ESSAY: Humanitarian logistics

According to Thomas and Kopczak (2005), humanitarian logistics can be defined as the process of managing the planning, acquisition, transportation and warehousing of goods and materials from the point of origin to the point of consumption, to help deliver relief to those affected by disasters in a cost-effective way. Similar to commercial logistics, the goal here is however to reduce human suffering, while commercial logistics aim at minimizing costs.

Humanitarian logistics is usually described as having four phases. First comes the mitigation phase. It consists in pre-planning for disaster relief by realizing a risk analysis of potential threats and then trying to prepare to dampen disaster relief. For example, setting up warehouses to hold relief supplies or implementing warning systems. Then comes the preparedness phase, that is mostly about action planning and protocols: the goal is to actively discuss action steps and taking preventive actions in order to be efficient if a disaster were to happen. After a disaster strikes, we enter the response phase during which the protocols that were previously developed are used to move resources to where it is needed. Finally, the last phase is the recovery phase. It involves cleaning up the debris, rebuilding, and long-term planning to restore decent living conditions.

Research has revealed that the role of logistics is key to the success of humanitarian projects. In their article (2016), Bealt, Barrera and Afshin Mansouri explained that usually up to 80% of the total investment in disaster relief activities involves logistics activities and that more than 40% of this amount is wasted because the efforts are duplicated, thus lacking efficiency.

In this essay, we will analyse the problems met by humanitarian logistics and the solutions that research recommends, with their limits.

Often, donations arrive from multiple sources and are managed by several groups. For example, the International Committee of the Red Cross estimates that major disasters can now attract an average of 1000 different organisations. A key issue in humanitarian logistics is thus managing to efficiently collaborate with all the various organization involved.

An example of needed collaboration can be found with transportation. Providing supplies to people in need implies moving them from the warehouses they are stocked in to disaster areas. Studies have shown that intermodal transportation, namely using at least two different modes of transports during a single journey, is lacking in practice, even though it is used in disaster relief, as it adds complexity to the supply chain. Nevertheless, for Zhang (2011), intermodalism is very useful because each mode in an intermodal transportation process brings its own advantages. For example, railway can be used for long-distance land transportation because it is relatively low cost, while air is especially useful when roads are not available. On the other hand, not considering enough intermodalism in practice will lead to ignoring the potential intermodal problems that may arise, such as cost and delivery delay induced by mode change. In the rush of the response phase, not considering, or at least not considering enough how to incorporate intermodal transportation, leads to decision makers overlooking the advantages of integrating different modes.

However, it is easy to think that locations that require aid are located in remote regions and that existing infrastructure does not allow us to efficiently access them. Yes, planning must be done, but in collaboration with local populations: they are the first concerned and are knowledgeable and resourceful about what they need and how to deliver it to them. If Coca Cola manages to make its way to remote villages, humanitarian logistic chains should as well.

The problem root in any case resides in the planning of humanitarian chains during the two first phases migration and preparedness. Zhang observes that generally, intermodalism is clearly lacking in the transportation of supplies in disaster relief situations. He reports that the current findings show that organizations may not use optimal networks. It actually reveals a critical gap in the education and training practices for disaster relief workers: about 300 logisticians surveyed at major aid organizations indicated that they usually educate and train themselves on the job. Because there is a lack of experienced logisticians, humanitarian organizations are hindered from implemented effective logistics support. Knowing how to optimally coordinate the logistics activities of the humanitarian supply chain is necessary to become more efficient and effective than in the past.

Hence, collaboration, a key concept for humanitarian projects to succeed, as shown through the example of intermodalism, must be planned beforehand, and relies on communication between the different stakeholders. However, it can't be effectively done without experienced logisticians.

If what is needed is education and training, then why not used commercial supply chains as models? Several studies from Ozdamar, Balcik or other researchers identified similarities between both chains, such as speed being a vital factor, believing that what affects commercial supply chains might as well impacts humanitarian chains. By doing so, they developed among other things an optimized schedule for pickup and delivery of relief vehicles as well as proposing optimized quantities to transport, or a maximal coverage model to determine the number and locations of distribution centers, considering inventory capacity limits and budgetary constraints. However, even though some of the tools developed for commercial supply chains can be used by humanitarian logistics, we must also take into consideration their differences. Indeed, first, in humanitarian logistics speed and cost are key drivers, not profitability and market share as it is for commercial supply chains. Then, relief chains answer demands of supplies and people, while, on the other hand, the business field rather focuses on products and services. For relief chains, lead times are equal to zero, where the demand comes from is uncertain and supply prices can go up after a disaster happens: in other words, how to fulfill orders deeply varies from relief chains to commercial ones. Furthermore, humanitarian supply chains do not compete for consumer demand as demand undoubtedly exceeds supply and victims can not simply go look for alternatives. For these various reasons, results obtained in commercial logistics can not be blindly applied to humanitarian ones.

Nevertheless, a crucial difference we have yet to mention which is also a recurring problem in humanitarian logistics is the knowledge of whether aid is actually delivered to its intended receipts, or if it is lost or wasted in the process. Bhimani and Song explained in their article published in 2016 that eventually any organization focuses on delivering supplies to the victims, overlooking the state in which they are sent or if they make it to the destination. For Monaghan and Lycett (2013), this problem is even bigger and concerns many aspects needing quantitative results to be assessed. According to

them, it is due to the nature of humanitarian logistics: in the urgency of the situation, neither the real needs of the victims nor the actual impact of providing humanitarian aid is truly assessed. The raising of funds and the supply of aid is usually based on estimates and various constraints. As a result, humanitarian chains are similar to open loop systems: they can supply unwanted or useless goods to the victims without direct impact on the cash coming into their system as the victims have no available way to confirm their needs are being fulfilled. On the other hand, as Monaghan and Lycett explain, the success of commercial supply chains can be assessed by their impact on the bottom line. Therefore, performance goals can be financial and operational rather than impact related. Because of this clear connection between expected demand and actual demand, commercial supply chains can be considered closed loops: if the quantity, type or quality of products do not meet the needs of the aimed customers, the revenue drops and the bottom line suffers. Reality thus directly interferes with planning and execution, and allows them to be adequately calibrated. This difference is why it is such a challenge to adapt commercial logistic methods to the context of relief logistics.

Yet, donors are increasingly expecting to be aware of both performance and impact and are not tolerant of duplication of effort and wasted resources. Accountability and transparency to ensure traceability of donor funds is more and more required nowadays and therefore organisations, such as the Active Learning Network for Accountability and Performance in Humanitarian Action (ALNAP), have been created to facilitate this. However, Monaghan and Lycett explain that some believes that NGOs create illusions of transparency through increased paperwork to make sure their donors keep supporting them, thus lacking efficiency and missing the initial goal. The heated competition upstream of humanitarian chains, where organizations fight for funds, renders transparency difficult as well. To their credit, impact is difficult to assess because humanitarian supply chains deploy rapidly and are designed to last only for the duration of the emergency. Yet, impact can emerge over time and can be influenced by other factors such as development programs or polices. In addition, what at first seemed helpful in regard to the emergency can have no obvious impact on the global situation. Monaghan and Lycett report that sending food to victims of famine seems to be reasonable but, for example, even though such action had been taken in Dafur (1990-1992), in Sudan, it is unclear whether it saved any lives, because it was in fact a health crisis.

A recurring issue seems to deal with data: enough data to predict which transport to use, enough data to analyze the impact of humanitarian actions… Even predicting disasters is a challenge requiring data. Indeed, simply using physics principles can only go as far as predicting events individually. When we try to link two different kinds of events together, it becomes really difficult as they sometimes involve different theories or their occurrences are quite separated in space and time. In this context, the emerging field of Big Data shows great potential.

Two phenomena explain the increasing access to data we now have. First, we now have access to multiple sources of data. For example, we have online data (social media, web content), data from objects (satellites, CCTV, machine logs) or actively supplied data (citizen reporting or crowdsourcing), and even data previously kept hidden by governments for security motives – even though most information about man-made disasters are still kept confidential. Then, the growth of connectivity and the increased priority placed on maintaining that connectivity even after a disaster occurred allow us to have access to real time streams of data across humanitarian supply. Therefore, we now have access

to lots of data. But 80% are unstructured. Yet, we need to have a way to extract the key features from it to be able to exploit it. Indeed, to be accomplished, each task in humanitarian logistics requires many and different types of information from various sources related to the disaster, such as victims or humanitarian workers, and during an emergency, people are generally under stress. They must make quick and effective decisions in a short time. This is wat they need to receive information in an intuitive and understandable way.

Big data can therefore assist logisticians and humanitarian workers in preventing the waste of resources and the loss or degradation of capacities that can provide essential services during a disaster, and help them to look into disaster management or how people respond to disasters in order to take appropriate measures and implement policies to bring relief for the victims.

To conclude, humanitarian logistics are essential for the functioning of humanitarian organisations and therefore encompass the majority of their budget. Nevertheless, several problems can be identified: lack of coordination between the myriad of humanitarian actors, lack of education and training, and lack of analysed data. To answer these, researchers advise to develop intermodalim, for example, in the case of transportation, to learn from commercial logistics, or integrate data analysts to facilitate the process of making decisions during an emergency. Yet, it must be qualified: notable differences exist between commercial and humanitarian logistics, preventing the latter from blindly copying the methods of the former; collaboration between so many humanitarian groups at drastically different scales will forever be a challenge; and Big Data is still a subject of research, slowly being applied in practice in humanitarian logistics. In other words, a gap exists between research and practice: knowing what will truly be efficient is yet to be known.

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