressed the problem of different political agendas of relief

supply chains, literature has largely neglected the competition between humanitarian organisations. As for the question of knowledge sharing, it is surprising how little literature there can be found with a focus on humanitarian organisations – and even less with a focus on relief supply chains, in spite of Adinolfi et al (2005) (self-)criticising humanitarian organisations in an OCHA report for stockpiling but not sharing knowledge. Albeit sharing the same goal to deliver aid to vulnerable people (the beneficiaries), save lives and alleviate suffering, humanitarian organisations compete for donations, i.e. their financial resources, and even media exposure. Therefore it is important to include the discussion on competition among relief supply chains when looking at their possibilities for sharing knowledge.

3 COMPETITION AND CO-OPERATION IN SUPPLY CHAINS

Examining the competition between firms has long been at the core of economics as well as management. Yet it is not firms in isolation that compete, rather, competition occurs between supply chains (Christopher, 1992). Interestingly, while this focus on competition has been postulated by Christopher in 1992, it is the concept and degrees of co-operation that is of core importance to supply chain management (SCM). Varying degrees of co-operation are means to achieve an advantage in a competitive situation (Barratt 2004). Supply chain management (SCM) literature therefore does not only examine aspects of competition and co-operation, but distinguishes between different forms and levels of intensity of the latter.

Co-operation in the supply chain can take many forms, from contractual control mechanisms to common standards and performance systems, information sharing, joint planning and decision-making and process integration (Fawcett and Magnan 2002, Lambert et al. 1998, Lambert 2004, Min et al. 2005, Simatupang and Sridharan 2005). Process alignment, sharing of resources (including information), and the frequency of exchanges all contribute to intensifying the co-operation in the supply chain. While all authors acknowledge the existence, and co-existence, of different forms of co-operation, some use different labels for different degrees of intensity while others distinguish between basic to advanced 'collaboration'. According to the first group of authors, supply chain collaboration is set on a higher level than mere co-ordinating mechanisms of transactions, exchanging basic information on price and delivery schedules, surpassing functional and process integration in the supply chain. Supply chain collaboration is thus, characterised by mutual trust, relationship-specific investments, sharing risks and rewards, and long-term thinking (Fawcett and Magnan 2002, Matopoulos et al. 2007, Min et al. 2005, Simatupang and Sridharan 2005, Spens and Bask 2002). Related to the supply chain management framework, there is a strong procedural focus. Trkman et al. (2007) thus distinguish between different levels of maturity in SCM depending on the ways of process integration. Only the highest ('extended') maturity level facilitates competition to take place between different supply chains (Trkman et al. 2007). In this competition, success or failure of the supply chain is linked to the degree of resource sharing among partners, resources being information, knowledge, and skills (Fawcett et al. 2008). Pursuing only self-interests of a company thus can 'hurt' the supply chain and lead to lower performance (Arshinder and Deshmukh 2007). Generally, the claim is that (intensified) supply chain

collaboration can lead to improved performance, and ultimately, competitive advantage (van der Vaart and van Donk 2008), or indeed an increase in shareholder value (Mitra and Singhal 2008).

The second stream of literature focuses on different degrees of intensity in co-operation for another reason; setting apart which particular suppliers and customers a company should engage in intense collaboration with, while only exchanging basic information related to particular transactions with others (Barratt 2004, Kampstra et al. 2006, Skjøtt-Larsen et al. 2003, Whipple and Russell 2007). For this stream, 'collaboration' can signify any degree of intensity of co-operation, rather distinguishing between 'basic', 'developing' and 'advanced' collaboration (Skjøtt-Larsen et al. 2003); arms-length collaboration to partnerships (Kampstra et al. 2006), or between type I collaboration to manage transactions, type II for managing events, and type III for process management (Whipple and Russell 2007). Even in type I collaboration, the focus is on specific mechanisms for e.g. managing material flows related to maintenance and repair operations – which are related to infrequent transactions and non-critical materials. One of the reasons cited against increased degrees of collaboration is in fact competition in a dynamic market, where executives might fear to delimit their responsiveness if increasing collaboration (Kampstra et al. 2006).

Yet both streams of literature have a common view on the facilitators of collaboration in the supply chain, and that increased collaboration can lead to better performance. Moreover, both streams concur in the sharing of resources (information, knowledge and skills – Fawcett et al. 2008) being an important facilitator of collaboration. Generally, facilitators can be grouped into attitudinal, pattern and practice factors of supply chain collaboration (van der Vaart and van Donk 2008). Attitudinal factors of collaboration include relationship-building, quality and commitment, as well as social bonding, trust, and the distribution of responsibilities. Pattern factors relate to the ways decisions are made, and infrastructural factors of e.g. supplier development. Practice factors encompass capabilities and process orientation. Interestingly, information sharing has an attitudinal, pattern, as well as practice dimension. The frequency of information exchanges relate to patterns, the systems used and their relation to processes to practices – but importantly, if the relationships in the supply chain are not built on trust, a negative attitude towards other actors can be the single-most inhibitor of supply chain collaboration (van der Vaart and van Donk 2008). Lack of trust and thus, information exchange is also one of the barriers of collaboration

identified by Fawcett et al. (2008), who conclude that 'absent a willingness to cooperate, a supply chain will not be able to attain lower costs and higher returns on investment. Further, irregular collaborative meetings among chain partners hinder managers' opportunities to share with one another concerns, weaknesses and best practices' (p.37). Frequent meetings with other actors are key to any learning occurring in the supply chain, which in turn is linked to achieving higher performance (Arshinder and Deshmukh 2007). Thus knowledge sharing in the supply chain is linked to the benefits of improved clarity and accuracy of information, improved responsiveness, reduced inventory costs and lead-times, and reduced stock-outs (Arshinder and Deshmukh 2007), which all contribute to higher performance. However, the sharing of resources such as knowledge require the establishment of joint teams as well as joint performance evaluations, i.e. the establishment of an incentive system to facilitate knowledge-sharing. Fawcett et al. (2008) highlight the importance of people empowerment and alliance design as facilitators (or 'bridges') of supply chain collaboration.

4 KNOWLEDGE SHARING IN RELIEF SUPPLY CHAINS

Knowledge in an organisation contains the collection of expertise, experience and information that individuals and workgroups use during the execution of their tasks. It is produced and stored by individual minds, or implicitly encoded and documented in organisational processes, services and systems (de Vasconcelos et al. 2005). Different from information – which can be defined as a flow of messages – knowledge has an aspect relating to human action, i.e. the creation and organisation of the very flow of information (Nonaka 1994:15). Zhang et al. (2002) discuss the differences between data, information and knowledge in the humanitarian context; ‘data’ referring to raw data without any processing, out of context and with no meaningful relation to anything else, while ‘information’ entails an understanding of the relations among humanitarian assistance, or disaster relief-related data. A particular problem of relief supply chains is the abundance of information, and misinformation at times of a disaster (King 2005). Some of this misinformation might be intentional, e.g. if organisations and/or governments publish high estimates of affected people in a disaster in order to inflate the donor response to the disaster; or, on the opposite end, if governments conceal information as to not appear vulnerable (King 2005). ‘Knowledge’ in relief supply chains thus refers to disaster mitigation strategies, past experiences in disaster relief, cases, solutions etc. (Zhang et al. 2002) and to the contextualisation of information and even misinformation for any given disaster, i.e. its credibility and currency (King 2005).

Crucially, knowledge is not only created within but also across organisations (Teece et al. 1997). The latter involves intentional as well as unintentional inter-organisational knowledge sharing (Garavan et al. 2007). In the business arena, managing knowledge in- and across companies has been linked to the creation of competitive advantage (Loebecke et al. 1999). Choi and Lee (2002) even state that without a constant creation of knowledge, firms are condemned to poor performance. Nevertheless, even if co-operation increases a firm’s performance, firms would rather not share knowledge if they feel that what can be gained by co-operating is outweighed by losses from giving up the monopoly over the knowledge. The issue then becomes one of co-opetition, i.e. simultaneous co-operation and competition between organisations. Co-opetition entails sharing of knowledge in order to gain competitive advantage, but the paradox is that the knowledge shared might be used for competition (Loebecke et al., 1999).

Managing knowledge in humanitarian aid is of utmost importance as it actually contributes to saving lives. In the humanitarian area, knowledge is widely distributed and owned by different organisations (Zhang et al. 2002). Furthermore, humanitarian interventions require specialised expertise of individuals, while simultaneously being a participative undertaking (Adinolfi et al. 2005, de Vasconcelos et al. 2005, Perry 2007). Tomaszewski et al. (2006) go as far as to call for a common group operating picture including a command structure in the humanitarian context. Yet for reasons of competition as well as the distribution of power among humanitarian actors it is not possible to establish a clear command structure across different actors involved in disaster relief. Albeit humanitarian organisations acknowledge a need for closer collaboration – or at least, co-ordination – few humanitarian organisations want to be co-ordinated. Thus there is interplay between competition across relief supply chains and pressures to co-operate. While knowledge can of course be shared within a relief supply chain, the criticism towards humanitarian organisation doesn't stem from a lack of supply chain collaboration but rather from a lack of knowledge sharing in the competitive dimension. Therefore, competition-based barriers of knowledge sharing are the more important in relief supply chains. In spite of such pressures towards co-operation across relief supply chains, the competitive dimension needs to be analysed as well. When talking about supply chain collaboration, the competitive dimension is lifted up as a matter of gaining competitive advantage over other supply chains (cf. Barratt 2004), or to determine which type of collaboration should be preferred in order to increase supply chain responsiveness (cf. Kampstra et al. 2006) and thus, improve supply chain performance (Whipple and Russell 2007). An important notion of supply chain collaboration is that only pursuing the self-interests of a company can affect supply chain performance negatively (Arshinder and Deshmukh 2007). The very same argument can be used in relief supply chains as an incentive to collaborate with competitors, i.e. not just within but rather across relief supply chains.

4.1 Competition as a barrier to knowledge sharing

The structure of the supply network in relief supply chains is the single most contributor to aspects of competition. Supply-related competition relates to access to donors and suppliers, i.e. the resources of the relief supply chain. Questions of market share are on the other hand mediated by media disposure. Thus when it comes to relief supply chains, the supply chain vs. supply chain notion of competition is particularly evident when it comes to donor and media relations, though Long and Wood (1995)

also discuss a competition for limited resources. Donors are the providers of financial means as well as to some extent, materials in the relief supply chain. Interestingly, while consumers are an important part of donors, and humanitarian organisations collect money and materials from a large number of individuals, this is but a part of donor relations. Governments and government-related funds make up a substantial part of donors (Long and Wood 1995). In the case of these donors, humanitarian organisations compete for a share of a limited amount of funding. The media is seen as an important stakeholder of relief supply chains (Heaslip et al. 2007, Kovács and Spens 2008, Tatham and Kovács 2007b), and differences in media exposure can lead to disasters being over-exposed or indeed ‘forgotten’. Thus, media exposure of different disasters can be both a facilitator and inhibitor to donor relations, not only in the case of individual donors but also to highlight the need of populations to donor governments. Consequently, humanitarian organisations compete for media attention, and indeed have started to ‘manage’ their relations with the media (Payne 1994) to gain access to different financial as well as material resources. Furthermore, it limited resources also refer to the capacities of e.g. transportation providers as well as the recipient transport infrastructure at the time of a disaster.

Such competitive factors are crucial inhibitors of knowledge sharing in relief supply chains. However, apart from inhibiting factors directly linked to competition, one can also here distinguish between attitudinal, pattern and practice factors of both barriers and bridges to knowledge sharing in relief supply chains (comp. Fawcett et al. 2008, van der Vaart and van Donk 2008). A lack of trust is evident across humanitarian organisations; the more, Pettit et al. (2006) cite a lack of willingness of humanitarian organisations to consider approaches of other aid agencies or of the business community as a co-operation barrier. What is more, the mere awareness of each other’s existence in a region might be lacking (Perry 2007). Too often NGOs that work in the same country or region are not aware of each others organisational purposes, projects and activities (de Vasconcelos et al. 2005). This is hardly surprising given the diversity of humanitarian organisations. Key actors in relief supply chains consist of aid agencies, international governmental organisations and non-governmental organisations. But even other actors such as (commercial) third party logistics providers (TPLs), military organisations etc. are active in the arena of humanitarian aid (Kovács and Spens 2007). Also the scenarios of delivering relief differ substantially and vary from long-term relief, famine and resettlement activities, rehabilitation and development programmes to disaster and emergency situations (Pettit and Beresford

2006), i.e. the type of disaster (van Wassenhove 2006). Furthermore, which knowledge is needed in a relief supply chain also depends on the phase of disaster relief it operates in (Zhang et al. 2002), and whether a regional or or international view is taken (cf. Kovács and Spens 2007).

Relief supply chains adhere to situations in which either the mission itself or time is critical (Zhang et al. 2002). Co-operation in humanitarian logistics requires the sharing of knowledge on the availability of supplies, schedules of aid deliveries and their routing, as well as knowledge about local conditions and culture. Many membership-based international NGOs have local representations that have built up invaluable stocks of local knowledge as they are in contact with local needs and aim and assess these in their day-to-day operations. Other humanitarian organisations deliver aid from the outside and may specialise in particular types of operations. Aid and development workers of NGOs build up invaluable stocks of local knowledge, as they are in contact with local needs in their day-to-day operations. However, this knowledge can be sidetracked and misplaced in the complexity of the communication hierarchy, forgotten over the length of field missions and dispersed due to a high level of personnel turnover associated with many NGOs (de Vasconcelos et al. 2005). Also, treating each emergency and each phase of humanitarian aid as a 'series of discrete activities' (Pettit et al. 2006:329) adds to the barriers of knowledge sharing within humanitarian organisations.

4.2 Facilitating knowledge sharing in communities of practice

Notwithstanding all these hinders to knowledge sharing, there seems to be a clear understanding as to which knowledge needs to be shared across relief supply chains. Tomaszewski et al. (2006) point at points of demand (i.e. where relief supplies need to be delivered), who delivers them to a particular place or group of beneficiaries, when they need to be delivered, and the relevancy of deliveries to disaster-stricken areas. Zhang et al. (2002) call for sharing information about the disaster situation at large, the availability and movement of relief supplies, assessments of population displacements, disease surveillance, relief expertise, as well as meteorological satellite images or maps. King (2005) again discusses the need for knowledge about affected populations and their needs, infrastructure assessments (and questions of accessibility to regions and affected populations), and again the 'who is doing what where' question as core to relief supply chain management. Importantly, logistical data in disaster relief needs geo-

referencing as well as an assessment of its actuality (King 2005). Indeed, disasters affect the infrastructure of a region as well as the distribution of its population, thus the sharing of maps is indeed at the core of knowledge sharing across relief supply chains. Generally, which knowledge needs to be shared can be grouped into (1) contextual knowledge about the region, topography, and current state of infrastructure of an affected area, (2) supply-driven knowledge about the different materials arriving to a disaster region, including not only the quantities but also the sequence of such materials, and (3) needs knowledge about the actual needs of affected populations.

A closer examination of such knowledge needs highlights a separation of between the competitive and the co-operative aspects of relief supply chains. While donor and media relations are the most important issues in terms of competition, they do not relate to neither contextual, supply, nor needs knowledge. One can distinguish between a 'front-office' competition between relief supply chains, while knowledge related to the actual delivery of relief is linked to 'back-office' operations. A strategy for inter-organisational knowledge sharing in back-office operations is the use of 'human action' (Nonaka 1994), or sharing knowledge via interpersonal interaction among a group of practitioners dealing with the same problem (Choi and Lee 2002). This is in line with Fawcett et al.'s (2008) 'people empowerment' as a facilitator of supply chain collaboration.

To facilitate knowledge sharing between organisations, de Vasconcelos et al. (2005) offer the solution of a web-based knowledge-sharing portal, much in line with the so-called virtual communities of practice. Garavan et al. (2007:34) go as far as to discuss communities of practice (CoP) as a potential 'theory of knowledge creation'. 'CoPs differ from networks in that they are about something rather than just a set of relationships' (Garavan et al. 2007:36, emphasis added). Von Krogh et al. (2003) discuss CoPs of software developers in the context of open source software. In such 'emerging' CoPs, questions of membership and entry barriers can become crucial, as the CoPs are rather large. Smaller, intentionally created CoPs are typically launched with a common goal (Garavan et al. 2007). Here, the crucial question is about management. Looking at inter-organisational initiatives in relief supply chains, we found a variety of different communities of practice.

Humanitarian organisations are involved in numerous communities of practice and many platforms for knowledge sharing for relief supply chains. There are even dedicated news sites for emergencies, e.g. ReliefWeb and Reuters' AlertNet.

Interestingly, some communities of practice for humanitarian organisations have a focus on logistics. Inter-organisational knowledge sharing in relief supply chains can occur in the supply chain, with third party logistics providers, and across humanitarian organisations on the international or the local level (see Figure 1).

Figure 1 Communities of practice in relief supply chains

Some of these communities of practice target big international organisations (such as the UN's 'cluster approach' of to facilitate interaction among different agencies and NGOs working in similar areas – many of which affect humanitarian organisations, and one of which is dedicated to logistics; the (again UN-driven) Humanitarian Response Network that involves the use of common global depots to pre-position stock for emergencies; or their operational arm in forms of the United Nations Joint Logistics Centre (UNJLC) that is defined as an 'interagency common service' to support humanitarian organisations with logistics information in large-scale emergencies), others are local communities of practice in the countries of supply (e.g. the UK Overseas Department's Humanitarian Practice Network (HPN) that even launched an 'active learning network for accountability and performance in humanitarian action' (ALNAP), or the Norwegian humanitarian supplier community NOREPS). Also, most international NGOs have internal knowledge sharing platforms – which is the more

important for membership-based organisations with numerous local representations (or ‘chapters’). New types of communities of practice are launched constantly together with universities (e.g. HELP in the UK, HUMLOG in the Nordic countries), but also among only practitioners of humanitarian logistics (e.g. WORLD). All this points to a professionalising of the discipline, including the launch of initiatives of certifications for humanitarian logisticians (developed by CILT together with the Fritz Institute), and new executive masters programmes in humanitarian logistics (e.g. at INSEAD, or USI). Generally, six different types of CoPs can be distinguished in relief supply chains: (1) among suppliers, (2) in the relief supply chain, (3) internationally across humanitarian organisations, (4) with third party logistics providers, (5) locally across humanitarian organisations, and (6) between practitioners and academics. Table 2 compares the first five of these types of CoPs as for which knowledge they share.

Table 2 Comparing communities of practice in humanitarian logistics

Knowledge shared	Contextual knowledge	Supply-driven knowledge	Needs knowledge
<i>Among suppliers</i>		Common product development Knowledge about material standards in the humanitarian arena	Knowledge about the demand from humanitarian organisations (not directly beneficiaries)
<i>In the relief supply chain</i>	Knowledge of nature and reoccurrence of disasters impact on the development of framework contracts	Product focus: product development, quality standards Pipeline focus affecting delivery schedules	Needs assessment affecting product allocation to particular disasters
<i>Internationally across international humanitarian organisations</i>	Sharing alerts of disasters Distribution of current maps, sharing of infrastructure-related logistics information Establishment and location of regional hubs Setting standard procedures	Knowledge of scheduled supplies affecting further orders across organisations Prioritisation of items affecting delivery schedules Bundling of deliveries Development of common standards Division of roles and responsibilities	Sharing of needs assessments against deliveries of all organisations Choice of lead organisation for camp management
<i>With third party logistics providers</i>	Knowledge about current state of infrastructure affecting modal choice and vehicle routing TPLs focus on regions where they have contextual knowledge	Product focus: modal choice based on items to be delivered	Focus on the location of beneficiaries and quantities to be delivered
<i>Locally across humanitarian organisations</i>	Focus on preparedness for particular types of disasters the region is prone to	Knowledge of supplies in the region Focus on training and databases of logisticians 'on call' Division of roles and responsibilities	Beneficiary focus: knowledge about the potential needs of beneficiaries in the region

While a number of CoPs in relief supply chains exist already, not all potential examples of CoPs in Figure 1 could be found. There were CoPs with suppliers (e.g. NOREPS) and many CoPs of large international humanitarian organisations, most of which focused on the planning phase of disaster relief. In this phase, current CoPs are involved in setting quality standards, collaboration procedures, but even provide inter-organisational logistical training. Interestingly, though local CoPs did exist, they concentrated on classical ‘donor’ countries rather than disaster locations. Also, although international humanitarian organisations have databases of logisticians to activate when a disaster strikes (e.g. the database of the Finnish Red Cross encompassing a list of logisticians that work in the industry as their ‘day job’, or NOREPS running a similar database for the Norwegian Red Cross and the Norwegian Church Aid), these are not intentionally created as CoPs and do not share any knowledge. The current sole function of these databases is to increase the flexibility of the human resources of humanitarian organisations – again, interestingly focusing on ‘donor countries’ rather than disaster prone regions.

And though UNJLC serves as an operational arm in large-scale emergencies to foster collaboration at the site of a disaster, intentionally created CoPs could further foster and benefit from the shared knowledge created in teams of humanitarian logisticians coming together from different organisations. Yet there was little evidence to be found about these kinds of local CoPs across humanitarian organisations. As in the case of CoPs with suppliers, local CoPs across humanitarian organisations focused on donor countries – e.g. the common warehouse of the Norwegian Red Cross and Norwegian Church Aid in Norway, or the one of the Finnish Red Cross and Save the Children Finland in Finland. Having said so, international organisations have established regional hubs around the globe (e.g. under the umbrella of the United Nations Humanitarian Response Depot UNHRD, or under the Christian Alliance for Humanitarian Aid, to name but a few). Yet these hubs do not serve the purpose of local (in-country) CoPs.

But even though there are some much publicised partnerships between humanitarian organisations and third party logistics providers (such as the WFP-TNT partnership), no CoPs could be found with third party logistics providers, confirming Pettit et al.’s (2006) criticism of a lack of willingness of humanitarian organisations to learn from commercial partners. Having said so, existing CoPs of humanitarian logisticians can bridge this gap on a more general than a particular partnership level. As an example,

logisticians of WORLD encompassing contacts of logisticians 'on call' in different countries can offer their services to a variety of humanitarian organisations rather than just their preferred partner. This indeed enabled them to establish a common pipeline for several organisations during Cyclone Nargis.

Humanitarian organisations share the goal of serving beneficiaries, but compete for donations and media exposure. However, the actual serving of beneficiaries is left to humanitarian logisticians who typically are not engaged in front-office activities of fund-raising and media communication. Thus, if communities of practice were focused on specific issues (such as logistical problems of a particular emergency), and the members of a CoP created a shared meaning about its goals, competition might not inhibit the sharing of knowledge.

5 CONCLUSIONS AND FURTHER RESEARCH

The concepts of co-operation and collaboration are core factors when supply chains (or networks) compete against other supply chains. However, in order to share knowledge in a supply chain, there is a need for a strategic will to work together, which must be derived from the 'top' and generated by the CEOs. The challenge is then to make it work throughout the bottom echelons (Kidd et al. 2003). Co-operation across humanitarian organisations has repeatedly been called for in order to avoid duplication of efforts and to enhance the performance of disaster relief activities. An important aspect of co-operation is the sharing of knowledge across organisations. Yet aspects of competition – a typical hinder of knowledge sharing – have insofar been neglected when it comes to humanitarian organisations. On the other hand, competition in relief supply chains concentrates on 'front office' activities rather than the (mainly) 'back office' aspect of actually delivering relief items. Therefore communities of practice approaches can be useful to share knowledge in relief supply chains with a focus on logistical problems.

A number of CoPs could indeed be found in the humanitarian arena, some of which actually focus on humanitarian logistics. The main focus of current CoPs is on knowledge sharing across large humanitarian organisations. However, it might be important to establish CoPs for smaller humanitarian actors as well, especially as these – as SMEs in the business arena – often lack logistical expertise, but on the other hand can well specialise in niches larger humanitarian organisations do not focus on (Long and Wood, 1995). Current CoPs also tend to focus on the planning phase of disaster relief. However, humanitarian organisations could benefit from the knowledge of local cross-organisational teams that have worked together on particular emergencies. Their shared repertoire of resources, stories, symbols, terminology and identity might be useful in tackling other emergencies to come. Therefore local disaster-based CoPs could be established to transfer knowledge across disasters. Yet other local CoPs could focus on sharing knowledge about the needs of beneficiaries in certain regions, to help answering Blanco and Rice's (2007) call for needs-driven relief. A further unexplored area is that of CoPs for humanitarian and commercial actors. Even though much of literature on relief supply chains has 'imported' concepts and principles from the business to the humanitarian arena, cross-learning between the two is still scant.

In summary, co-operation is a key issue in order to bring relief to beneficiaries. Co-operation is needed during operations as well as before and after a disaster strikes.

However, a much neglected hinder for the co-operation of relief supply chains is the competition between humanitarian organisations. Albeit sharing the same goal to deliver aid to vulnerable people (the beneficiaries), save lives and alleviate suffering, humanitarian organisations compete for donations, i.e. their financial resources. Therefore, co-operation and competition impact simultaneously on the incentive to share knowledge among actors in and between supply chains. How the forces of cooperation and competition affect the performance of supply chains is an unexplored area for empirical studies. Further studies also need to be conducted on if and how intentionally created CoPs could be introduced in order to increase knowledge sharing in and between supply chains.

Last but not least we would like to highlight some managerial implications of our study: Generally, there is a clear front-office vs. back-office divide between the inhibitors and facilitators of knowledge sharing in relief supply chains. It is therefore not surprising that CoPs have a rather operational focus on e.g. logistical activities. Also, there are a number of co-operative efforts to be especially seen across international humanitarian organisations, ranging from the establishment of common regional hubs and quality standards, to the sharing of maps and the development of common pipelines in responding to disasters. However, if knowledge sharing was to be facilitated, more CoPs would need to be intentionally established, bringing humanitarian logisticians together not only across humanitarian organisations but also including stand-bys and commercial partners. Keeping CoPs to the back-office function of discussing logistical activities would also here enable knowledge sharing, and a better preparation of each organisation involved in disaster relief.

Another dimension in which CoPs would need to be strengthened is the local one. It is primarily local actors (or humanitarian organisations with a steady local presence) that have the knowledge of the potential needs of beneficiaries in the region, including their cultural and religious specificities, locational distribution etc. Such knowledge would facilitate the needs assessment process for any organisation involved in relief supply chains, thereby improving the response to disasters.

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