HUMANITARIAN ACADEMY · HUMANITAIRES JOBS

Humanitarian Mini MBA: leading a humanitarian organisation

Course handout · Week 8 : Humanitarian supply chain: strategic procurement, stock and total cost

A leadership programme of exactly 3 months (12 weeks, 144 hours): leadership, strategy, project cycle, MEAL, finance and donor budgets, compliance and fraud, resource mobilisation, supply chain, HR and safeguarding, risk and security, negotiation and advocacy, change and governance. Corrected numerical exercises, three demanding monthly exams with case studies, and a verifiable diploma from the Humanitarian Academy.

https://humanitairejobs.org/en/academy/mini-mba-humanitaire/semaine-8/

Free document from the Humanitarian Academy. It may be printed and shared freely for training purposes, without modification.

Week 8 : Humanitarian supply chain: strategic procurement, stock and total cost

Objectives

- Steer the supply chain as a strategic issue: lead times, costs, quality, risks and environmental impact.
- Design a procurement strategy (Kraljic matrix, framework agreements, prepositioning) and apply donor thresholds and procedures.
- Size stock and transport with simple calculations (safety stock, reorder point, total cost of ownership, Incoterms).

Why the supply chain is a leadership issue

It is commonly estimated that logistics and procurement account for a major share of humanitarian spending, often cited at around 60 to 80% (van Wassenhove, 2006). A 5% gain on that spending is often worth more than all efforts to cut headquarters costs. The supply chain also determines the **speed** of the response, the **quality** of the aid and a large part of the **fraud risks**.

The central tension is **speed versus cost**: emergency air freight often costs 5 to 10 times more than sea freight, but delivers in days instead of weeks. Leaders must set the rules of the game in advance: which categories are prepositioned, when air freight is justified, which lead times are acceptable for each type of intervention.

Key indicators to track at country level: **processing time** of purchase requests (from request to delivery), **on-time in-full delivery rate**, **share of purchases under framework agreements**, **stock turnover and expiry**, **logistics cost per tonne delivered** and the **compliance rate** of procurement files at audit.

Procurement strategy: Kraljic and framework agreements

The **Kraljic matrix** (1983) classifies purchasing categories by their **financial impact** and their **supply risk**:

Quadrant	Humanitarian examples	Strategy
Non-critical (low impact, low risk)	Office supplies, small equipment	Simplify: catalogues, purchasing cards, bundling
Leverage (high impact, low risk)	Tarpaulins, hygiene kits, fuel in well-served areas	Competitive tendering, multi-year framework agreements, joint inter-agency procurement
Bottleneck (low impact, high risk)	Spare parts for specific vehicles, rare medicines	Secure supply: safety stock, alternative suppliers, standardisation
Strategic (high impact, high risk)	Therapeutic food, essential medicines, transport in conflict areas	Lasting partnerships, prepositioning, continuity plans

Framework agreements are the most powerful tool for reconciling speed and compliance: competition takes place once, in advance, and orders are then placed within a few days during the crisis. Donor procedures (for example the rules applicable to the European Commission's humanitarian partners, or the thresholds set by each organisation) provide **thresholds** above which the procedure becomes heavier: direct purchase, consultation of several suppliers, local open tender, then international tender. They also provide **emergency procedures** (justified direct negotiation), which must be documented with a waiver note.

> For the manager: every waiver from the normal procedure must be justified in writing, approved at the right level and filed. A real but undocumented emergency becomes, at audit, an ineligible cost.

Stock management: formulas and decisions

Three calculations cover most stock decisions:

- **Safety stock** (simple approach): average daily consumption × lead-time margin, or more precisely z × standard deviation of demand during the replenishment lead time.
- **Reorder point** = average daily consumption × replenishment lead time + safety stock.
- **Economic order quantity** (Wilson formula): EOQ = √(2 × D × S / H), where D is annual demand, S the fixed cost of an order and H the annual cost of storing one unit.

Example. A nutrition programme consumes 40 cartons of therapeutic food per day. The replenishment lead time is 60 days; a safety stock of 20 days of consumption is chosen. Reorder point = 40 × 60 + 40 × 20 = 2,400 + 800 = 3,200 cartons: as soon as stock reaches 3,200 cartons, an order must be placed. If the lead time rises to 90 days because of a port disruption, the reorder point rises to 40 × 90 + 800 = 4,400 cartons.

The **FEFO** rule (first expired, first out) is a must for medicines and food. Physical inventories must be at least quarterly, and unannounced for sensitive stock, with reconciliation against stock cards and the system.

Transport, Incoterms and total cost of ownership

The **total cost of ownership** (TCO) adds to the purchase price all costs up to use: transport, insurance, duties and taxes (often waived for registered NGOs, but with administrative delays), storage, losses, maintenance and disposal. A cheaper international supplier can cost more than a local supplier once all costs and lead times are counted; conversely, a local product of insufficient quality is costly in losses and reputational damage.

The International Chamber of Commerce's **Incoterms 2020** define how costs and risks are shared between seller and buyer. The most used: **EXW** (the buyer takes charge of everything from the factory), **FCA** (the seller hands the goods, cleared for export, to the carrier named by the buyer), **CIF** (the seller pays freight and insurance to the port of destination, but risk passes to the buyer at loading), **DAP** (delivered at the agreed place, not cleared for import), **DDP** (delivered cleared, duties paid). Choosing the wrong Incoterm can leave the NGO carrying a risk it thought had been transferred.

TCO example. 10,000 tarpaulins: international offer at USD 9.50 per unit FCA, plus USD 2.80 freight and insurance, USD 1.20 clearance and inland transport, lead time 10 weeks; regional offer at USD 12.60 delivered DAP warehouse, lead time 3 weeks. International TCO: USD 13.50; regional: USD 12.60 plus about USD 0.40 clearance = USD 13.00. The regional offer is cheaper and faster, provided that quality meets the specifications (inspection and samples).

Risks, localisation and sustainability of the supply chain

Mapping **supply chain risks** covers: dependence on a single supplier or corridor, price and exchange-rate volatility, road insecurity, import restrictions, seasonal access and fraud. The responses: several qualified suppliers, alternative corridors, regional prepositioning, indexation clauses, insurance, and coordination through the **Logistics Cluster** (information sharing on access, common transport and storage services).

Cash transfers shift part of the supply chain to local markets: the decision is made with a market analysis (traders' capacity to absorb demand, integration, prices) and continuous price monitoring. They do not remove risks: they shift them to payment providers and data protection.

Environmental sustainability is becoming a donor requirement: the Climate and Environment Charter for Humanitarian Organizations (2021) commits signatories to reducing their emissions, particularly from transport and procurement. Levers: prefer quality local or regional purchases, reduce air freight through prepositioning, reduce packaging, manage waste and plastics, and choose more durable products.

Exercise: safety stock, reorder point and supplier choice

Part 1. A base distributes an average of 250 hygiene kits per week. The main supplier delivers in 6 weeks. Demand varies, and you want to cover 3 extra weeks of consumption. Calculate the safety stock and the reorder point in kits. What happens if a cholera outbreak doubles consumption for 2 months?

Part 2. Annual demand of 12,000 kits, fixed cost of an order (procedure, transport, receipt) of USD 400, storage cost of USD 2.40 per kit per year. Calculate the economic order quantity. Why not apply it as is in a conflict area?

Answer key. Part 1: safety stock = 250 × 3 = 750 kits; reorder point = 250 × 6 + 750 = 2,250 kits. If consumption doubles to 500 kits per week, the reorder point becomes 500 × 6 + 750 = 3,750; an emergency order must be triggered, and a framework agreement or an inter-agency stock loan through the cluster activated. Part 2: EOQ = √(2 × 12,000 × 400 / 2.40) = √4,000,000 = 2,000 kits per order. In a conflict area, access can be cut: higher stock and prepositioning are preferred, because the cost of a stock-out far exceeds the cost of storage.

Key takeaways

- The supply chain is a strategic lever: speed, cost, quality, fraud risk.
- Kraljic: non-critical, leverage, bottleneck, strategic; framework agreements reconcile speed and compliance.
- Reorder point = consumption × lead time + safety stock; EOQ = √(2DS/H).
- Compare offers on total cost of ownership and check the Incoterm: who pays and who carries the risk, and when.
- Every emergency waiver is justified in writing and filed; otherwise the cost becomes ineligible.

Quiz

1. Consumption of 30 units per day, replenishment lead time of 45 days, safety stock of 15 days. The reorder point is:

   A. 1,350 units

   B. 1,800 units

   C. 450 units

   D. 2,250 units

2. D = 8,000 units per year, S = USD 250 per order, H = USD 4 per unit per year. The economic order quantity is:
   A. 500
   B. 1,000
   C. 2,000
   D. 4,000
3. Under the CIF Incoterm, the risk of loss at sea is borne by:
   A. The seller up to the port of destination
   B. The buyer, from loading on board at the port of shipment, even though the seller pays freight and insurance
   C. The insurer only
   D. The freight forwarder
4. According to Kraljic, ready-to-use therapeutic food in a nutrition crisis is rather:
   A. Non-critical
   B. Leverage
   C. Bottleneck
   D. Strategic
5. Offer A: USD 20 FCA + USD 6 freight and insurance + USD 2 clearance, lead time 12 weeks. Offer B: USD 27 DDP, lead time 2 weeks, equivalent quality. What do you conclude?
   A. A is USD 7 cheaper
   B. B costs USD 1 less in total cost and delivers 10 weeks earlier
   C. Both cost exactly the same
   D. Different Incoterms cannot be compared

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