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

Course handout · Week 11 : Measuring performance, controlling costs and reducing the environmental footprint

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.

https://humanitairejobs.org/en/academy/mini-mba-logistique-supply-chain/semaine-11/

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Week 11 : Measuring performance, controlling costs and reducing the environmental footprint

Objectives

- Build a logistics dashboard with indicators that are defined, measurable and useful for decision-making.
- Analyse logistics costs (cost per tonne delivered, share of the budget, hidden costs) and identify real savings.
- Integrate the environment into the supply chain: packaging, energy, transport, waste, and measure the carbon footprint.

Key indicators

A useful logistics dashboard fits on one page and covers each link:

Area	Indicator	Calculation
Procurement	Procurement lead time	Days between the approved request and the purchase order
Procurement	Share of purchases under framework agreements	Value under framework agreements / total value
Suppliers	OTIF	Deliveries on time and in full / deliveries
Transport	Cost per tonne delivered	Transport costs / tonnes delivered
Stocks	Accuracy, turnover, stock-outs	See week 6
Fleet	Availability rate	Days available / days in the period
Distribution	Completion rate	Quantities distributed / quantities planned

Each indicator has a **written definition**, a source, a frequency, a person responsible and a target. Without a definition, figures that do not measure the same thing are compared: does "procurement lead time" start at the request, at approval or at the budget check?

Reading procurement lead time

The average procurement lead time often hides very uneven stages. It is broken down:

Example. Average lead time of 38 days for purchases of 10,000 to 100,000 USD: incomplete request sent back to the programme (6 days), budget check (4), preparation of the file (5), publication and receipt of offers (14), evaluation (3), approval by headquarters (6). The "market" part (14 days) cannot be compressed; the others (24 days) are down to the organisation itself.

Targeted actions: purchase request template with mandatory specifications (−5 days), budget check within 48 hours (−2), delegation of approval to the country up to 100,000 USD (−5). Target lead time: 26 days.

The **median** is often more telling than the average: a few purchases blocked for months push up the average without representing the usual situation.

Logistics costs

Logistics costs include transport, storage, handling, customs clearance, the fleet, logistics staff and losses. They are related to a useful unit:

- **Cost per tonne delivered** (for food and bulk items);
- **Logistics cost as a percentage of the value delivered** (LTSH rate, landside transport, storage and handling, for food assistance);
- **Cost per household served**.

Example. 4,200 t delivered in the year; transport 336,000 USD; storage and handling 126,000; customs clearance 42,000; logistics staff 180,000; losses 21,000. Total 705,000 USD, i.e. 167.9 USD per tonne. If the value of the food is 2,520,000 USD (600 USD/t), logistics costs represent 28% of the value.

This figure is neither good nor bad in itself: it is compared over time, between areas, and with other options (local procurement, cash transfers). A landlocked area will always have a higher cost per tonne.

False economies

Some "savings" prove expensive later:

- Choosing the cheapest transporter without checking its reliability: losses, delays, stock-outs.
- Reducing safety stocks below a reasonable level: stock-outs and emergency purchases at high prices.
- Cutting preventive maintenance: breakdowns, vehicles off the road, accidents.
- Buying lower-quality items: replacements, dissatisfaction, resale by beneficiaries.
- Under-sizing the logistics team: incomplete files and ineligible costs at audit.

Worked example. Poor-quality tarpaulins at 8 USD instead of 12 USD, for 10,000 pieces: apparent saving of 40,000 USD. If 40% have to be replaced after the first rainy season (4,000 × 12 USD + 1.50 USD for transport and distribution = 54,000 USD), the operation costs 14,000 USD more, not counting the families poorly sheltered for weeks.

The environmental footprint

Humanitarian action has a significant environmental footprint: air transport, diesel generators, plastic packaging, waste. The **Climate and Environment Charter for Humanitarian Organizations** (2021), signed by many organisations, commits them to measuring and reducing this footprint.

Logistics levers:

- **Transport**: prefer sea and road to air when the lead time allows (air often emits 50 times more CO_2 per tonne-kilometre than sea); optimise truck loading.
- **Energy**: solar power for offices, warehouses and cold chains; properly sized generators.
- **Packaging**: reduce plastic, favour reusable or recyclable packaging, ask suppliers for lighter packaging.
- **Waste**: management plans, take-back of packaging, appropriate disposal channels.
- **Procurement**: environmental criteria in specifications and evaluation.

Simple emissions calculation. Indicative factors: air about 0.6 kg CO_2 per t·km, road about 0.1, sea about 0.012. 50 t over 6,000 km: air 50 × 6,000 × 0.6 = 180,000 kg (180 t of CO_2); sea 50 × 6,000 × 0.012 = 3,600 kg (3.6 t). The exact factors depend on the sources used; the order of magnitude is enough to decide.

Continuous improvement

A dashboard is only useful if it leads to decisions. A simple cycle:

- **Measure** every month with the same definitions.
- **Analyse** variances against targets and their causes (cause-and-effect diagram, "five whys").
- **Decide** on specific actions, with a person responsible and a date.
- **Check** the following month that the indicator is moving.

"Five whys" example. Chlorine stock-out at water points. Why? The district stock was empty. Why? The order was placed late. Why? The reorder point was not reached in the system because issues were not entered. Why? The storekeeper enters data at the end of the month. Why? No daily access to the tool. Action: data entry at least weekly, offline access, supervisor check. The root cause was not procurement but information.

Exercise: a dashboard that raises the alarm

Situation. Quarter: 120 supplier deliveries, of which 96 on time and 84 on time and in full. Transport: 1,500 t delivered for 198,000 USD (previous quarter: 1,400 t for 168,000 USD). Fleet: 10 vehicles, 90 days, 120 vehicle-days off the road. Distribution: 21,600 kits distributed out of 24,000 planned. 30 t of freight were sent by air over 4,000 km because of a procurement delay, instead of by road (factors: air 0.6, road 0.1 kg CO_2 per t·km).

Tasks. 1) OTIF, cost per tonne and its trend, fleet availability, completion rate. 2) Additional emissions due to air freight. 3) Three priorities for action.

Answer. 1) OTIF = 84 / 120 = 70%. Cost per tonne: 132 USD versus 120 USD (+10%). Availability: (900 − 120) / 900 ≈ 86.7%. Completion: 21,600 / 24,000 = 90%. 2) Air 30 × 4,000 × 0.6 = 72,000 kg; road 30 × 4,000 × 0.1 = 12,000 kg; an additional 60 t of CO_2, not counting the extra financial cost. 3) Suppliers: performance review with the late suppliers, framework agreements with penalties (OTIF at 70%); procurement: reduce the internal delays that forced the use of air freight; fleet: preventive maintenance and analysis of vehicle downtime; transport: analyse the 10% increase in the cost per tonne (fuel, new areas, empty return trips).

Key takeaways

- Each indicator: written definition, source, frequency, person responsible, target.
- Break down procurement lead time: the internal part is often the largest and the easiest to reduce.
- Cost per tonne and the share of logistics costs are compared over time and between options.
- Beware of false economies: quality, reliability and maintenance cost less than their absence.
- Air emits dozens of times more than sea per t·km: planning also means protecting the climate.

Quiz

1. 80 deliveries, of which 60 on time and in full. The OTIF is:
   A. 60%
   B. 80%
   C. 75%
   D. 133%

2. 2,000 t delivered for a logistics cost of 300,000 USD. Cost per tonne:
   A. 150 USD
   B. 600 USD
   C. 1,500 USD
   D. 6.67 USD
3. 8 vehicles over 30 days, 24 vehicle-days off the road. Availability:
   A. 70%
   B. 75%
   C. 80%
   D. 90%
4. 20 t over 5,000 km by air at 0.6 kg CO_2 per t·km emit:
   A. 6 t of CO_2
   B. 60 t of CO_2
   C. 600 t of CO_2
   D. 0.6 t of CO_2
5. Why use the median procurement lead time rather than the average?
   A. It is always lower
   B. It is not distorted by a few purchases blocked for a very long time
   C. Donors require it
   D. It is easier to calculate

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