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Mini MBA Humanitarian Logistics and Supply Chain: supplying fast, well and fairly

Course handout · Week 9 : Preparedness, prepositioning and last-mile distributions

A programme of exactly 3 months (12 weeks, 144 hours) to lead a humanitarian supply chain: mapping and landed cost, demand forecasting and safety stocks, procurement and competitive bidding, Incoterms and contracts, transport, warehouses and inventories, fleet and fuel, customs and exemptions, prepositioning and distributions, health products and the cold chain, performance, costs and the environment, constrained contexts and data protection. Corrected numerical exercises, three monthly exams with case studies, and a verifiable diploma from the Humanitarian Academy.

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Week 9 : Preparedness, prepositioning and last-mile distributions

Objectives

- Size a contingency stock and choose where to preposition it, weighing cost against speed.
- Organise a safe, dignified and accountable in-kind distribution, from calculating quantities to proof of handover.
- Choose between in-kind assistance, vouchers and cash transfers, and draw the logistical consequences.

Logistics preparedness

Preparedness means doing, before the crisis, everything that would slow down the response afterwards:

- **Framework agreements** signed with suppliers, transporters, freight forwarders, warehouses.
- **Country logistics assessment**: ports, airports, roads, storage capacity, suppliers, customs (the Logistics Cluster publishes Logistics Capacity Assessments by country).
- **Contingency stocks** for the first days.
- **Emergency procedures** approved in advance (raised thresholds, temporary delegations).
- **Rosters** of trained staff who can be mobilised.
- Regular **simulation exercises**.

Several studies on prepositioning and preparedness have shown that investing before a crisis saves days and reduces response costs, in particular by avoiding air freight. The argument must nevertheless be quantified for each context.

Sizing a contingency stock

A contingency stock is sized on the basis of a **planning scenario**: number of people affected, share the organisation will cover, items and the period to be covered before normal supplies arrive.

Example. Scenario: a flood affecting 30,000 households; the organisation commits to covering 20% for the first 4 weeks, until regional purchases arrive. Kits per household: 1 hygiene kit, 1 kitchen kit, 2 tarpaulins, 2 mosquito nets. Households covered: 6,000. Stock: 6,000 hygiene kits, 6,000 kitchen kits, 12,000 tarpaulins, 12,000 mosquito nets.

Cost of the stock. Value: 6,000 × (18 + 25) + 12,000 × (12 + 4) = 258,000 + 192,000 = 450,000 USD. Annual holding cost (storage, insurance, rotation, losses, capital) often estimated at 15 to 25% of the value: at 20%, 90,000 USD per year. This cost is justified if the stock makes it possible to avoid air freight or to gain the critical days.

Items with a limited shelf life (food, medicines, chlorine) must be **rotated**: integrated into regular programmes before they expire, and replaced.

Where to preposition?

Three levels of stock are combined:

- **Global or regional**: humanitarian response depots (for example the UNHRD network), regional warehouses of the major organisations. Economies of scale, but lead time and cost of transport to the country.
- **National**: a warehouse in the capital or near the port. A good compromise.
- **Local**: small stocks in at-risk areas. Very fast, but costly, exposed to looting and humidity.

Trade-off example. Option A: regional stock, emergency air transport (5 days, 2.80 USD/kg). Option B: national stock, road transport (3 days, 0.25 USD/kg), additional holding cost of 30,000 USD per year. For a 200 t response: A costs 200,000 × 2.80 = 560,000 USD in freight; B costs 200,000 × 0.25 = 50,000 USD. If such a response occurs at least once every 10 years, B is already more economical (510,000 USD saved versus 300,000 in holding costs over 10 years), and faster.

Organising an in-kind distribution

A successful distribution is prepared with the programme team and the community:

- A verified **beneficiary list**, distribution cards or tokens, without duplicates.
- **Calculation of quantities** per site, with a small margin (for example 2 to 3%) for errors and vulnerable cases identified on the day.
- **Choice of site**: accessible, safe, shade and water, separate queues, access for older people and people with disabilities, reasonable distance from home.
- **Organisation**: waiting, verification, handover and exit areas; female and male staff; display of entitlements (what each person should receive).
- **Accountability**: complaints committee, telephone line, explicit prohibition on demanding anything in exchange (sexual exploitation and abuse).
- **Documentation**: distribution list signed or thumb-printed, reconciliation of quantities issued, distributed and returned.

Site throughput. One handover point serves about 1 household per minute. 2,400 households in a 6-hour day require 2,400 / 360 ≈ 7 handover points. It is better to spread over two days or two sites than to make people wait for long hours in the sun.

Reconciling and monitoring after the distribution

After each distribution, logistics and programme **reconcile**: quantities issued from the warehouse = quantities distributed + quantities returned + justified losses.

Example. Issued: 2,500 kits. Signed list: 2,410 households. Returned to the warehouse: 70 kits. Discrepancy: 2,500 − 2,410 − 70 = 20 kits unaccounted for (0.8%). Above a low

tolerance, investigation: counting error, kits handed over without a signature, diversion.

Post-distribution monitoring (PDM) checks with a sample of households: did they receive the right quantity? are the items suitable? did they sell them (a sign of a poorly identified need)? were they subjected to pressure? Its results improve subsequent distributions.

> A distribution without reconciliation or monitoring does not prove that the aid arrived; it only proves that it left the warehouse.

In kind, vouchers or cash transfers?

The choice of **modality** changes the whole supply chain:

Modality	Conditions	Logistical consequences
In kind	Failing markets, specific items (medicines, shelter), acute emergency	Full supply chain: procurement, transport, storage, distribution
Vouchers	Functioning markets but a need to restrict items or guarantee quality	Contracts with traders, price and quality control, payment of traders
Cash transfers	Functioning markets, safe access to money, acceptance	Contracts with financial service providers, price monitoring, management of beneficiary data

Logistics remains essential in cash transfers: **market supply chain analysis** (can traders restock?), contracts with payment providers, and sometimes support to traders. The cost-transfer ratio (delivery costs / amount transferred) of a cash programme is often well below that of in-kind assistance, but the comparison must include all costs and the effect on markets.

Exercise: preparing for a cyclone season

Situation. Scenario: 40,000 households affected; your organisation covers 15% for 3 weeks. Per household: 1 shelter kit (30 USD, 15 kg), 1 hygiene kit (20 USD, 8 kg). Options: regional stock, air shipment at 3 USD/kg; or national stock, road transport at 0.30 USD/kg, with a holding cost of 20% per year of the stock value. Distribution planned at one main site, over 2 days of 6 hours.

Tasks. 1) Quantities and value of the stock. 2) Transport cost under each option. 3) Annual holding cost of the national stock and the number of years "covered" by the transport saving from a single response. 4) Handover points needed.

Answer. 1) 40,000 × 15% = 6,000 households; 6,000 shelter kits and 6,000 hygiene kits; value 6,000 × 50 = 300,000 USD; weight 6,000 × 23 = 138,000 kg. 2) Air: 138,000 × 3 = 414,000 USD; road: 138,000 × 0.30 = 41,400 USD. Saving: 372,600 USD. 3) Holding: 20% × 300,000 = 60,000 USD per year; a single response that avoids air freight covers 372,600 / 60,000 ≈ 6.2 years of holding. In an area hit on average every 2 to 3 years, the national stock is clearly justified (and faster). 4) 6,000 households over 2 × 360 minutes = 720 minutes; at 1 household per minute per point, 6,000 / 720 ≈ 8.3 are needed, so 9 handover points (or 3 days with 6 points).

Key takeaways

- Prepare before the crisis: framework agreements, assessments, stocks, emergency procedures, staff, simulations.
- Contingency stock = scenario × share covered × items × period until normal supplies arrive.
- Holding cost often 15 to 25% of the value per year, to be compared with the air freight avoided and the days gained.
- Distribution: verified list, safe and accessible site, accountability, documentation, reconciliation.
- The modality (in kind, vouchers, cash transfers) changes the whole supply chain; analyse the markets.

Quiz

1. 10,000 households affected, 25% coverage, 2 tarpaulins per household. Tarpaulins to stock:
   A. 2,500
   B. 5,000
   C. 10,000
   D. 20,000

2. Stock of 200,000 USD, holding cost 20% per year. Annual cost:
   A. 4,000 USD
   B. 20,000 USD
   C. 40,000 USD
   D. 200,000 USD

3. 1,800 households to serve in 5 hours, 1 household per minute per point. Handover points:
   A. 6
   B. 5
   C. 4
   D. 9

4. Issued 1,000 kits; signed list 960; returned 30. Kits unaccounted for:
   A. 40
   B. 30
   C. 0
   D. 10

5. Households are reselling the items received on a large scale. This mainly indicates:
   A. Fraud by households
   B. A poorly identified need or an unsuitable modality
   C. Markets working well
   D. A transport error

Quiz answers : 1. B · 2. C · 3. A · 4. D · 5. B