Chapter 39
Humanitarian Aid Logistics: The Wenchuan and Haiti Earthquakes Compared

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ABSTRACT

This chapter contrasts the response to the Wenchuan earthquake (May 2008) which took place in a landlocked region of China with that of the January 2010 earthquake in Haiti, which as an island nation, was theoretically easily accessible to external aid provision via air or sea. In the initial period following the Wenchuan earthquake, the response was wholly internal as a detailed needs assessment was carried out. Once the Chinese authorities had established the scale of response required, international assistance was quickly allowed into the country. Several multimodal solutions were devised to minimize the risk of supply breakdown. Haiti required substantial external aid and logistics support, but severe organizational and infrastructural weaknesses rendered the supply chain extremely vulnerable locally. This translated to a mismatch between the volume of aid supplied and logistics capability, highlighting the importance of "last-mile" distribution management. The two earthquakes posed extreme challenges to the logistics operations, though both required a mix of military and non-military input into the logistics response. Nonetheless, in each case the non-standard logistics solutions which were devised broadly met the requirements for effective aid distribution in extreme environments.

INTRODUCTION

Accessing Disaster Areas

Recent natural disasters have emphasized the importance of emergency relief response logistics. One of the most serious problems affecting the modern world is the vulnerability of nations or regions in relation to natural disasters such as earthquakes, floods, drought or man-made crises: civil unrest, war, political/tribal disturbance (Pettit and Beresford, 2005). Even though modern technology is often used to predict natural disasters, they are still, often, unpredictable. The most unpredictable disasters are natural disasters and they may occur with little or no warning (Wijkman

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and Timberlake, 1998). For this reason, they cause major damage because of their unexpected impact and the fact that the population is not prepared for them. This results in those in charge of the relief operation primarily focusing on response rather than preparedness, so the system becomes reactive rather than proactive.

There are various difficulties that can occur during a humanitarian aid operation. One of these is to access disasters which occur in landlocked countries, or landlocked regions of maritime countries, making the logistics of the response operation even more complex as, in the first case, it requires a neighboring state to be involved for transit (Pettit and Beresford, 2005). In the case of disasters in landlocked regions, distance, inaccessibility and difficult terrain form the main challenges (Jennings *et al.*, 2002). A different set of problems arise when a country, faced with the consequences of a natural disaster, is unable either through lack of internal capability, or because the disaster has rendered the authorities unable to respond in any meaningful way, unable to provide the necessary response. In such circumstances reliance on third-party countries becomes a necessity. In the recent past there have been several major earthquakes and two are notable because of the problems outlined above.

Disaster Response

In the early stages of an emergency, it is widely acknowledged that the best method in terms of speed and security for distributing food aid is air transport (McClintock, 1997; Jennings *et al.* 2002; Brazier, 2009). The most economic use of air transport for food emergencies is the air drop technique. This technique avoids the need for landing strips, which are often not available or are poorly maintained; or if they are available, they are short, thus restricting the size of aircraft that can carry the aid. The food aid is packed in specially designed parcels that can withstand the shock of being dropped out of the back of a low-flying aircraft (Long and Wood 1995, Jennings *et al.* 2002).

Road transport is flexible, versatile, and relatively inexpensive over short distances and the required infrastructure is usually available in most countries, so roads can normally provide a door-to-door service; roads can also transport almost anything anywhere and at any time (Fawcett *et al.*, 1992). Road transport has the additional advantage that there are often local operators, and it is relatively simple for an aid agency to mobilize and organize a fleet of trucks and to deploy them when and where the need arises (McClintock, 1997). Road transport, however, does have disadvantages as trucks are susceptible to poor weather conditions and the available infrastructure may not be of a suitable quality (Long and Wood 1995, Jennings *et al.* 2002). In floods and earthquakes, however, roads can be vulnerable to surface destruction or bridge/tunnel collapse.

Rail can carry large amounts of cargo cheaply over long distances but it is dependent on a network which very rarely offers a door-to-door service; this means that road transport is needed first and last whenever rail is utilized (Jennings *et al.*, 2002). The major disadvantages of rail transport are its fundamental inflexibility, its lack of gearing to commercial needs and, in the case of many countries, the basic lack of railway infrastructure. It can also be susceptible to flooding and landslides. Waterways are, if deep and wide enough, able to carry large volumes of emergency freight, but their orientation rarely leads directly to the crisis hit region. They are also often segmented by sections of rapids or cataracts; as a consequence, waterways are normally used as part of multimodal solutions rather than as the main method of carriage within either commercial or emergency logistics chains.

Barbarosoglu *et al.* (2002) focused on scheduling in a disaster relief operation whereby tactical decisions are made at the top level, and the operational decisions are made on the ground. Barbarosoglu and Arda (2004) subsequently developed a scenario-based, two-stage model