Measurements in Humanitarian Logistics

Dr. Julie Swann
jswann@isye.gatech.edu
Lakshmi Ganesan
lakshmi.ganesan@gatech.edu

Ideas Portrayed

- Defining Humanitarian Logistics
- Frequently Observed Scenario
- Key Functional Areas for Humanitarian Logistics
- Design Principles for Metrics
- Data Collection to Support Humanitarian Logistics
- Guiding Principles for Humanitarian Logistics Organizations
- Understanding Metrics through Classification
- “Power” of Metrics
Defining Humanitarian Logistics

Wikipedia definition:

Humanitarian logistics is a branch of logistics which specializes in organizing the delivery and warehousing of supplies during natural disasters or complex emergencies to the affected area and people.

Humanitarian Logistics is a branch of logistics that specializes in all support (e.g., procurement, warehousing, transportation and distribution) of supplies during natural disasters, complex emergencies and for developmental programs.

Frequently Observed Scenario

Logistics Support
- Needs Assessment
- Resource Mobilization
- Procurement
- Transportation & Distribution

Relief/Developmental Program Success

How do the Logistics activities translate into Program Performance???
Frequently Observed Scenario

**Difference between Humanitarian Logistics and Commercial Logistics:**

- Profit Motive
- Point from which demand is driven

**Why is it difficult to measure performance?**

- Gap in the connection between logistics and program
- Data and infrastructure limitations
- Two customers
  - Victims
  - Donors

Key Functional Areas for Humanitarian Logistics

- **Demand driven by the relief/program**
- **Resource Mobilization**
- **Procurement**
- **Transportation**
- **Distribution**
- **Needs Assessment**

- **What, where, how much**
- **Financial, Staff, equipments, supplies**
- **Local, regional, international**
- **International, In country**
- **Warehouses, DC’s, other delivery points and last mile**

Inputs from Prof. Julie Swann’s lecture on health and humanitarian applications (Aug 2009)
“Measurement is the first step that leads to control and eventually to improvement. If you can’t measure something, you can’t understand it. If you can’t understand it, you can’t control it. If you can’t control it, you can’t improve it.”

- H. James Harrington
Design Principles for Metrics

Understandable
- The metrics should be easy to interpret/understand for people from a variety of backgrounds

Based on data collected
- It is difficult to obtain data in the humanitarian world, hence the metric must closely portray the data that would be obtained during the course of action.

Actionable/Controllable
- The metric should help in decision support, e.g., transportation mode v/s distribution priority

Practical & Usable
- The metrics should be easy to track/record and they should be simple to use given technology or resource limitations

Data Collection to support Humanitarian Logistics

"In God we trust, all others bring data." - W. Edwards Deming

Tools for data collection:
- Paper
- Excel
- Web based systems
- ERP systems

Requirements for data collection
- Ensure that there is an organizational system in place
- Ensure technological infrastructure
- Provide training for the employees
- Assure the employees that measuring efficiencies is purely for process improvement and not as a judgment of their performance

Quality of data collected
- Accurate & reliable
- Accessible
- Understandable
- Easily reportable
Guiding Principles for Humanitarian Logistics Organizations

- Meet needs (speed, quality, etc.) at the minimum cost possible
- Deliver when required
- Ensure accuracy and completeness of order, forecasting, etc.
- Plan for variability in demand
- Standardize products and processes whenever possible

The Guiding Principles provide goals to the logistics organization that determine its structure, drive its behavior and define its role in providing support to programs.

Classification of Disasters

Humanitarian Logistics
  - Relief Logistics
  - Development Logistics
  - Natural Disaster
    - Late warning, Sudden Onset
      - Unpredictable
      - Predictable
    - Early warning, early action
  - Complex Emergencies
    - Emergency Relief
    - Prolonged Relief

EXAMPLES
- Earthquakes, Tsunami
- Hurricanes, Floods
- Famine, Drought
- Terrorist attacks
- Refugee crisis
EXEMPLARY

Sample Goal of Organization

Forecasting, quick & accurate response

Needs Assessment

Disaster preparedness (based on predicted magnitude of disaster)

Resource Mobilization

Disaster preparedness (disaster alerts, inventory pre-positioning)

Procurement

Fast sourcing (e.g., frame agreements)

Transportation

In country & last mile

Distribution

Strategic end point locations

SAMPLE METRIC

Cost / freight transported (track this over time)
**Example 1:** Earthquakes, Tsunami

**Sample Goal of Organization:** Quick and accurate response

**Needs Assessment:** Accurate information collection & quick information dispersion

**Resource Mobilization:** Agile (respond to short-term changes in demand quickly)

**Procurement:** Agile, adequate & adaptable (adjust Supply Chain design to changes in program requirement)

**Transportation:** Speedy transportation to delivery points

**Distribution:** Optimal mix of SKU's pertinent to the disaster

**Sample Metric:** Lead time for supplies to reach point of distribution

---

**Example 2:** Refugee crisis

**Sample Goal of Organization:** Sustainability and follow declaration of human rights

**Needs Assessment**

**Resource Mobilization**

**Procurement**

**Transportation**

**Distribution**

**Sample Metric**
Humanitarian Logistics

Natural Disaster

Late warning, Sudden Onset

Early warning, early action

Complex Emergencies

Emergency Relief

Relief Logistics

Development Logistics

Unpredictable

Predictable

EXAMPLES

Refugee crisis

Sample Goal of Organization

Sustainability and follow declaration of human rights

Needs Assessment

Based on the type (international / internal) and number of refugees

Resource Mobilization

Food, shelter, monetary benefits

Procurement

Prepositioning & long term contracts

Transportation

Distribution

Determine optimal re-order points based on camp size & needs

SAMPLE METRIC

Level of donor interest over time

EXAMPLES

Earthquakes, Tsunami

Hurricanes, floods

Famine, Drought

Terrorist attacks

Refugee crisis

Sample Goal of Organization

Quick and accurate response

Forecasts, quick & accurate response

Quality control, adequacy, sustainability

Mitigation, quick and accurate response

Sustainability and follow declaration of human rights

Needs Assessment

Accurate information collection & quick information dispersion

Disaster preparedness (based on predicted magnitude of disaster)

Magnitude projection dependent

Based on severity and urgency of crisis

Based on the type (international / internal) and number of refugees

Resource Mobilization

Agile (respond to short-term changes in demand quickly)

Disaster preparedness (disaster alerts, inventory pre-positioning)

Schedule based dispersion of supplies

Timely emergency services

Food, shelter, monetary benefits

Procurement

Agile & adequate (adjust Supply Chain design to changes in program requirement)

Fast sourcing (e.g., frame agreements)

Cheapest sourcing option

International & gift-in-kind

Prepositioning & long term contracts

Transportation

Speedy transportation to delivery points

In country & last mile

Least expensive transportation

Distribution

Optimal mix of SKU's pertinent to the disaster

Strategic end point locations

Standardized SKU's

Rapid set-up

Determine optimal re-order points based on camp size & needs

SAMPLE METRIC

Load time for supplies to reach point of distribution

Cost / freight transported (track this over time)

If Complete orders delivered when needed

If distribution points set up / unit time

Level of donor interest over time
Classification of Development Programs

Humanitarian Logistics

- Relief Logistics
- Development Logistics

Health
Educational
Agriculture
Micro Finance

EXAMPLES
- HIV, Malaria Programs
- Early Childhood Development (UNICEF)
- Food-for-assets (WFP)
- Grameen Bank Program

Sample Goal of Organization
Maximize # people fed, manage agricultural/food fulfillment

Needs Assessment
Based on quantity of requirement, labor & transportation availability

Resource Mobilization
Produce, seeds, fertilizers, labor, transportation

Procurement
Based on funding, availability

Transportation
Route optimization

Distribution
Adapts to seasonality & variability

SAMPLE METRIC
Price of Fertilizers/acre of land
Humanitarian Logistics
  Relief Logistics
  Development Logistics

Health
Educational
Agriculture
Micro Finance

EXAMPLES
HIV, Malaria Programs

Sample Goal of Organization
Maximize coverage and ensure completion of program needs

Needs Assessment
Consider regional population & individual clinic requirements

Resource Mobilization
Medicines & personnel

Procurement
Identify ideal sources based on cost, lead time and availability

Transportation
Mobile medical fleet

Distribution
Strategic locations (schools, etc.)

SAMPLE METRIC
# Stock outs of medicine OR
% of drugs delivered at the right time to the right clinic
Humanitarian Logistics
  Relief Logistics
  Development Logistics

Health
Educational
Agriculture
Micro Finance

Examples
Grameen Bank Program

Sample Goal of Organization
Facilitate business expansion through small loans

Needs Assessment
Analyze the number and magnitude of businesses with funding requests

Resource Mobilization
Establish partners, networks and credibility

Procurement
Micro lenders and donors, VC’s

Transportation
Ensure funds visibility and sustainability

Distribution
Through NGO’s, direct distribution

Sample Metric
% of funds returned to the organization
Humanitarian Logistics

Relief Logistics

Development Logistics

Health

Educational

Agriculture

Micro Finance

EXAMPLES

HIV, Malaria Programs
Early Childhood Development (UNICEF)
Food-for-assets (WFP)
GrameenBank Program

Sample Goal of Organization

Maximize coverage and ensure completion of program needs
Provide quality education, maximize # children tutored
Maximize # people fed, manage agricultural/food fulfillment
Facilitate business expansion through small loans

Needs Assessment

Consider regional population & individual clinic requirements
Based on potential students
Based on quantity of requirement, labor & transportation availability
Analyze the number and magnitude of businesses with funding requests

Resource Mobilization

Medicines & personnel
Teachers, school supplies, schools
Produce, seeds, fertilizers, labor, transportation
Establish partners, networks and credibility

Procurement

Identify ideal sources based on cost, lead time and availability
Good recruiting programs, secure grants
Forecast of funding
Micro lenders and donors, VC’s

Transportation

Mobile medical fleet
Route optimization
Ensure funds visibility and sustainability

Distribution

Strategic locations (schools, etc.)
Adapts to seasonality & variability
Through NGO’s, direct distribution

SAMPLE METRIC

# Stock outs of medicine OR % of drugs delivered at the right time to the right clinic
Time taken to mobilize all the resources required for educational purposes
Price of Fertilizers / acre of land
% of funds returned to the organization

Use of these Metrics: Let us take an example of a metric and understand how it is used to make decisions to improve efficiencies
Use of these Metrics: Let us understand how metrics are used to make decisions to improve efficiencies

Questions:

How long do you expect my case to go on?

Don’t be afraid to ask questions.