Logistics in Disasters

Logistics Planning and Execution in a Disaster

Center for Excellence in Disaster Management & Humanitarian Assistance
Intent of this brief is for participants to understand the role humanitarian logistics and the role the U.S. military plays in disaster response operations and the challenges, planning, and preparation involved.

Intent is to provide a better understanding of logistics in disasters, not to convey how logistic support shall be conducted during civilian-military engagements.

We will also discuss who the various players are when it comes to logistics during an HADR operations, both civilian and military and how they differ and organize themselves.
The military provides logistics because they bring UNIQUE military logistics capabilities. The speed of response can also be unique.

Disaster logistics bring about challenges, therefore it is important to note the capabilities of the affected state - not just in logistics, but in planning and preparation for a disaster - hugely impact logistics operations.1

Logistics is a major task for all responders. Military forces (U.S. military for the purpose of this brief), is largely logistic support to the affected state and humanitarian community.2

1. “Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters,” Martin Christopher and Peter Tatham
2. “Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters,” Martin Christopher and Peter Tatham
“One of the starkest messages the tsunami provided was the fact that the effectiveness of humanitarian and response hinges on logistics efficiency.”

3. Humanitarian Logistics. Meeting the Challenges of Preparing for and Responding to Disasters. Edited by Martin Christopher and Peter Tatham.
**Humanitarian Logistics versus Military Logistics**

**HUMANITARIAN LOGISTICS:**
“The process of planning, implementing and controlling the efficient, cost-effective flow and storage of goods and materials as well as related information, from the point of origin to the point of consumption for the purpose of meeting the end beneficiary’s requirements.”

**MILITARY LOGISTICS:**
“The discipline of planning and carrying out the movement and maintenance of military forces.”

**Needs-Based: PULL Method**

**PUSH Method**

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4. “Humanitarian Logistics, Meeting the Challenge of Preparing for and Responding to Disasters,” Martin Christopher and Peter Tatham

# Humanitarian Challenges in Disaster Logistics

<table>
<thead>
<tr>
<th>Needs Assessment:</th>
<th>Lack of emphasis on logistics planning:</th>
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<tr>
<td>- Unpredictable demand</td>
<td>- Short lead time</td>
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<td>- Terms of timing</td>
<td>- Suddenness of demand – large amounts</td>
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<tr>
<td>- Geographic location</td>
<td>- Wide variety of products and services</td>
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<tr>
<td>- Type of commodity</td>
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<td>- Quantity of commodity</td>
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<th>Measuring of efficiency of logistical support:</th>
<th>Shortage of professional logisticians:</th>
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<td>- High humanitarian stakes</td>
<td>- Lack of initial resources in terms of:</td>
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<td>- Timelines in the face of global media</td>
<td>- Supplies</td>
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<td>- High anticipatory attention of the donors.</td>
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<td>- Appropriateness of Donations</td>
<td>- Technology</td>
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<td>- Capacity and funding</td>
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<td>- Logistics is expensive</td>
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</table>
Chemical Spill
War/Conflict
Social Unrest
Slow Onset
Rapid Onset
Disaster Type

Man-Made

Terrorism
Fires
Explosions

Natural

Volcanic Eruptions
Earthquakes
Flash floods
Landslides
Typhoons/cyclones/
Hurricane
Floods

Chemical Spill
War/Conflict
Social Unrest

Droughts
Environmental Degradation
Desertication

Details on each type event
**Characteristics**

In aggregate, more damaging than other natural disasters

Number of people affected by major flood disasters worldwide from 1995 to 2015 – 2.3 billion

Floods attract little international attention

Until the situation reaches a disaster threshold

Difficult to discern between normal and disaster

Floods that affect some Indo-Asia-Pacific countries annually

The Asia Flood Network

USAID/OFDA actively assists with early warning via satellite monitoring

30-50% of USG responses in the Indo-Asia-Pacific

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**Primary Needs**

- Water Rescue
- Shelter
- Search and Rescue (SAR)
- Debris removal
- Medical
- Food
- Water
- Sanitation/Hygiene
- Airlift support

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**Considerations**

- Infrastructure Damage
- Accessibility/Standing water
- Displacement of persons
- Communicable disease
- Mass Casualties

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Earthquakes

Characteristics

- Sudden onset and lack of predictability lead to high levels of casualties
- The timing and full impact of ground shaking is difficult to determine
- Building collapse and liquefaction are the leading causes of damages and injuries
- USG responds mostly to earthquakes with a magnitude of 6.0+9
- Medical treatment, search and rescue comprise the majority of USG support10

Primary Needs

- Search and Rescue (SAR)
- Debris removal
- Trauma/Medical
- Safe open Spaces
- Shelter
- Food
- Water
- Airlift support

Considerations

- Infrastructure Damage
- Accessibility/debris
- Displacement of persons
- Mass Casualties

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10. USAID. In the aftermath of January 2010 earthquake in Haiti, USAID has provided relief, recovery and long-term reconstruction assistance.
Volcanoes

Characteristics

Clear warning signs before erupting
Casualties are low due to precautionary evacuations

Large numbers of people are displaced
Danger zones are evacuated for long periods of time

Huge areas affected for many years

USG response to volcanic eruptions is rare

USG support in the form of scientific expertise

Primary Needs

Search and Rescue (SAR)
Debris removal
Medical
Safe open Spaces
Shelter
Airlift support

Considerations

Infrastructure Damage
Accessibility
Displacement of persons
Pulmonary Health concerns
Ash/Smoke

Characteristics

Among the most devastating hazards on Earth
Size and intensity can cause many casualties across a large area

Damage is complex and difficult to predict
Many factors are key -storm attributes and where it makes landfall

70-80 percent of casualties caused by drowning

USG responds to all strength categories of storms relatively weak tropical systems can have devastating impacts due to flooding

Critical infrastructure likely to be non-operational
In the impact area

Pre-and post-storm actions reduce vulnerability
USG can perform these actions without being on the ground

Primary Needs

Search and Rescue (SAR)
Debris removal
Trauma
Shelter
Food
Water
Sanitation/Hygiene
Airlift support

Considerations

Infrastructure Damage
Accessibility/debris
Displacement of persons
Standing water

Tsunamis

Characteristics

Unpredictable nature affects tsunami preparedness
Warnings issued minutes to hours before impact, resulting in variable estimates of casualties and damages\(^\text{15}\)

Low lying coastal areas are high risk

Particularly damaging to coastal infrastructure

USG responded to 7 tsunamis in past 10 years
In the Indo-Asia-Pacific; 2 were catastrophic, 3 involved DoD support\(^\text{16}\)

Primary Needs

Search and Rescue (SAR)
Debris removal
Trauma/Medical
Shelter
Food
Water
Sanitation/Hygiene
Airlift support

Considerations

Infrastructure Damage
Accessibility/Debris
Displacement of persons
Standing water
Mass Casualties

Drought

Characteristics

Slow onset
Low levels of precipitation or prolonged drought conditions may lead to soil degradation and prolonged food shortages.

Particularly damaging to rural populations

Conflict
May lead to disputes, social unrest and violence

Primary Needs

Water
Food
Security
Shelter
Airlift support

Considerations

Relocation of persons
Famine


Characteristics

Localized event
- Oil spills
- Radiation Leaks
- Explosions
- Fires
- Hazardous Materials

Emergency is typically confined to a specific location

Sudden Onset Emergency

May cause secondary and tertiary events: Fires, Additional Explosions, Hazardous Material Release

Response requires specialized personnel: Trained in hazardous materials handling and removal

Primary Needs

Specialized equipment
- Medical
- Shelter
- Decon/Hazmat
- Airlift support

Considerations

- Infrastructure Damage
- Exposure
- Accessibility
- Displacement of persons


**Conflict**

**Characteristics**

Localized event or Trans-National event

Conflict is typically confined to a geographic location

Sudden Onset Emergency/ Progressive

May cause secondary and tertiary events: Violence, Internationally Displaced Persons, Refugees, Armed conflict, civil unrest, explosions, fires, etc.

Response requires specialized personnel: Trained in armed conflict and humanitarian response

Access to affected population may be limited or result in resistance

**Primary Needs**

Water
Food
Security
Shelter
Medical
Airlift support

**Considerations**

Infrastructure Damage-Fires/explosions
Famine
Accessibility-Armed conflict
Displacement of persons-IDPs
Refugees
There is a correlation between the type of disaster and its impact on health;

Population displacements and environmental changes may increase the risk of a spread in communicable diseases.

In general, though, epidemics are not caused by natural disasters;

Immediate and potential health hazards in the aftermath of a disaster tend to strike at different times.

Ebola- Monrovia, Liberia

U.S. military - medical logistics for the Ebola outbreak

Any disaster can “become” a Public Health disaster ....now for Logistics Challenges
Distance Matters

- Inland Event
- Nepal Earthquake, 2015


Photo credit: The World Food Program. WFP Logistics, We Deliver. PowerPoint Presentation
Distance Matters

- **Oceanic Event**
- **Super Typhoon Haiyan**
- **Access by sea and air**
  - Evacuation Routes
  - Supply Routes
Considerations

- Coordination
  - Intergradation of assets
- Damage to main supply hubs
  - Resources depleted
- Potential failure of local government


Scale Matters
Scale Matters

Small Island State

- Vanuatu – Pam
  - CAT 5 Cyclone
  - 167 thousand persons affected
    - More than 50% of total population affected
    - Erromango Island- 90 % of shelters were destroyed
    - Tanna Island- 50 % of shelters were destroyed


Infrastructure, equipment, accessibility and transportation

Essential to plan for the arrival, storage, and distribution of emergency supplies

Example: Nepal Earthquake-Preliminary Damage Assessment-Roadways

Photo Credit: Pacific Disaster Center. 2015.
Post disaster

- Roads and passages will be impassable
- Debris, landslides, standing water, etc.
- Plan to incorporate alternative bypass routes to reach the affected areas

Populations

- Isolated and without adequate resources

Seaports and Airfields

- Passenger terminal at Sendai Airport post tsunami in Japan on March 11, 2011
  - Inoperable
    - Limited accessibility
    - Damage to infrastructure
    - Runway debris
  - Secondary disasters
    - Fires
    - Explosions
    - Flooding


Seaports and Airfields

- Port-au-Prince, Haiti Port after 7.0-magnitude earthquake in 2010

- Inoperable Port
  - Not accessibility
  - Damage to infrastructure
  - Virtually all of the structures, not made out of concrete or steel were destroyed

Next are logistics capabilities/enablers in HADR....
Joint Task Force-Port Opening (JTF-PO)

- JTF-PO Aerial Port of Debarkation (AOD)
  - This capability is unique to the military and one of the most utilized in recent large scale disasters (Haiti and Nepal):
    - Has a 12-hour response time
    - Consists of elements from the following:
      - Air Mobility CRG
      - 55-person surface element (U.S. Army)

- JTF-PO seaport of debarkation (SPOD)
  - 12-hour response time
  - Capabilities provided include:
    - Joint-trained and lead element
    - Assess and open a distribution node and network
    - Organic or contract transportation
    - Joint assessment team conduct focused port and distribution assessments
    - Conduct movement-control operations and cargo-onward movements
    - In-transit visibility of forces and cargo at both port and debarkation and forward distribution node

JTF-PO was used in Haiti response
Joint Logistics Over-the-Shore (JLOTS)

- **JLOTS Capabilities**
  - JLOTS provides a unique capability
  - Offsets port denial
  - Offsets port draft
  - Offsets port congestion
  - Provide Intra-theater Lift
  - Augment an established port
  - Supplement a degraded port
  - Create a port

- **JLOTS Equipment**
  - Floating causeway ferry discharge
  - RO/RO Discharge Facility
  - Elevated Causeway
  - Logistics Support Vessel

International Movement

Overflight, Customs, and Reception
- Processes vary for each
- United Nations (UN) guidelines

Supplies and Commodities provided/needed
- Know the national decision process - sometimes it's political
- What to allow / not allow in

Example: Nepal Earthquake - International Aid Message
- Government of Nepal stated they did not need more foreign rescue teams to help with search and rescue efforts (2015)\textsuperscript{26}

Warehousing and Supply Chain Management

- **Local**
  - Affect State assets
  - Pre-determined or spontaneous if pre-planning is absent
- **WFP- UNHDR**
  - Pre-staged supplies in pre-determined locations
  - Onsite temporary or permanent warehousing solution
  - Often pre-planned
- **Commercial**
  - Donations/relief supplies-public locations
  - Designed after or at time of event
- **Non-Government Organizations (NGOs)**
  - Each will have a staging/warehouse location
  - Designated upon set-up in affect state

Photo Credit: http://soldiersangelsgermany.blogspot.com/2010/01/afsoc-combat-controllers-direct-800.html
UN WFP Logistics Cluster is a Coordination mechanism hosted by WFP

- Activated when there are response and coordination gaps in addressing humanitarian needs
- Provides for strategic coordination, information management and the facilitation of common logistics services by road, air, and sea
- Provides for the humanitarian community as a whole

United Nations Humanitarian Response Depot (UNHRD)

- A network of strategically located hubs for prepositioning relief items and humanitarian support equipment.
- Prepositioning helps to facilitate the PULL system vice defaulting to a push system which can clog up Main Supply Hubs.

Photo credit: The World Food Programme. WFP Logistics, We Deliver. Brief.
Prepositioning

World Food Program- United Nations Humanitarian Response Depots (UNHRD):
- Africa, United Arab Emirates, Malaysia, Spain, Panama, Italy

USAID’s warehouses of emergency relief items are strategically located in:
- Italy, Malaysia, United Arab Emirates, Florida, USA

ASEAN- AHA Center Warehouse:
- Located in Subang, Malaysia with World Food Program Depot
International Agreements

- Acquisition and Cross-Service Agreements (ACSA)
- Mutual Logistics Support Agreements in the Pacific (MLSA) for military cross-support

- Relationships between nations can be formalized by treaty or other forms of arrangement
- Some are binding in international or national law and contain mandatory language whereas others rely on political and moral obligation
- It is important that the legal status of the arrangement is clearly understood by both parties

Transition Key Points

- Consider transition planning **as soon as possible**
- Coordinate closely with the **Lead Federal Agency, USAID OFDA**
- **Based on strong assessments, understood needs, clear objectives**
- Tasks handed off deliberately to an adequate organization; Affected State, United Nations, NGO, civilian contract
- **Develop milestones with defined criteria for the transfer of tasks and conduct monitoring** to ensure sustainment of transitioned functions
- Some tasks are simply completed and do not require handoff
- Diminishing MITAMS from USAID OFDA
- **Transparent** in transition planning, ensure the Affected State and aid agencies understand the deliberate plan (time, capacity, funding, etc.)

Next are Transition Slides on the **DOD Response to Ebola in West Africa**....
General Rodriguez told me when I was coming over here, “You are going to bring speed, flexibility, and confidence. That’s what you are going to bring to Liberia from the DOD perspective and the joint force. But what I want to make sure you don’t do is put in a capacity or capability that can’t be sustained.”

- Major General Gary Volesky, JFC-UA, Commanding General

- Mission exit was considered from the beginning
- USAID identified potential partners within the GOL or an NGO
- JFC-UA established specific handover criteria for the eventual reassignment of each specific task
- JFC-UA’s disciplined regard to sustainability prevented an unintentional expansion of tasks and responsibilities (mission creep)
USAID/DoD/JFC Transition Plan

DoD Mission: Support the United States Agency of International Development (USAID) in Liberia to assist the U.S Government’s Foreign Humanitarian Assistance / Disaster Relief (FHA/DR) efforts to contain the Ebola Virus Disease (EVD) IOT prevent EVD from spreading outside of the region, alleviate human suffering, and promote internal and regional stability. O/O transition the Joint Force Command (JFC) to designated entities.

OCTOBER            NOVEMBER            DECEMBER            JANUARY            FEBRUARY            MARCH

Phase 1: Initial Response  
Phase 2: Support USAID Relief Efforts  
Phase 3: Enable Transition/Retrograde  
Phase 4: Majority of JFC Redeploy

29 Jan: Joint Forces Command (JFC) Transition Decision

Strategic Decision Points/Milestones

Command and Control (C2)

Decision

Milestone Anticipated

Milestone Complete

Planned Transition

Transition Complete

Engineering

MMU

Ebola Treatment Units (10/10 complete)

Training Center (754)

Mobile Training Teams (785)

Training

Electrode Support

Ebola Treatment Unit Sustainment

Monrovia Medical Unit Sustainment

Personal Protective Equipment Procurement (1.4 M sets)

Dakar Intermediate Staging Base (ISB)

Logistics

Labs

Liberia: CTR/CBEP-funded USAMRIID personnel to augment national laboratory (LIBR)

Liberia: Army 1st AML provides 4 mobile laboratories

Liberia: CTR/CBEP-funded 2 mobile labs staffed by NMRC

Liberia: CTR/CBEP-funded USAMRIID personnel to augment national laboratory (LIBR)

Transitioned to World Health Organization, Gov of Liberia, USAID NGOs on 1 Jan 15

WFP & USAID Partners

USAID contractor

USAID (in-place reserve)

ISB transition to Cooperative Security Location

CTR/CBEP train/equip LIBR

Redeploy to CONUS or transition to other provider

CTR/CBEP train/equip HN MOH

CTR/CBEP train/perform needs assessment for HN MOH
Summary

- Logistics account for 80% of any HADR response
- Different hazards have different requirements
- Logistics challenges are compounded by infrastructure damage
- NOT enough time is spent planning for disasters
- NOT enough time is spent training for disasters
Questions/Comments