Characterization of the Supply Chains in After Katrina: Issues / Lessons from an Integrated Social Science-Engineering Perspective

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Motivation

- Delivering critical supplies (e.g., food, water) to a disaster site often becomes a difficult task:
  - severe damages to the physical/virtual infrastructures
  - very limited or non-existent transport capacity
- The situation is aggravated by the lack of:
  - knowledge about how formal and informal (emergent) supply chains operate and interact with each other
  - methods to properly analyze and coordinate flows of priority and non-priority goods
  - scientific methods to analyze logistic systems under extreme conditions
Emergency Logistics / Material Convergence

- Fritz and Mathewson (1956): provided comprehensive treatment, taxonomy of convergence
  - personnel convergence, i.e., movements of individuals;
  - informational convergence, i.e., “movement or transmission of symbols, imageries, and messages…”;
  - materiel convergence, i.e., “…the actual movement of supplies and equipment…”

- Emergency Logistics intertwined with convergence

- Not much research in either field
Key Preliminary Findings

- It is incorrect to think of the logistical operations to a disaster site as a unified supply chain.
- It is a dynamic multi-layered response in which dozens of supply chains overlap, complement, and compete for scarce resources.
- Improving the efficiency of the collective response to a disaster requires incorporation of social science’s state of the art thinking into state of the art supply chain modeling.
Findings: SC plagued by many barriers:

- Technical: the computer system used by the State of Louisiana did not interface with FEMA’s
- Technological: many trucks loaded with critical supplies allegedly could not reach their destinations because of the lack of Global Positioning Technology
- Logistical: FEMA failed to set up blanket agreements with providers of critical supplies (which necessitated requesting bids, and translated into delivery times of 2-3 weeks)
- Financial: decision makers allegedly decided not to preposition critical supplies to await for the emergency declaration (to avoid having to pay for the supplies)
- Training: many of the individuals directly involved in handling of supplies did not have formal training in logistics
- Institutional: there was not a solid understanding of what each agency was supposed to do
In summary, everybody fumbled

As a result of these problems, improving the efficiency of the logistics of critical supplies to an impacted site necessitates the multidisciplinary study of the problem
Finding: Volunteer organizations saved the day

Horrendous as it was, the Katrina debacle would have been much worse if not by the outstanding work of the volunteer organizations that:

- pre-positioned supplies
- sent experienced and motivated leaders
- demonstrated great creativity, ingenuity and flexibility in the face of disaster
Key Preliminary Recommendations

- Create a Emergency Logistics Training Program
- Improve Robustness and Interoperability of the Federal, State and Local Computer Systems
- Develop Regional Blanket Purchasing Agreements
- Increase Asset Visibility
- Develop Regional Compacts for Pre-Positioning and Sharing of Critical Supplies
- Implement Proactive Donation Coordination Plans
Questions??