3. *Organising the Health Logistics Management in emergency*

3.1. Supplying

This is to acquire the resources requested, identify the sources and ways to get them, and make these supplies available to serve the needs on the field.

3.1.1. Type of supplies

The assistance in disaster can be of various types: in-kind, cash, technical aid, human resources, etc. This chapter concentrates on in-kind supplies. According to international agreements, the relief assistance is classified into 10 categories. This division has been successfully applied by organisations like SUMA that deals with supplies management activities, to register humanitarian supplies on the field. These categories are:

- Medicines
- Water and Environmental Health
- Health supplies and equipment
- Food and beverages
- Shelter/housing/electrical/construction
- Logistics/administration
- Personal needs/education
- Human resources
- Agricultural/livestock
- Unsorted

3.1.2. Assessment of the needs

Any request must be done only after determining the real needs expressed by the situation. The assessment of the situation and needs must be done rapidly but extensively. Normally, the type of emergency determines the kind of resources to ask, but there is a group of basic needs related to survival which are always to consider: **health, water, sanitation, food and shelter**.

Information about needs could be gathered from local authorities, UN agencies, international NGOs on the field, field evaluation and contacts (local NGOs, community leaders...), mass media, etc.

Some important information about needs:

- what and how much it is needed? Forecast further needs.
- what can be found locally and what must be brought from abroad?
- can supplies be brought into the country/region? Any specific constraints?

There is no agency capable to solve by itself the whole problematic confronted when a disaster occurs. An interagency co-ordination must be searched in order to complement other agency actions and/or to cover a more extended spectrum of needs. The previous planning and co-ordination principles should be applied.

A disaster scenario can rapidly change because the access to new information, evolution of the situation, and so on. Monitoring the situation would help to adjust our plan to the current needs.

3.1.3. Checking practical issues related to the arrival of supplies

Beside the previous information we had gathered about resources, services and agreements, when a disaster occurs, a checking review must be done in order to determine if they are functional still. For instance:

- availability of arrival points (airports, seaports and borders...)
- transport and warehousing resources
- measures from authorities to facilitate (or restrict...) humanitarian supplies
- agreements with local authorities to facilitate our actions

3.1.4. Procurement sources

A local or external purchase is a decision based in technical and political criteria.

- **Local purchase:** it depends on various criteria, such as the local availability of the product needed, the urgency for this product versus the time to get it from abroad. But in any case, a cost-quality check must be done and it is important to get technical advice. From a political point of view, sometimes a big purchase of a specific product could disrupt the local market or the accessibility of the population to this product. On the other hand, buying locally is a way of supporting the economical recovery of the affected place.

- **International purchase:** buying locally could be a good way to help the economic recovery of the affected country or area, but very often the specific items can not be found locally or the quality/quantity is not good enough to fulfil in a efficient way the needs. In this case, international orders would be the choice. Furthermore, WHO has developed goods and convenient Health Emergency Kits (mainly drugs and medical items) adapted to specific medical needs (see annexe 1)[2]. These have to be ordered as an international purchase. Some other international organisation such as Oxfam and Medicins Sans Frontieres (MSF) has also developed useful kits, including water and sanitation, lighting, emergency health facilities, etc. They are ready to be sent from their headquarters or emergency stockpiles somewhere else in the countries and

[2] See also "*The new emergency health kit*", and "*Kits*" (October 1997) issued by the World Health Organisation. Geneva.

normally has a good delivery time, accordingly with the availability of transport and the accessibility to the affected area.

- **Loans or donations** by private individuals or organisations, and/or other agencies to procure some services, material and/or equipment could be identified or even arranged on the planning phase.

3.1.5. Request/ordering

The clearer and concrete the orders we make, the faster and exact we will receive our request. The misunderstandings could come from everywhere when requesting items, especially on technical issues.

- **Responsible:** only one person clearly identified will be in charge of requesting supplies.

- **Clearness:** the requests must be clearly specified, including all data and details available about the items we are asking for. Once more, technical advice is hardly recommended when ordering, especially on products to which we are not familiarised.

- **Ordering frequency:** it depends on the detected needs, the distribution and stock control. Nevertheless we should not wait to the last moment to issue new orders. Have always on mind the time that takes for a new freight or delivery to arrive.

- **Importation of drugs and dangerous goods:** be aware of the national laws and regulations about entering these products and the procedures to get clearances.

- **Follow up of the order:** orders must be numbered and dated so we can follow them. When asking about an order always mention date and consecutive number.

3.1.6. Incoming freights

When receiving international freights it is always better to hire a forwarding agency to take care of customs clearances and other shipment reception formalities. However, in many cases depending upon the country or the situation, this is not possible. Here are some important things to know:

- All international shipments must be accompanied by the following documents:

  Waybill: this is a kind of acceptance from the carriage company that they have the cargo. It describes the cargo in terms of quantity of parcels, volume, weight and particular information provided about the freight. Waybill is a term for road, train and air carriage, if by ship, will be called bill of lading.

International Cargo Manifest: it describes the freight's details, so we can check what is in the freight without going into the boxes so far. It would be used as confirmation of reception, as well.

Packing list: it identifies the freight contents box by box.

We should receive those documents from the sender prior to the arrival of the cargo. Otherwise, we have to ask for it to be sent as soon as possible because they are necessary for custom's procedures. Some other documents could be included under specific situations, such as the certificate of gift, the quality certificate for food (phytosanitary certificate), the Dangerous Goods certificate, etc.

- On the planning phase we should determine what are the specific procedures of the country, and try to get any special conditions such as exemption from customs duties (normally UN agencies already have), faster way for custom formalities, etc. See also the point 3.2.5.International Transportation.

- Reception: the cargo must be checked from the quality and quantity point of view. Do the contents received correspond to the items ordered and/or the packing list in terms of quality and quantity?. The state of conservation of the parcel and the items must be checked as well. Any difference or problem detected must be communicated to the sender ASAP. The reception of the goods must be reported to the sender, including any remarks about the arrival condition.

3.1.7. Dispatch, outgoing freights:

When sending freight, either national or international, some basic rules must be followed:

- **Preparation:** any parcel belonging to a same freight must be identified with a particular number related to the total amount of parcels (i.e., on a freight of 100 parcels, number 1/100, 2/100, 3/100, 4/100 and so on up to 100/100). This is to facilitate the verification and the follow up of the quantity of parcels at the reception point.

- **Packing and identification of parcels:** every parcel must be clearly identified with the sender's and consignee's name, address and telephone, the consecutive numbering of parcels as mentioned above, as well as any other specific characteristics (fragile, refrigeration required, etc). When packing a delivery, it is important to have in mind the journey and the manipulation that the parcels are going to suffer. Therefore, the resistance of the packing material is very important. Even more, depending upon the type of transport (i.e. plane), we should reduce the added weight as much as possible (the weight of the packing material). One of the parcels must contain the packing list and should be marked as "Packing List". This list is protected into a water-resistant envelope.

- **Size and weight:** as a principle the parcel's weight, size and form should be good enough to be handle for one person (between 25 kg to 50 kg maximum). Very often at the arrival points on the field there are no facilities to unload and handle cargo.

- **Contents:** supplies must be packed separately accordingly with their nature and must be accompanied with a packing list.

- **Waybill, cargo manifesto and packing list:** the carriage company will prepare the waybill and manifesto while we must prepare the packing list describing the contents by parcel. It is expected that this packing list will mention the contents of every parcel.

- **Insurance:** if sending the freight by an authorised carriage company, the insurance may be part of the carriage contract, otherwise we would need to get informed how to insure the cargo (see tables 3 and 4).

- **Dispatching notice:** the reception points must be informed about the dispatch of every single freight, including information such as transport mean (type, company, characteristics, person in charge, etc.), exact destination, arrival point and estimated time of arrival (commonly ETA).

3.1.8. Reception on the field

Follow the same procedures described for incoming freights. The stock keeper must check once more that the arriving items conform properly to the procurement order (request). Any inconsistency must be reported to the sender as soon as possible.

3.1.9. Control and follow up

It is very important to use numbered forms, including as well, the date, name of responsible, information about the mean of transportation, and all the information related and useful to control and follow the deliveries.

3.2. Transport

Is the strategy to bring the supplies to the places where they are needed, taking into account not only the necessary means but also the real possibilities and alternatives for a fast and safe delivery of the assistance.

3.2.1. Availability

A previous inventory of available transport must be done at the planning phase and kept updated, by way of transportation (aerial, sea, river, ground) and type of transport available (trucks, pick up, passengers, all terrain...), etc.

3.2.2. Types of transport and characteristics

They depends on the needs (urgency, size of the cargo...) and the possibilities (transport available, destination, routes condition...). We can mention:

- **Aerial:** faster and reliable shipping option but the most expensive. Used when goods are needed urgently or there is no other means of transportation. It is possible to reach long distances locations. Helicopters: low load capacity but can reach and land in very difficult areas.

- **Road:** very flexible mean. Depends on road conditions and access to the delivery points.

- **Railroad:** could be an interesting alternative in a given situation. It can transport heavy cargoes, but it is restricted to the availability of a railroad and its condition.

- **Sea:** time of delivery could be too long. Delivery of goods can be done only at a sea or river port. Customs procedures could take longer.

- **River:** used when there is no any other option to send the supplies where they are needed. Depending on the size of the river, normally the ships are too small and can not be overload.

- **People and animals:** this would be useful in remote areas or where there is no other possibility for motorised transport. This would be for small cargoes.

Table 1	Ground load carrying capacities (*)
Transport mean	***Load capacity***
Standard train trailer	30 MT (52 m^3)
Standard Container 20 feet/6,1 m	18 MT (30 m^3)
40 feet/12,2 m	26 MT(65 m^3)
Large truck with towing	22 MT
Large truck articulated	30 MT
Medium size truck	6-8 MT
Pick Up Four wheel drive type	1MT
People	
Head or shoulder load	20-35 kg
Back load	35- 70 kg
Pack Animals	
Camel	200-300 kg
Donkey	50- 120 kg
Horse	100-150 kg
Animal Carts (single Animal)	
Donkey	200-400 kg
Horse	up to 1200 kg
Ox	500- 1000 kg

(*) Adapted from *Engineering in emergencies. Davis and Lambert. Intermediate Technology Publication Ltd. 1995, London* and *Handbook for emergencies. UNHCR. 1982, Geneva*

3.2.3. Transport requirements

Type and quantity of transport would be decided depending on:

- Nature and quantity of the cargo to be transported
- Destination: distance, access (air, water, ground), roads condition
- Urgency of the cargo

Is helpful to know for example that because the volume, the WHO Emergency Health Kit takes the whole back platform of a Toyota pick up. By the way, the pre-set kits from UN agencies and international NGOs, have standardised sizes and weight, which facilitates de calculation on needs for transport.

Table 2

Calculation of number of trucks required (*)

Procedure to calculate number of trucks needed:

What tonnage of supplies must be moved? In what period?
What is the turnaround time to move one load to its original location to its destination and for the truck to return? (Do not overestimate speed and include loading and unloading times)
What is the carrying capacity of the trucks?

$$\text{No. of possible trips per truck} = \frac{\text{given period}}{\text{Turnaround time}}$$

$$\text{No. of loads} = \frac{\text{total tonnage}}{\text{Capacity of one truck}}$$

$$\text{No. of trucks} = \frac{\text{No. of loads}}{\text{No. of possible trips/truck}}$$

Allow 25 per cent contingency for vehicle downtime

(*) Extracted from *Engineering in emergencies. Davis and Lambert. Intermediate Technology Publication Ltd. 1995, London.*

3.2.4. Transport strategies (within the country)

Depending on the situation and the needs:

- **Long distance transport:** from the base to the distribution or staging points.
- **Intermediate transport:** this would be useful in cases when transfers. separation of the cargo or partial deliveries need to be done.
- **Local transport:** inside of the operation field (i.e. mobilising supplies locally).

3.2.5. International transportation

International commerce and freights are ruled by a serial of conditions described by the International Commercial Terms, known as Incoterms. Some of the most commons are explained on tables 3 and 4.

Table 3

Explanation of common shipping terms INCOTERMS (*)

Incoterms	Exporters (sellers) liability	Place of delivery	Place of transfer of risk/property from seller
ExW Ex Works	All charges are borne by the buyer, including the cost of preparation and packing for shipping, unless otherwise agreed	At the sellers factory or warehouse	When the seller places goods at the buyers disposal as provided in the contract
FCA Free Carrier	All charges incurred in loading the goods on any means of transport. Buyer is responsible for onward freight charges and insurance	At the agreed place of loading	When delivered into the custody of the carrier at the agreed location
FAS Free Alongside Ship	All charges incurred in delivering the goods alongside the vessel at port of loading. Buyer is responsible for onward freight charges and insurance	Under ships hooks	When the goods are delivered alongside the vessel at the agreed berth and port.
FOB Free On Board	All freight charges, port dues, etc. until the goods are loaded on board the ship. Onward freight costs and insurance are the buyers responsibility	At the ship once safely loaded	Over ships rail at the port loading
CFR Cost and Freight	Freight and other charges to agreed destination port only. Insurance of goods becomes the buyers responsibility	At the named port of discharge upon receipt by the buyer of the Bill of Lading	Over ships rail at the port loading
CPT Carriage Paid To	All charges involved in delivery of the goods to a named destination, excluding insurance	At the agreed destination aboard the transport	Upon delivery by the seller into custody of the first carrier
DES Delivered Ex Ship	All charges to agreed destination port aboard ship. Buyer pays discharge costs and duty	At the named port of discharge aboard ship	On board ship ate agreed port of discharge.
DAF Delivered at Frontier	All charges involved in delivery of the goods to a named point of the frontier including insurance but duty unpaid (lorry or rail)	At the agreed place of delivery at the frontier	At the agreed place of delivery at the frontier
DEQ Delivered ex Quay	All charges to agreed destination port including discharge and duty	At the named port of discharge at the quay or pier	At the named port discharge available to the buyer on the quay or pier
CIF Cost, Insurance, Freight	All charges involved in delivery of the goods to a named destination including marine insurance	At the named port of discharge (or other agreed destination)	Over ships rail at the port of loading
CIP Carriage & Insurance Paid to	Same as DDP but exporter is additionally responsible for insuring goods	At the agreed destination aboard the transport	Upon delivery by the seller into custody of the first carrier
DDU Delivered Duty Unpaid	All charges involved in delivery of the goods to a named destination including insurance less duty	At the agreed destination aboard the transport	At the agreed destination
DDP Delivered Duty Paid	All charges involved in delivery of the goods to a named destination, including insurance	At the agreed destination aboard the transport	At the agreed destination

(*) Extracted from *Handbook for Delegates. International Federation of the Red Cross and Red Crescent Societies*

Table 4

Common shipping terms and buyers/sellers liability

Incoterms	Description	Rail/Lorry loading costs	Rail/Lorry freight	Air/ship loading costs	Air/sea freight	Insurance	Buyer also pays
EXW Ex Works	Goods made available at seller's works	Paid by buyer	Paid by buyer	Paid by buyer	Paid by buyer	Paid by buyer	All onward costs
FCA Free Carrier	Goods made available free on carrier	Paid by seller	Paid by buyer	Paid by buyer	Paid by buyer	Paid by buyer	All onward costs
FAS Free Alongside Ship	Goods made available free Alongside Ship	Paid by seller	Paid by seller	Paid by buyer	Paid by buyer	Paid by buyer	All onward costs
FOB Free On Board	Goods made available once loaded safely on board Alongside	Paid by seller	Paid by seller	Paid by seller	Paid by buyer	Paid by buyer	All onward costs
CFR Cost and Freight	Goods delivery to named destination	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by buyer	All onward costs
CPT Carriage Paid To	Delivered at agreed destination. All charges paid except insurance	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by buyer	All onward costs
DES Delivered Ex Ship	All charges to destination port aboard ship	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Discharge duty & onward costs
DAF Delivered at Frontier	Goods delivered to an agreed frontier point, duty unpaid	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Reloading & onward costs
DEQ Delivered ex Quay	All charges to destination port on the quay	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	All onward costs
CIF Cost, Insurance, Freight	Goods delivery to named destination, marine insurance paid	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	All onward costs
CIP Carriage & Insurance Paid to	Delivery at agreed destination, all charges paid	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Unloading & onward costs
DDU Delivered Duty Unpaid	Delivery at agreed. All charges paid except duty	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Duty, unloading & onward costs
DDP Delivered Duty Paid	Delivered at agreed destination, all charges paid	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Paid by seller	Unloading & onward costs

(*) Extracted from *Handbook for Delegates. International Federation of the Red Cross and Red Crescent Societies*

3.2.6. Loading, unloading and transporting goods

The following are some basic rules that should be taken to ensure a safe arrival of the supplies:

- **When loading a cargo:** heaviest parcels must be placed on the floor and lightest parcels, fragile cargo and weak packed parcels, over the heaviest. In case of intermediate delivery, the parcels being delivered first should be load the last. The cargo should be well distributed on the vehicle's platform in terms of weight. A reliable supervision and counting the parcels must be insured. Never overload the vehicle.

- **Transport and protection of the provision:** cargo should be protected against transport or manipulation damages, from steeling, etc. If the truck is open, the cargo should be covered with awning or plastic sheeting to protect against dust, rain and other agents. The cargo should be immobilised with ropes to avoid it from bouncing, which can damage the cargo or destabilise the truck. For the transport of items requiring refrigeration, such as drugs or medical goods, refers to the point 3.3.5. Cold chain, at the Warehousing chapter.

- **Unloading the cargo:** prepare a convenient site and a working team to unload. The process must be supervised to avoid bad treatment of the cargo that could leads to damages. The parcels must be counted to certify the matching with the documents.

3.2.7. Fleet control

Whenever is possible, it is better to hire contractors rather than managing a fleet, which is normally delicate and complicate. But if we are in charge of a fleet, it must be ensured that it is in good mechanical conditions and the maintenance measures and controls must be established. A proper insurance for civil liability should be ensured, as well.

The use of control forms is recommended such as mechanical services schedules, kilometres, fuel consumption, itinerary, etc. It is important to apply the "one car one driver" policy in order to have a better control of every single vehicle.

3.2.8. Fuel calculation, supplying and controlling

Fuel is one of the most coveted goods, especially at shortage times such as the emergency's periods. A very strict and meticulous control must be applied to follow the fleet fuel consumption, accordingly with it journeys. Every vehicle should have a consumption card. This control must be applied from the beginning of the operation.

In long journeys it is important to identify refuelling points. Transporting fuel together with human consumption supplies should be avoided, but if it is inevitable, the fuel must be separated from the merchandise. Prevent the use of breakable containers.

Table 3

Average vehicle fuel consumption per 100 km (*)

Petrol engines		*Diesel engines*	
Sedan	8-12 litres	2 wheel drive pickup van	10-13 litres
Pick up van	14-17 litres	4 wheel drive pickup van	13-16 litres
Land Cruiser	21-27 litres	Land Cruiser	14-17 litres
Minibus	15-18 litres	Small truck (3.5 to 8 tons)	18-28 litres
		Larger trucks	35-50 litres

(*) Extracted from *Supplies and food handbook. UNHCR*

3.2.9. Transport of dangerous goods

As said before, dangerous goods such as chemical products, must be transported separately from human use products. The compatibility between dangerous goods to be transported together must be checked in order to avoid any chemical reaction during the travel. As a security measure, fuel should not be transported on metallic receptacles, but if it is the case, receptacles should be isolated from metallic walls, from the floor and among itself by wood planks to avoid friction and the danger of a fire. Normally aerial transportation do not allows any fuel cargo and have a several restrictions to transport chemical products.

3.2.10. Organising a convoy and determining routes

- It is better to avoid convoys as much as possible because individual trucks move faster; but in long distances trips or because of security reasons it is possible to organise small groups of trucks. The group should be leaded by a person responsible, capable of maintaining the discipline and taking decisions in case of problems (breaks down, accidents, security incidents...).

- The group of vehicles on a convoy should be kept together and keeping a distance allowing a good visibility to each other. Sometimes would be useful to get a control car at the point and one at the queue of the line of vehicles.

- The choice of routes depends on transport availability, urgency for delivery, delivery timetable (intermediate points?), conditions of the routes, etc.

- Assistance points on the road (food, fuel, mechanic's services, etc.) should be previously identified. Critical points (security wise) should be identified as well (i.e., bad condition stretches, landslide territory, robberies, etc.).

- The staff on the convoy must always carry basic tools to face any difficulties on the route, as well as personal survival items, especially water and food.

- When transporting people (i.e. refugee's evacuation), water, food provisions and other supplies to their protection and well being should be taken along. In this case, would be necessary to arrange medical escort on the convoy.

- Co-ordination for laisser-passer in restricted transit or access areas should be done previously.

Any change or special situation on the road should be communicated immediately to the base (either departure or arrival point).

3.2.11. Security measures for transport operations

- From a security point of view, it is better to travel during the day.

- Frequent checking on mechanical conditions and general maintenance of vehicles being used to transport.

- Security rules and watchwords must be implemented in order to protect the staff and the supplies (staff behaviour, maximal speeds, routing and resting times, check points crossing, relation with military authorities, etc.)

- Determine when an escort for the transports on the operation is needed.

- Transport must have reliable means of communication with departure and destination points.

- Depending upon the situation it must be decided whether the trucks with provision will be identify or not. In some circumstances (war, assaults, looting, etc.) this is not recommended.

- Driver should have a copy of the cargo contents (manifesto) and the official authorisation to transport, so they can be shown to the authorities at any control point on the road.

- Border crossing: previous arrangements should be done with authorities (both countries) for border crossing. Check for any incompatibilities (international conflicts, tensions, enmities, etc...) for the vehicles' staff to drive in on a neighbouring country. People, vehicles and cargoes papers should be in order and available to be shown to the authorities.

3.2.12. Managing a charter operation

This will require a lot of preparation and devoting work and a specifically designated and experienced person should manage it. Even though there are some important things to know:

- **A place to land:** an airport (in the best of the cases) or a place to land must be found. The length, width and general conditions of the runway should be good enough for the hired plane to land. Get all the information about the characteristics of the runway (location, orientation, long, weight, construction material...), ground services (lighting, fuel...), and any other important available information about the landing site, and transmit it to the aircraft contacts. Maybe some repairing or conditioning shall be needed to make it functional.

- **Preparing for arrival:** all details about formalities for clearance to land should be checked with local authorities. It is necessary to determine if ground equipment and support, and/or labour to unload the plane would be needed. Details about present and forecast weather would be important for the aircraft contacts.

- **Date and ETA:** the date and estimated time of arrival (commonly "ETA") must clearly established. It is important to know if the planes would need to refill, which is an extra logistical problem because fuel for aircraft and equipment to pump it is not always locally available.

- **Security for landing:** the flight's responsible (or a designated person) must arrive to the airstrip earlier before the landing to check and clear the runway from people, animals and objects, and to ensure the safety to land.

Table 4

Approximate aircraft load carrying capacities (*)

Aircraft	*Load capacity*	*Airstrip length Requirements*
B747	100 MT/460 m^3	3000 m
DC10/30F	65 MT/340 m^3	3000 m
DC8/63F	44 MT/240 m^3	2300 m
B707/320C	40 MT/165 m^3	2100 m
CL44	26 MT/180 m^3	1900 m
L-100-30 Hercules	21 MT/120m^3	1500 m
DC9/33F and B737/200	14 MT/105 m^3	1700 m
DC3	3 MT/40 m^3	1200 m

(*) Extracted from *Emergency handbook. UNHCR.. 1982, Geneva*

3.3. Warehousing

These are the actions to store and protect the supplies by an organised system until the assistance is delivered, and to foresee the stock endowment for subsequent needs..

3.3.1 Types of warehouse

By its use it is possible to distinguish several types of warehouses. Very often on the field, these types are mainly functions of the same warehouse because the availability of space, the size and length of the emergency operation, etc.

- **General dispatch warehouses:** these are the kind of long-term warehouses or where the items are waiting to be sent to a secondary warehouse for distribution or storage. These can be considered as central warehouses and normally are located at the country capital or regional central points.

- **Stable stocks:** where non-vital or slow turnover items are stored, such as mechanical spares, equipment, reserve items which normally do not have a daily consumption or are not yet allocated.

- **Fast running stocks:** where daily or very often consumption items are stored.

3.3.2. Choosing the site

Very often on emergency situation we do not have many choices of places to store the provisions, and the storage sites may be temporarily constructed out of tents, plastic sheeting, wood and metal sheets, trailer containers, etc. These types of construction are intended to be useful on the initial face of the emergency and should not last too long. In any case, to choose a site we need to keep on mind the following aspects:

- **Type of provision to be stored:** drugs and food need a fresh, ventilated and dry environment; even, some of them would need a controlled temperature. Other items, such as clothes, equipment and material do not necessarily need it. Nevertheless, most of the time the supplies to be stored are of various kind.

- **Convenience of the site:** size, space capacity and possibility to extend the space are conditions to take into account. As a principle, it is always better to have a place bigger than what we really need. The location with respect to distribution places is a concern to have in mind.

- **Internal conditions (structural and non structural):** ideally, the building should be constructed on concrete and to be in good maintenance conditions (at least it does not need a big repairing to be functional). Roof and doors are a must. The building need to have good ventilation, adequate lighting and accessibility for transport.

- **External conditions (topographic and social surrounding):** look for natural risks (i.e. landslides or flooding areas). Stagnating water, dumps, bushes and other environmental deficiencies must be eliminated from the surroundings before using the place. The social surrounding is important to measure up in terms of potential security disturbance.

3.3.3. Organisation and management of the warehouse

- **Warehouse's staff**: Only one person will be responsible for the administration accordingly with the working shifts. A maintenance team to handle the provisions (unloading, moving and loading) inside the warehouse will be needed. A watchman is also desirable. Volunteers from organisations or the community may compose this maintenance team. The modality of food for work may be also applied. Both alternatives help to reduce operational costs, but they are not trouble-free related to security and staff instability. In any case, the administrator must be paid because the nature of his functions and responsibilities.

- **Equipment and material for the warehouse:**

  Indispensable: water, electricity or generator, pallets, tools to open and seal boxes, first aid kits, extinguishers type ABC, stationary and forms to keep records, cleaning material and products, locks on the door…

  Desirable: packing labels, adhesive tape, scales, load lifters, carry-on carts, forklifts, weight and measures conversion table, metric label, staircase, refrigeration devices, shelves…

- **Basic rules for the warehouse:**

  The space use for the allocation of the diverse goods in the warehouse should be planned before the arrival of the consignments.

  Never mix products from different nature in the same pile, pallet or lot.

  Chemical, flammable or other dangerous products must be stored on a different warehouse or as far as possible from human consumption products.

- **Pilling up the products:**

  Floor must be clean and dry before pilling up the provisions.

  To avoid moisture and other inconveniences, products should not be on direct contact with the floor, the roof or the walls. Pallets should be used to pill up the stacks. Supplies must be together accordingly with their nature.

  The height of the piles should take into account the packing material resistance (or the storing instructions on the boxes if there are). Normally not higher than 2.5 m

  The location, height and distance between piles must allow the natural lighting from windows to come inside.

  Distance between piles is about 0,70 to 1 m to allow the movement of people on maintenance or control tasks. If there are handling cargo machines (load lifters, forklifts), the space between piles should be enough to permit it movements. Free air circulation should be ensured as well.

  Every stack must be clearly identified with the name of the kind of goods containing.

- **Movement areas and sectors in the warehouse**

  To make it wiser and practical, some movement areas and specific identified sectors are recommended inside the warehouse:

  Arrivals area: to handle the provision incoming (unpacking parcels, checking contents, sorting, selecting, etc.) before to store.

  Delivery area: to locate provisions ready to dispatch. These provisions should be pilled up on separated pallets and labelled by destination.

  Storing area: where the stock material and/or provisions without current destination are stored. This area is divided accordingly with the type of supply (food, clothes and household goods, medical products, etc.).

  Packing sector: it is a working place to prepare deliveries. Empty boxes and carton to be reused are located in this sector as well.

  Administration sector: it could be a single desk and a file holder (with lock) to manage the administrative tasks.

- **Reception and dispatching procedures**

  Reception and dispatching areas in the warehouse should be clearly defined as mentioned above.

  Procedures and tools for reception and dispatching of supplies must be clearly established (authorisation forms, receipts...) and verified that they are understood for the person in charge. It is especially important to clearly point out the person authorised to release any supplies from the storage.

  Every cargo entering on the warehouse must be counted and inspected in terms of quantity and quality. Contents may match with the documents beside. Once the verification of the incoming supplies is done, these should be registered immediately to the stock inventory.

  When receiving food (i.e. cereals, powder milk, sugar...) the checking should be also leaded to determine the state of conservancy and whether any treatment would be needed. If any infestation is detected on incoming products, these must not be stored together with the products in good condition. Only a trained person must do treatment.

  Products on deteriorated or broken packing should be repacked and/or distribute as soon as possible if the damage does not represent a danger for human consumption.

  Stock rotation is made out the principle "first in, first out": products that came in first are delivered before than the products just arrived. Products with nearest expiring date should be located in front to ensure their first departure and fresh entering products will be located behind, waiting for it turn. In equal expiring date, products with longer stay on the warehouse goes first. Products with damaged packing should be delivered as soon as possible, whenever there is no a health danger to the population.

- **Controlling and monitoring stock**

  A clear system to register and control the incoming, outgoing and stock supplies must be established. Some actions to help the control and monitoring are:

  Every single cargo must be registered since its arrival to the warehouse. A written record of entries must be always available for control.

  Each type of good is controlled by a "store card" kept by the storekeeper, that should match with the "stack record card", which is stuck to the respective pile or stack. Both of them reflect the movements of every particular good, and should match with the official issuing authorisations.

Date of entry of goods to the warehouse and expiring dates needs a very careful control. This may appear both in the stack record card and in the store card.

Perform physical inventories regularly to keep up dated stock cards and printed inventory.

Storekeepers must prepare a weekly report of activities, including the latest inventory.

Clear and updated register and control of losses and destruction or disposal certificates (expired and deteriorated products). The disposal or destruction of damaged goods should be only under official written authorisation.

Forms specifically designed must be used to record all movements of supplies in the warehouse (request, incoming and deliveries). Every form must have consecutive numbers, date, name of the persons involved (senders, transport, recipients...) and other information intended to track the supplies.

3.3.4. Determining size and store capacities

The size is always depending of the amount of the consignments expected, but as said before, it is always better to have a bigger place rather than a just or smaller place. Normally, from the total space available, 70% will be used to store and a 30% as working space (passage, packing, access...).

Table 5

Determining of warehouse capacity needs (*)

Must know	***Examples***
Population to be served	Expected influx of 30,000 persons
Proposed distribution	One tent per family (average of 6 persons per family)
Frequency of distribution	On time only
Period of required supply	3 months
Weight / Unit volume of goods	1MT = 25 tents = 5m3
Reserve supply	10%

Calculations

Quantity of tents to be store = $\frac{30{,}000}{6}$ x 5,000 + 10% = 5,500 tents

Volume of tents = $\frac{5{,}500}{25}$ x 5 m^3 = 1,100 m^3

At a height of 2 metres, floor area required = $\frac{1{,}100m3}{2m}$ = 550m^2

Check floor loading = $\frac{5{,}500 \text{ tents}}{25 \text{ tents/MT}}$ = 220MT

$\frac{220MT}{550\ m2}$ = 0.4MT or 400 kg/m^2 (acceptable)

Allocate 550m2 + 20% for access and ventilation = 660 m^2 of floor space

(*) Extracted from *Supplies and Food Aid Field Handbook. UNHCR. Geneva, June 1989*

3.3.5. Cold chain

Some drugs and medical products need specific stable and controlled temperature conditions. To store this kind of goods it would be necessary to have the appropriate refrigeration equipment and a reliable source of energy to keep it running during power cuts. Normally these equipment works with batteries needing some surveillance (recharging or maintenance), so one person must be designed to do it. The ideal temperature of these products must be kept even (and specially) during it transportation. In order to do this they must be transported inside of cool boxes cooled by plastic containers with frozen water that fits into these cool boxes. Therefore, it is needed to ensure the availability of these tools as well. Nevertheless.

take notice that the chilling action does not remain forever, so the transport/delivery timing is very important at this respect.

3.3.6. Maintenance and hygienic measures

Maintenance: regular inspection in the building conditions should be done, especially for electrical installations, ceiling and roof and the general physical structure. Any repair must be done as soon as possible to avoid small damages become bigger.

Hygienic: the surroundings must be kept on good cleanness condition and free of dumping, stagnant water, bushes and any other elements that lead to the proliferation of insects or rodents. A cleaning plan of the warehouse must be designed, including daily cleaning and a periodical general cleaning of the whole facility, inspection of the stacks of goods, corners and sectors of the building. The main measure to avoid infestation is to prevent it. No animals should be allowed to enter in the warehouse. Accumulating waste disposal or materials without control should be avoided. Do not mix any food suspected of infestation with other food products. Spraying and chemical measures in the warehouse are common practices to fight against pests, but trained staff must carry out these duties.

3.3.7. Security and safety measures

- Only the staff in charge should have free access to the warehouse's facility.
- Day and night watchmen should be displayed.
- Regular checking of the conditions of gates and doors locks.
- All the staff should be aware about hazards and safety measures to avoid accidents, and should know how to use the different protection devices.
- Marks and signs advising hazards should be visibly displayed.
- Warehouse is a non-smoking site.
- Use of back/waist protection and gloves for heavy duties, as well as any other protection equipment and tools for the workers.
- Fire extinguishers and first aid kit should be visibly located on an area always clear of obstacles.

3.3.8. Storing of dangerous goods

They should be stored in a different place rather than in the general warehouse. Law, norms and procedures for manipulation and storing dangerous goods must be checked to minimise hazards.

3.3.9. Temporary emergency warehouse

If there is not an appropriate structure to install the warehouse (i.e. displaced-refugees camp), it is possible to build a temporary warehouse either with hard material (wood, metallic sheets) or plastic sheeting (type MSF-OXFAM). In any case, the same conditions in terms of location and convenience must be taken into account to choose the site.

3.3.10. Staging areas

In some cases the situation in the affected country or region may not allow the direct arrival of the supplies and a "staging area" should be needed. This is a temporary or transit storage in a neighbouring country or region.

3.3.11. Emergency stockpiles

Some UN and other international relief organisations maintain stockpiles in different regions of the world, containing supplies to be used when a disaster occurs in any neighbouring country. The WHO pre-set health kits (mainly drugs and medical items) are stored at the OCHA (Office for Co-ordination of Humanitarian Assistance) stockpile in Pisa, Italy. This is a general stockpile and not only emergency items. Detailed features of the emergency health kits can be found as Annexe 1 of these guidelines.

Keeping an emergency stockpile obeys to several criteria such as increasing the time's response capacity to deliver relief provisions on a sudden disaster situation or unavailability or difficulties for an immediate delivery of certain relief items in a given region.

The items stored at these stockpiles are mostly equipment, non-perishable or long lasting items. Drugs and health equipment is often stored, but a strict control on expiring dates and stock rotation must be observed. Pro and cons about such stockpiles are always in discussion: i.e. having all that material sitting on a warehouse, waiting for a probable disaster one day, somewhere, is a critic to the emergency stockpiles. But according to it defenders, the advantage is that basic material they need to face the impact of a sudden emergency is at hand, ready to use and do not need to wait for days or perhaps weeks to start helping. In any case. emergency stockpiles are quite useful if:

- they are meant to serve on a regional basis, and not only to the country where they are based;

- they are open to provide with goods to other organisations and not only to the owner;

- they are based on a safe and appropriate location, in terms of the disaster risks found at the base country and they have the capacity to reach affected countries from the storing site.

3.4. Distribution

Is the main objective of the whole Health Logistics Management and is intended to bring the assistance to the people affected, through a proportional and controlled delivery to avoid abuses and waste.

3.4.1. Basic Principles

Distribution should not be a generalised and indiscriminate action. The entire contrary is proportional and controlled to avoid abuses and wastes. Some basic principles that should lead the distribution activities are:

- It is pertinent to the needs and appropriate to the cultural and environmental context.
- Only products and items strictly necessaries to cover basic needs for survival or improving basic life conditions should be distributed.
- Given only to the population that really needs it, proportionally to their need.
- It is complementary and is not intended to solve ALL the needs of the population but the most urgent and vital.
- This assistance is intended to help the affected population on basic and vitals needs on a situation of sudden and temporary break down on their capacity of provision. Therefore must be immediate to cover critical moments of need, but...
- it is temporary to avoid the long-term assistance that could generate dependence from external aid and does not stimulate the economic recuperation of the affected area. This is different in cases of long term displaced, such as war refugees, but even in these cases, the self-sufficiency activities should be supported.

3.4.2. Responsibility and criteria

Decision-makers and distribution criteria on aid distribution must be clearly defined. It would be critically important to determine if our organisation is able to face a distribution operation; if so, would be necessary to find out how the beneficiaries would be chosen, what procedures would be applied for the distributions, etc.

During scarcity situations in certain political and/or military contexts, the provisions become a source of power and control for the groups having better access to them. Politicians often try to control distributions of relief supplies to push up their public image. Therefore, the equity in distribution and the safekeeping of provisions are fundamental to avoid it to become a doubled-edge sword because distortion and mismanagement.

3.4.3. Distribution systems

Distribution systems are different accordingly with the given situation (i.e. access to the affected population), the particular conditions of the population (i.e. displaced-refugees, damaged population not displaced...) and the real capacities of our organisation to take direct care of the distribution. So it could be:

- **Direct distribution:** given directly to beneficiaries. A good knowledge of the social and physical environment of the affected population and a very good logistical capacity and infrastructure are needed. This allows direct control of donations but it is extremely hard to manage it without trained and experienced staff and a steady presence on the field.

- **Non direct distribution:** given to intermediaries such as governmental or community's organisation, NGOs, social institutions, etc. It is easier and faster, but the management of supplies and final destination of the donations must be well monitored to ensure a proper delivery to the affected population. This also reduces "visibility", which is often important to some organisations toward their donors and financial sponsors.

The choice of any of these two systems must be informed to the donors in order to keep them up to date.

3.4.4. Partners on distribution

When working in an unknown place is very difficult for a non-local organisation not to be deceived or even to make a convenient and fair distribution. In these circumstances, finding a reliable local partner who knows the population, the place and the situation is a must. Groups like local NGOs, settler's organisations, local Red Cross and relief organisations can be taken into consideration as partners on distribution. Even though, this decision will be taken accordingly with the given situation.

3.4.5. Controlling and monitoring in distribution:

- **Direct distribution:** a system that includes registration lists, tickets, ID of beneficiaries, receipts signed by beneficiaries and census of population should be developed to control the delivery of assistance. This is very difficult specially in the case of moving population, in crowds or huge quantities of persons to be assisted.

- **Non direct distribution:** on-the-field verification must be given to ensure that our partners on the field are making appropriate, proportional and fair distribution to the affected population. A control by documents and physical verification of the goods delivered and remaining must be done on a regular basis with a proper registration procedure.