The Top Ten Lessons From Large Disasters and Catastrophes: Implications for Resiliency

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Our goal is to avert this...

"We need medicines, something to eat …"

“We are asking for food, water, medicine, shelter and clothing. Aren’t we humans?”

(Pictures taken by JHV 10 days after the disaster)
Major components of our work

- **Fieldwork**: 9/11, Katrina, Indian Ocean, Haiti, Chile, Joplin, Japan, Nepal, etc. etc.
- **Diagnosis and characterization**:
  - Causes of problems encountered
  - How humanitarian logistics take place
- **Quantification**:
  - Aimed at obtaining empirical estimates
  - Provide support to analytical modeling
- **Define mechanisms to improve response**
  - Policy Suggestions → FEMA, Catastrophic Planning Groups
- **Basic research on analytical modeling**
  - To develop Decision Support Tools
The JHV Principle: In Complex Problems, Obvious/Simple Solutions are ALWAYS Wrong
The Top Ten Lessons ...
Main Focus Due to Time Constraints

- Disaster Response is a Socio-Technical Process
- Disasters ≠ ≠ ≠ ≠ ≠ ≠ ≠ ≠ ≠ Catastrophes
- Commercial Logistics ≠ ≠ Post-Disaster Logistics
- Controlling Material Convergence is a MUST
- In Catastrophes: Local Distribution Is the Challenge, Only option: Collaborative Aid Networks
- Effective Private Sector Integration is KEY
- Supply and Demand Are Very Dynamic, Be Ready
- Controlling Precautionary/Opportunistic Buying Helps
- Preventing Collapse of Private Supply Chains Helps
- Comprehensive Approaches Are Needed
Lesson #1: Disaster Response (DR) is More Than a Technical Problem...
DR is a Socio-Technical System (STS)...

A social network of individuals orchestrate operations

The set technical activities performed by the social network

The other socio-technical systems (e.g., transportation, communication) that support the disaster response

Resiliency and Disaster Response depends on the **Social** at the **Technical** at the core of the STS involved
Lesson #2:
Disaster and Catastrophes Are Not the Same...
Disaster: Joplin, Missouri (50,000 residents)
Disaster: Joplin, Missouri (160 deaths)

- Private sector supply chains: partially destroyed
- Multiple entry points
- Challenging but doable local distribution
- Local supplies: partially destroyed
- Small to midsize geographic area
Catastrophe: Minami Sanriku (19,170 residents)
Catastrophe: Minami Sanriku (1,205 fatalities)

- Few entry points
- Most local supplies are destroyed
- Extremely complex local distribution
- Private sector supply chains severely impacted
- Could be an extremely large geographic area
Lesson #4: Controlling Material Convergence is a MUST
What is the problem?

- The efficiency of the flow of high-priority goods depend on the flow of low/non priority cargoes

- The cargo that arrive to a disaster site (estimates):
  - 60% are non-priority,
  - 30-35% are low priority,
  - 5-10% are high priority
“"Donation management is the most difficult part of every disaster," he said of the unsorted mountains of clothes. "We have a little bit of everything."”.... (Caller-Times, 2005).

“Sometimes generosity can go awry.”... In Katrina's immediate aftermath... collection sites along the Mississippi Gulf Coast became “nothing more than dump sites”...” (Times-Piscayune, 2005).
“Nobody seemed to know exactly what was on the boat, or who actually sent it. One rumor was that it was from Costa Rica.” "The boat, it turned out, had mostly packs of everything, right after the Sanitation office had been more might have been more helpful. (National Public Radio, 2010)."
DC in Tohoku: 1/3 of staff handling clothing
"Donations need to keep coming," said spokesperson ...
After Fort McMurray fire, Alberta copes with ‘second disaster’ of misguided donations

Tristin Hopper
Friday, May 13, 2016

With the initial disaster now passed, Alberta evacuee centers are now witnessing the dark side of Alberta’s famed post-disaster generosity, whole truckloads of donated goods that are soiled, unnecessary and getting in the way.

“NO USED DONATIONS CAN BE ACCEPTED,” reads the all-caps warning in a Thursday statement from Edmonton Emergency Relief Services. Similar pleas were posted on the doors of evacuation centers throughout Alberta, with Facebook pages similarly abounding with accounts of supply truckloads being turned away.

“Do not forcibly donate food to shelters in Edmonton,” wrote one volunteer. “We cannot use it and it WILL go to waste.

“NO FOOD or USED CLOTHES
At this time, we ask for tokens, bills, books, toys, blankets, tents, jackets, sleeping bags, and blankets.
THANKS!”

At the Edmonton Emergency Relief Services which is coordinating donation efforts for Fort McMurray evacuees. ED KAISER
Implications

- We need to proactively deal with LP/NP convergence
- The huge volumes of NP-MC produces major impact at entry points, and at the disaster site
  - Impacts at entry points
    - Increased congestion due the vehicular traffic
    - Increased delays due to lack of proper documentation (bill of lading, manifest, consignees)
    - If not controlled → they impact the disaster site
  - Impacts at disaster site
    - Only a fraction of the massive volumes of cargo are actually needed at the disaster site
    - More often than not, the incoming trucks dump the cargo anywhere they can
Lesson #5-A:
In Catastrophic Events the Local Distribution Is The Most Difficult Challenge...
Our estimates are that, about 20,000-40,000 volunteers were needed to distribute supplies.

Semi-trailer (driver and helper) moving 30 tonnes: Santo Domingo-Port-au-Prince (six hours drive)

Six 5 tonne trucks (driver and helper) transport to six PODs (1.5 hours each way)

Helpers split rations, organize distribution, handout rations

Loading: 10 staff-hours (forklifts) Loading: 240 staff-hours (helpers)
Driving: 12 staff-hours Driving: 36 staff-hours
Total: 22 staff hours Total: 276 staff hours

Relative manpower used ⇒ 1:12:60

PODs
Lesson #5-B: Only the Collaborative Aid Networks Can Do the Local Distribution Effectively (Haiti’s Lesson)
Why did this happen?
The earthquake severely disrupted the centers of power (Government, United Nations, Catholic Church) removing the natural interlocutors of foreign (outside) aid groups.

The crisis could have been avoided if the local business class would have helped the foreign aid groups (could not find evidence that they helped much).
ACEs in action
CANs in action: Servicio Social de Iglesias
Implication

After large catastrophic events, the most efficient way to distribute critical supplies at the local level is through the use of the existing social networks

- Extending the mission of these networks is easier than creating a network from scratch
- Outside efforts are doomed to be ineffective for distribution:
  - They are not geared for that, their strength is long-haul
  - Too many PODs are needed: cars are not an option, people cannot walk several miles to get supplies
  - Not enough man-power to man the PODs needed
  - Not enough local know-how
Lesson #6:
Effective Private Sector Integration is Key
(The Chief Lesson from the Tohoku Response)
Post-disaster humanitarian logistic operations

- Inauspicious start, no agency was prepared
- During first 6 days, a very limited amount of critical supplies reached IDPs (some did not get any)
- There was looting...not reported in the press
- The needs were not being met...a crisis underway
- Then, a handful of food distribution companies:
  - Realized that private supply chains were not working, and that the government was not aware of the looming crisis
  - Approached the (surprised) government and volunteered to deliver supplies, it took them a week to start deliveries (others were turned away because of the fuel issue)
  - Volunteered for a month, fell trapped (government did not want to pay, they could not stop the service)
Implications

- Private sector participation is crucial
- For this participation to be effective, certain conditions must be met:
  - Both sides, public and private, must know each other
  - Public sector must plan for private sector help
  - Private sector must have a clear idea what is expected... among others...
Lesson #10:
Comprehensive Approaches Are Needed to Ensure Efficient Logistical Responses
Recommendations

- Create a logistic committee to integrate civic society
- Control material convergence
- Control precautionary/opportunistic buying
- Design scalable response plans
- Preposition critical supplies and equipment
- Develop supporting technologies and systems
Thanks!

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