So where next? Developments in humanitarian logistics

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ABSTRACT

Upon a review of history and many findings from current humanitarian logistics research and practice, this chapter turns to the future of this field. It is an attempt to answer the question of 'so where next?' Much has happened lately that indicates the maturing of humanitarian logistics, humanitarian supply chain management and, indeed, humanitarian supply networks. Coordination patterns have been developed between agencies and the focus is now turning to collaboration in the humanitarian supply chain and even combining inter-agency coordination with supply chain collaboration through purchasing consortia, sharing of logistics service providers and material suppliers etc. Humanitarian organizations have also started to develop services they offer each other. Apart from the obvious purchasing economies, the accumulated demand from several agencies gives rise to dedicated product development. Standards are implemented for technologies, products but also (logistical) processes.

Technology for humanitarian logistics is constantly developing, now facilitating a shared pipeline visibility. With visibility comes also the possibility to not only develop performance metrics for the humanitarian supply chain, but also, to follow them up. New, meaningful metrics need to be developed for effectiveness, efficiency, but also equity. Besides equity considerations, beneficiaries are becoming active members of the humanitarian supply chain – once the challenge of a secure access to beneficiaries is resolved. Community development is on the agenda as are questions of the sustainability of aid. The latter is considered from aspects of embedding disaster relief in long-term development, in terms of greening the humanitarian supply chain, as well as in designing it with an exit strategy in mind.

INTRODUCTION

Humanitarian logistics – both research and practice – has come a long way since the original outcries about the poor management of the 2004 South East Asia tsunami. Back then, criticism of humanitarian logistics practice focused on a lack of coordination of humanitarian efforts, on congested ports and airports, on problems with customs clearance, and on many questionable decisions over which items and services the beneficiaries should be provided with. Research was not in the spotlight, s very few academics had considered the area and there was virtually nothing in the way of investigations of the topic. That logistics should come into focus was triggered by more than a lack of coordination and pipeline problem, rather it was the recognition that it was the main cost driver of humanitarian operations. While van Wassenhove (2006) put the bar high suggesting that 80 per cent of the income of humanitarian organizations is spent on logistics, Blansjaar (2009) offers a slightly lower – but still highly significant figure – of 50–60 per cent. It follows, therefore, that improvements in humanitarian logistics performance should translate into a better outreach of the aid and a better level of service to the beneficiaries. But whereas many of the contributions to this book have taken a historical perspective, this chapter seeks to provide a forward view on some of the emerging challenges in humanitarian logistics. In order to achieve this, it will first revisit some of the recent topics in research and practice before outlining some of the key gaps in the research to date, and the important trends in practice.

From inter-agency coordination to relationship building in the supply chain

As highlighted by the 2004 SE Asia tsunami, inter-organizational coordination (or the lack thereof), became one of the prime foci of humanitarian logistics practice and research. The United Nations humanitarian reform programme highlighted the existing inefficiencies, gaps, duplication and overlap. The clear need for inter-agency coordination led to the establishment of different topical clusters, one of which (subsequently called the Log Cluster) was to focus on logistics (GHP, 2006).

Similar movements aimed at improving the coherence and coordination of the post-disaster preparation and response mushroomed across groups of faith-based organizations, and groups of organizations with similar mandates etc.**1** But also, other

dimensions were embraced under the coordination umbrella: humanitarian–private partnerships (in logistics this being particularly prevalent between humanitarian organizations and both global and local logistics service providers), civil–military coordination in its various guises (see Chapters 12 and 13), as well as supply chain collaboration. In practice, these first efforts were very much focused on inter-agency coordination (only), and this was reflected in the relative abundance of scientific articles devoted to this topic.

Inter-agency coordination

Inter-agency groups and clusters were generally pretty well aware of the issues and challenges implicit in their stove-pipe approach to a disaster, but faced the challenge elegantly described in an old saying that 'everybody wants coordination, but nobody wants to be coordinated'. This led to a questioning of the leadership role of cluster leads, and though meetings were designed to be inclusive, in practice only BINGOs (big international non-governmental organizations) and designated aid agencies participated in global meetings. The sheer number of meetings was also something to be coordinated – Völz (2005) quotes 72 per week in Banda Aceh alone upon the 2004 SE Asia tsunami.

Nevertheless, and notwithstanding all the challenges, the humanitarian reform programme has led to the establishment of a joint global hub system (in parallel with the rise of regional hubs for individual organizations **2**) that includes interagency warehousing. The logistical principles of speculation (or pre-positioning) and postponement (eg blank stock that is appropriately labelled immediately prior to dispatch) were employed simultaneously and this allowed the consideration of the topic as part of the humanitarian logistics research agenda (Listou, 2008). In addition, agreement between agencies to conduct joint pre-positioning or warehousing clearly opens up the possibility for the swapping of material supplies, a topic that is currently in the spotlight also in business logistics (cf Kosansky and Shaefer, 2010) – and, indeed, with the potential for exchange of air cargo, shipping or lorry transport slots. At the same time, 'softer' questions of coordination, such as the development of trust between humanitarian field workers (Tatham and Kovács, 2010), have started to be addressed.

Inevitably, roles and responsibilities became somewhat clearer over time. As a result, in the aftermath of Cyclone Nargis (August 2008), the Log Cluster operated

alongside the UNJLC**3** and UNHAS**4** (including secondees from 10 humanitarian organizations as well as three commercial logistics service providers) in a Global Logistics Cell that provided services used by 39 humanitarian organizations (Logistics Cluster, 2009). Furthermore, the Log Cluster used their experiences in responding to this disaster as the basis for the agenda in their subsequent 'lessons learned' global meeting of October 2008 in Brindisi. This recognized the importance of harmonizing the plethora of pre-existing templates used for ordering and tracking items as well as a GIS-T system for assessing transport infrastructure while delivering aid. Templates and technology were key to the opening sharing of online information (albeit it was accepted that this might need to be somewhat restricted in complex emergencies). In parallel, recognizing customs procedures as a potentially significant and life-threatening source of delay, a project was initiated to harmonize customs procedures for disaster relief.

Turning the clock forward to 2010, the development of standards and templates **5** continues to be key for humanitarian operations, and this has led the Log Cluster to develop and publish a Logistics Operational Guide (the 'LOG' **6**). That said, meetings are but one way to coordinate logistical efforts and it is clear that issues such as duplications of effort, prioritization of scheduled arrivals and distribution could be resolved more effectively through an improvement of pipeline visibility across humanitarian organizations. With the development of humanitarian logistics software (such as HLS for the IFRC or HELIOS, as its light version, for broader use **7**), the door is open to the standardization of the underpinning processes of disaster relief operations and, thus, to the improvement of pipeline visibility not just within but also across different humanitarian organizations. But although process standardization and pipeline visibility are appearing on the agenda of at least the larger humanitarian organizations, (see Chapter 3), research on these topics is unquestionably lagging behind. Furthermore, associated issues such as product and packaging standardization, modularization that would facilitate joint/shared transportation, have yet to be addressed in humanitarian practice and research.

New dimensions to coordinate

With the increasing recognition of the need for inter-agency coordination and the tentative steps towards its improved achievement, comes a move to consider other dimensions of coordination. This builds on the many partnerships between humanitarian organizations and global logistics service providers (LSPs) that have

been established and researched in the past years **8**. However, the focus is moving on to cross-learning from these partnerships and also to their local rather than global dimension. The importance of strengthening local economies – as previously discussed in global vs local sourcing in humanitarian supply chains (Jahre and Spens, 2007) and a recent 'hot topic' in humanitarian logistics research (Kovács and Spens, 2008) – has also been embraced in relationships with LSPs. Thus Mattila (2008) found that humanitarian organizations have started to move away from global partnerships to a policy of establishing such arrangements with regional or local LSPs. In reality, it is argued that global partnerships are complementary to local ones, and are established in parallel to deal with inbound vs outbound logistics activities.

A further dimension of coordination is constantly gaining in importance. Humanitarian logistics has moved on towards humanitarian supply chain management, which demands that organizations take a more strategic dimension and associated view of suppliers and customers. As discussed in the first chapter of this book, such a development follows the history of logistics and supply chain management in general with a first extension towards suppliers and then a rediscovery of the role of beneficiaries in the humanitarian supply chain.

As a result of this process, new questions have emerged. First, should a (material) donor be seen as a supplier or a customer that needs to be satisfied (or both)? Historically, funding schemes and fundraising activities have been the focus of considerable attention within humanitarian organizations, and while their concerns for accountability and transparency are laudable, the extent of activities related to seeking funding and reporting to funding institutions inevitably shifts their attention away from beneficiaries. Furthermore, (and as discussed in Chapter 2), the design of funding schemes has a clear impact on the design of humanitarian operations and the humanitarian supply chain. New, basket funding schemes have the potential to address many of these issues by providing supplementary funding to a problem area (a region, disaster or activity) and thereby enabling the logistical principles of postponement and speculation to be embraced. However, much remains to be achieved in terms of developing an organization's understanding of the optimal mode of operation for the humanitarian supply chain and, in particular, for consideration of supply chain performance in terms not only of effectiveness and efficiency but also equity (see Chapter 4). In this respect, after lengthy discussion of (external) aid effectiveness vs (internal) performance measures in the humanitarian supply chain,

research has recently embraced the equity dimension from public services to this context (Balcik et al, 2010).

Second, are beneficiaries to be seen as 'customers' even though they lack traditional purchasing power (Kovács and Spens, 2008)? There are (hopefully) no repeat purchases, and beneficiaries can rarely choose between items and services and rarely select a particular supplier. Beneficiary preference has, therefore, sometimes been treated as irrelevant (cf Beamon and Kotleba, 2006)! That said, new developments of practice such as cash components in aid are bringing back the purchasing power and customer role of beneficiaries. This also fits well with research rediscovering the customer service dimension of the supply chain management framework for humanitarian supply chains (Oloruntoba and Gray, 2009). What is more, beneficiaries can be, and have been, incorporated as active members of the humanitarian supply chain in, for example, reconstruction supply chains (Kovács et al, 2010).

Last but not least, how does the humanitarian context impact on commercial suppliers and vice versa? Much of the context is similar to fields such as public health care, education and public services in general, thus research and practice in these fields can also be beneficial to humanitarian supply chains (and again, vice versa). A crucial difference between public services and humanitarian supply chains is, however, the need to develop relationships with suppliers just in case. In other words, supplier relationships in the humanitarian context are rarely built on the basis of a frequent economic transaction but are dormant (or latent) relationships. As in the case of inventory pre-positioning, future demands are uncertain, and suppliers are needed with a capacity at the time of need (Whybark, 2007). This implies that suppliers are expected to set aside other orders when needed, and can even be expected to delimit their own partner organizations and companies to those that comply with humanitarian principles. However, notwithstanding these constraints, many companies have welcomed humanitarian organizations as their customers for a variety of reasons. Even though much of this activity takes place under the umbrella of corporate responsibility (Kovács, 2008), the reality is that the humanitarian 'industry' is booming (Thomas and Fritz, 2006). Companies ranging from the pharmaceutical industry to packaging manufacturers have even started to develop tailor-made products for humanitarian purposes. An example of this is Clip-Lok's containers that are convertible to latrines. But after much discussion in which the motives of companies vs humanitarian

organizations to enter partnerships was scrutinized, the debate has turned towards aspects of relationship building in the humanitarian supply chain (Larson, 2010).

Inter-agency coordination can also be mixed with supply chain relationships. Pipeline visibility and joint stock aside, inter-agency purchasing consortia (such as the UK-based Inter-Agency Procurement Group) have helped to achieve purchasing economies at the same time as avoiding the double-booking of manufacturing capacities. In addition, purchasing consortia enable the swapping of supplier capacities depending on the particular short-term financial situation of different humanitarian organizations. Aggregating volumes over several organizations also aids the creation of a positive atmosphere for further product development for humanitarian purposes. Indeed, joint supplier platforms (such as Innovasjon Norge) can work as incubators for this kind of product development. In summary, the focus on coordination has shifted from inter-agency coordination to relationship building in the humanitarian supply chain, and further to a mix of the two.**9**

Technology development and the pragmatism of humanitarian operations research (OR)

Technology development has also entered a new era as more and more humanitarian organizations are not just developing logistics information systems – eg IFRC's fleet management system and World Vision International's tracking system – but are also opening them up for use/lease by other humanitarian organizations. The novelty does not necessarily lie in the development of such technologies but, rather, in the services humanitarian organizations have started to offer each other. However, service management research has yet to discover the area of humanitarian logistics and supply chain management.

New technology development projects embrace questions of interoperability across organizations, systems and, indeed, people. For example, RFID for humanitarian logistics need not only deal with questions of technological feasibility, system interoperability, propriety and user rights but also, interoperability across different types of humanitarian organizations (eg the health and shelter clusters), including organizations that operate in different phases of disaster relief (from search and rescue operations to long-term development). Social media applications and the like have also entered the scene through applications including searching for missing relatives to matching donations with demand (eg ALAN's AidMatrix **10**).

With technology comes improved data – not only historical but, increasingly, with minimal time lag. This, in turn, gives rise to the potential use of dynamic operations management models in humanitarian logistics. This new trend in research embraces the slogans of 'doing good with good OR' as well as 'compassionate operations'. What has not been possible before due to a lack of input data (and many authors have previously been criticized for modelling away reality by assuming the existence of demand data, or worse, assuming constant demand) may, indeed, be possible in the future. Yet it continues to be of huge importance that operations management and operations research scholars appreciate the constraints of the actual operational theatre of humanitarian logistics. As van Wassenhove (2010) emphasized in his tutorial on humanitarian logistics at the ALIO/INFORMS conference in 2010, 'good' OR for humanitarian logistics is pragmatic and, hence, focuses on context-driven, simple and applicable solutions. In other words, the humanitarian OM/OR models of the near future should focus on decision support rather than finding optimal or near-optimal solutions. The challenge of humanitarian OM/ OR research therefore lies in working with contextual constraints and consciously building these into proposed models.

Questioning disaster taxonomies and the humanitarian-development divide

Take any article in humanitarian logistics prior to 2009 and it will start with a long discussion of types of disaster, phases of disaster relief and the various taxonomies combining the two. Notwithstanding the additional challenges that a complex emergency' brings (such as questions of security, the use of armed forces, access to the other group(s) of beneficiaries) when compared with a natural disaster (Listou, 2008), taxonomies can be misleading and their use for logistical purposes has been questioned. Kovács and Spens (2009) tried to categorize the typical disasters in Ghana according to a natural vs man-made and slow-onset vs rapid-onset divide, but came to the conclusion that a number of 'natural' disasters can have their root causes in human activity, such as bush fires leading to deforestation, depletion of fertile soils and, ultimately, food shortages, famine as well as internally displaced persons (IDPs) – indeed, some would argue that there is no such thing as a natural disaster, rather it is the decision of humans to, for example, live in a particular earthquake zone (Haiti) or deltaic region (Bangladesh) that places them at risk. Similarly, climate-change related disasters – although on the rise (Suarez, 2009) – equally defy such

categorizations. Thus, rather than looking at the phases of disaster relief per se, Tatham and Kovács (2007) saw shifts in major transportation modes as defining moments. Other than that, general timelines are important in order to determine who is involved at which point in time in disaster relief activities (Beresford and Pettit, 2010) or to pinpoint which activities an organization or a study considers.

Units of analysis – taking the strategic view

As for different types of supply chains, McLachlin et al (2009) differentiate between for-profit and not-for-profit and interrupted vs not interrupted environments, placing disaster relief in the not-for-profit but interrupted quadrant. Although this categorization is interesting from a supply chain management perspective, it needs to be borne in mind that interruptions are seen as such from a local perspective (a particular disaster in a region), while global humanitarian organizations can take an aggregate view on demand for their services. The much discussed surge in demand thus only takes place in certain locations at a particular point in time, while global aggregate demand is much smoother. This brings the advantage to BINGOs who do not just operate globally, but also on a scale that enables long-term relationships in the supply chain, fosters product development for humanitarian purposes and allows for purchasing economies – especially if combined with inter-agency purchasing consortia. That said, operations in the field are often carried out by so-called 'implementing partners' of BINGOs, which has largely been neglected in supply chain design research so far. This view again calls for more attention to the strategic aspects of global humanitarian supply chain management – or, as the title of the book suggests, global humanitarian supply network management – and away from the fragmented treatment of each disaster as a unique case. After all, disasters are not just events in the highly uncertain risk category of supply chain risk management but the very raison d'être for humanitarian organizations (Kovács and Tatham, 2009). Besides learning from specific cases, humanitarian logistics research could therefore benefit from more comparative cases (such as longitudinal studies, as in Gatignon et al, 2010) and those that take a more strategic view. Initial examples that are moving in this direction have begun to emerge, including a review of critical success factors (Pettit and Beresford, 2009) as well as the cost drivers of humanitarian logistics (Tatham et al, 2010a).

Taking such a strategic view readdresses questions of urgency and speed that have long been advocated as the ultimate performance indicators in humanitarian logistics

(to the extent that Beamon, 1999, has put lead times at an ideal of zero). A focus on lead times and responsiveness has earned humanitarian supply chains the label of being 'most agile' (cf Oloruntoba and Gray, 2006) or 'fully flexible' (Gattorna, 2009). Although responsiveness and resilience will always remain important concepts in the humanitarian context, an aggregate view extends the previous short-term focus on immediate response to a disaster to planning and preparedness on the global scale. The urgency tag on humanitarian operations can, however, be counterproductive as, for example, humanitarian aid delivered by sea is often not considered urgent enough to be exempt from customs delays – regardless of whether such sea transportation may actually be quicker, cheaper and more accessible than air transportation. This, in part, led to the dismissal of the sea-basing concept in the Ring of Fire even though it would have been more time-, as well as cost-, efficient. Indeed, customs processes all over the globe would need to readdress questions of urgency and lead times from a logistical point of view.**11**

Addressing sustainability

The focus on particular phases of disaster relief is naturally fostered by organizational mandates and the policy-makers generally divide between humanitarian (or emergency) relief and development. Mandates can, indeed, differentiate between relief and development (in food relief between the domains of WFP and FAO), but humanitarian organizations have started to attempt to bridge the gap between short-term relief activities and long-term development (again in food aid, the International Alliance Against Hunger brings together WFP, FAO and IFAD for just this reason **12**). Moreover, humanitarian organizations have long taken on tasks that relate to (regional economic) development, and considerations of the sustainability of aid (humanitarian or development aid) have led to a blurring of this divide. Besides, disasters often take place in developing countries **13** where humanitarian and development activities overlap. For example, the 2008 cholera outbreak in Zimbabwe came at a time when international humanitarian and development agencies were already present in the country to support the national public health care system. Thus, humanitarian and development activities need to be considered jointly, and disaster relief needs to be embedded in long-term development. Research has yet to attend to the gaps in between, and the practicalities of considering the long-term effects of humanitarian activities. Most importantly, humanitarian supply chain design needs to

address questions of sustainability from the very moment of the activating humanitarian efforts.

Sustainability has multiple meanings in the humanitarian context. It can be applied in relation to sustaining an operation, ie maintaining aid through continuous funding (financial continuity) and/or embedding it within development activities (long-term development). It can also be understood as designing the humanitarian supply chain in a way that facilitates its continuation in the region after humanitarian organizations have left (sustainable exit strategy). Supply chain design can also consider sustainability from the perspective of community development through local sourcing, capacity building and engagement of beneficiaries. Thus, Kovács et al (2010) present a case of community-based supply chain design where beneficiaries become active members of the reconstruction supply chain. This approach contributes to beneficiary empowerment, helping to ensure community ownership of the reconstruction process, as well as to the local economy in general. Additionally, community-based supply chain design can incorporate aspects of peacebuilding (Anderson, 1999). But humanitarian supply chains have yet to embrace the challenges of becoming 'green'.

That said, green humanitarian logistics projects have begun to focus on issues such as transportation emissions although, arguably, there is little choice in the mode of 'last mile' transport and the emissions it causes – albeit, in an ideal world, maintenance regimes for vehicle fleets would improve along with the associated reduction in harmful emissions. In addition, however, there are enormous opportunities for reducing the environmental impacts in other areas of the supply chain. Inbound transportation accounts for much of logistics costs (up to 60 per cent in some cases) as items are moved around the globe. Not all these items need to be shipped in this way, and local sourcing is not just a matter of strengthening local economies but it also helps in cutting transport costs as well as emissions. But other activities in the field (from warehousing to camp management) also have serious environmental impacts. Non-degradable materials in the field have further environmental implications, particularly as there is an almost total absence of reverse logistics processes. Furthermore, some organizations may still bring unsolicited items to the field, **14** although increasingly organizations have started to manage in-kind donations, soliciting them as they are actually needed – a prime example being the American Red Cross who will actively contact manufacturers and seek specific donations (towels, nappies, tents etc). Nonetheless, all items given to beneficiaries

remain in the field, and even large units such as field hospitals are commonly donated to the host country of the disaster relief operation. Most importantly, however, greening the humanitarian supply chain requires aid organizations to look beyond field activities to the supply chain to choices of suppliers, materials, manufacturing processes as well as transportation links (Sarkis et al, 2010). Indeed, given that many natural disasters can be associated with climate change (eg the 2010 flooding in Pakistan) and the whole subject of climate change adaptation and related early warning systems have been high on the agenda of humanitarian organizations for many years, surprisingly little attention has been paid to greening the relief supply chain itself.

Besides climate change, urbanization also impacts on humanitarian supply chains. Already by 2009, it has been estimated that 50.5 per cent of the world's population lived in cities, and this percentage is expected to rise (UN DESA, 2010). Urbanization increases the vulnerability of populations in and to disasters as more people are exposed simultaneously and, as urban dwellers, have relatively few mitigation and coping strategies (Suarez, 2009). Even if the number of disasters were to decrease (though trends point to the opposite), urbanization boosts their impact. From a sustainability perspective, early warning systems, enforcement of more stringent and robust building standards along with a reinforced focus on preparedness in the humanitarian supply chain are emphasized once again. Indeed, in this regard it is instructive to compare the impact of the earthquakes in Haiti (January 2010) and Chile (February 2010). Although the latter was some 300 times more powerful, the death toll was less than 1,000 (with around one-third of this mortality actually being caused by a post-earthquake tsunami), compared with the 230,000 killed in Haiti. And although both quakes struck urban areas, Chile has a stricter regime of building codes that are relatively rigorously enforced (Bilham, 2010).

Concluding remarks

New trends also bring new challenges in humanitarian logistics. Firstly, the whole field of humanitarian logistics has broadened from a narrow focus on operations in particular disasters to strategic considerations of how best to operate a (sustainable) humanitarian supply chain. Calls for more coordination have been (partly) answered across agencies, and these are now being extended to the humanitarian supply chain itself, not least as a means of improving visibility across supply chains. More and more key logistics principles from postponement and speculation to standardization

and modularization as well as the adaptation and development of products and services for humanitarian purposes are to be found in the best-of-breed humanitarian supply chains. In other words, the discipline is maturing, which is also visible in first academic attempts of dedicated theory development (see Jahre et al, 2009). Clusters, communities of practice, platforms and associations (most notably the Humanitarian Logistics Association) have developed to foster the professionalization of the field and have resulted in the development of specialized training programmes, certificates and education programmes. This has, in turn, shone a spotlight on the skills and attributes required by successful humanitarian logisticians (Tatham et al, 2010b). In short, humanitarian logistics research has become more institutionalized with institutional partnerships and with new outlets of research results. Apart from many recent special issues in logistics and supply chain management journals, a new, dedicated outlet has also been launched: the Journal of Humanitarian Logistics and Supply Chain Management. Ideally, it will serve as a scientific journal that can contribute with theoretical developments but also with a pragmatic approach to the improvement of humanitarian logistics practice.

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Notes

1) Not surprisingly, coordination became one of four (or five) initial topics to be addressed by the HUMLOG Group as decided in their Geneva meeting in 2007. The other topics were funding (see also chapter 2), needs assessment (chapter 3) and performance measurement (chapter 4), as well as, arguably, organizational learning.

2) A similar hub system and, thus, decentralized supply chain design has been established by the International Federation of Red Cross and Red Crescent Societies (IFRC) since 2006 (see Gatignon et al, 2010). Interestingly, these regional hubs (both those of the UN and the IFRC) overlap with the geographical locations of similar systems used by commercial logistics service providers.

3) United Nations Joint Logistics Centre.

4) United Nations Humanitarian Air Service.

5) Templates have also been developed for needs assessment, eg HELP and CILT's 'HELPNAT' template.

6) Available at: http://log.logcluster.org/ [accessed 29 July 2010].

7) The Humanitarian Logistics Software (HLS) of the Fritz Institute has been adopted by the International Federation of Red Cross and Red Crescent Societies (IFRC) and continues to be developed and implemented as the Helios software across organizations such as Oxfam, World Vision International etc.

8) A series of INSEAD teaching cases addresses partnerships between LSPs and humanitarian organizations – see also Tomasini and van Wassenhove (2009).

9) The mix of inter-agency coordination with supply chain collaboration (re-) introduces and re-emphasises a network view of humanitarian supply chains. A taxonomy of projects, chains and networks in humanitarian logistics can be found in Jahre et al (2009).

10) See: http://www.aidmatrix.org/alan/index.html [accessed 29 July 2010].

11) Customs and modal shift are areas in which logistics performance indicators are still subordinate to political constraints in humanitarian logistics.

12) The three organizations are the World Food Programme (WFP), the Food and Agriculture Organization (FAO) and the International Fund for Agricultural Development (IFAD). These are the so-called 'Rome-based agencies', though several other NGOs have joined the alliance since. More information can be found at: http://www.iaahp.net/ [accessed 29 July 2010].

13) Linnerooth-Bayer et al (2005) present statistics on the discrepancies between death tolls of natural disasters based on country income, but the differences are even higher if one would consider complex emergencies and internal conflicts as well. Unfortunately, not even EM-DAT compiles data on such disasters despite that natural disasters account for about 6 per cent of humanitarian activities (according to van Wassenhove, 2006).

14) Until recently, it had appeared that this trend was decreasing – perhaps as a result of publicity explaining the downside of such donations. However, it is clear from reports in the wake of the January 2010 earthquake in Haiti that it still remains a difficult area. In any event, there are no reliable statistics on the matter.