

2.3 Building a stock strategy

2.3.1 Assessing the warehouse requirement (number, location and operation):

During the *design phase* of a programme, a **stock strategy** should be developed, including the potential requirements for warehousing. This should fit into the wider **supply chain strategy** for the programme (see **supply chain strategy template** and guidelines).

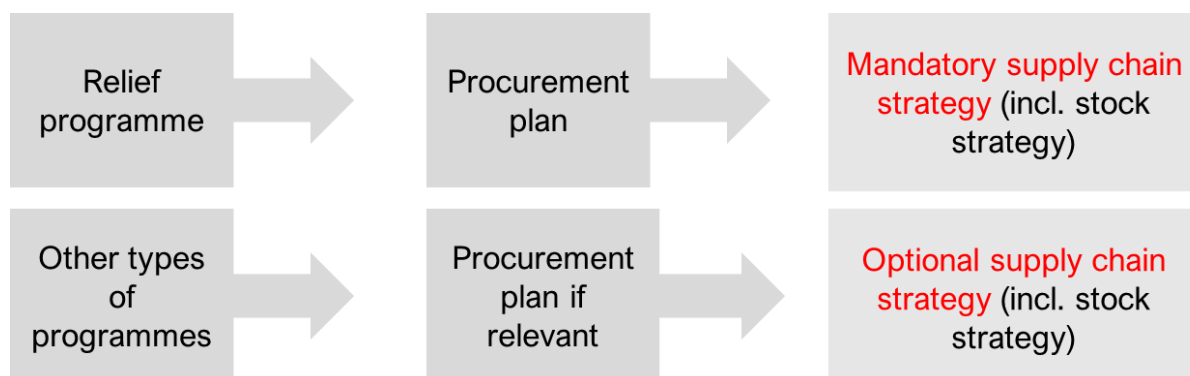
Warehouses are required when the time required to purchase and mobilise relief items is expected to be lengthy or when responding to a protracted crisis where the risk of disruption on the supply chain is high.

A network of warehouses may also be required to ensure the rapid and efficient delivery of relief supplies. Since most BRC programmes are short-term (a maximum of several years) the need for a permanent warehouse is rarely justified, although it can be considered as a long-term solution for an HNS supporting future programmes.

Stock strategies must be in line with organisational strategies because holding stock with a projected high value is a risk to the organisation. Other supply chain options, such as the delivery of goods taking place closer to the required time, are sometimes preferable.

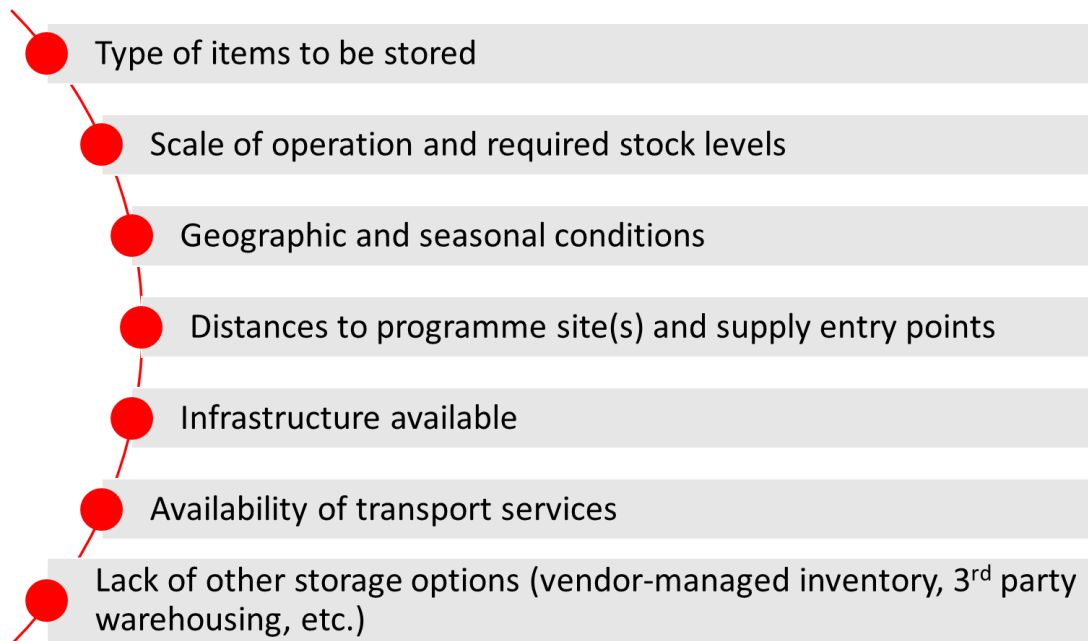
However, holding stock cannot always be avoided, especially in the context of an emergency where supply lines might be disrupted, local markets disturbed and needs fluctuating.

Programmes should not be built around the stock strategy (*What do we have?*) but a stock strategy around the programme (*What do we need?*).



It is a requirement to develop stock and supply chain strategies for any programme that has a relief component (e.g., the distribution of goods and/or a construction component where the construction will not be subcontracted). Other programmes that include one-off supply activities (e.g., vehicles, equipment, tools, etc) require a **procurement plan** but not necessarily a stock or supply chain strategy.

2.3.2 Quantity and location of warehouse(s)



→ **Number and location of warehouses required for an operation**

2.3.3 Stock strategy definition

Link to [stock strategy definition](#) diagram.

During the *planning phase*, the programme team should provide the following information to enable logistics to develop a stock strategy.

2.3.3.1 What?

Storage requirements vary depending on type of items: NFI and food items can usually be stored in bulk and do not require specific storage or handling practices, beyond being stored separately from chemicals and other dangerous goods.

Some items require special attention in terms of the type and security of storage they require. Specific attention is required when storing and handling these items.

Medical supplies and drug shipments can contain small and high value items, many of which have a limited shelf-life. A secure area is required, and close attention must be paid to expiry dates.

Antibiotics and vaccines require temperature-controlled cold storage arrangements, with sufficient capacity and a reliable power source, with a back-up option.

Non Food Items (NFIs) can usually be stored in bulk with no specific storage or handling limitations

Combustible items, such as alcohol and ether, must be stored separately, preferably in a cool, secure shed in the compound and outside the main warehouse.

Dangerous goods such as fuels, compressed gases, insecticides and other flammable, toxic or corrosive substances, are hazardous.

International regulations require special markings to identify their dangers.

Consider the volumes to be stored: the quantity to be stored and the frequency and size of deliveries and despatches will influence the stock strategy definition.

Will the stock strategy involve holding kits in stock? How much kitting activity is expected to take place in the warehouse? Kits are often used in emergencies, when the aim is to provide large quantities of a standard set of items to large numbers of people. The IFRC standard product catalogue (SPC) includes a wider variety of kits, normally provided as full kits by long-term suppliers sourced by the IFRC (<https://www.ifrc.org/en/what-we-do/logistics/procurement/catalogue-/>).

Handling hazardous substances:

- Inform warehouse personnel of the specific hazards associated with the dangerous goods in store and provide personal protection equipment (PPE), training and regular practice on how to deal with accidents and spills.
- Post clear instructions, in the local language, on how to deal with hazardous substances and spills, including who should be notified.
- Follow instructions on package labels carefully.
- Stack hazardous materials with care, prominently posting signs that display their dangers to all who have access to the storage area.
- Store flammable substances separately and away from the warehouse building.
- Do not permit smoking, cooking or open flames of any kind within ten metres of the storage areas. Ensure that fire extinguishers and sand buckets are nearby.
- Substances which vaporise easily, whether flammable or toxic, must be kept cool.
- Store chemicals such as fertilisers, pesticides or cement separately from other items, and never store them in a warehouse where foodstuffs are located.
- Always comply with local regulations when storing hazardous materials.

Managing kits:

- Kits and their content used by any Movement partner should always match IFRC or ICRC specifications, although other UN standards might be used in exceptions. Non-standard kits may have to be developed for specific operations, with items procured and delivered as

loose stock and kitted in the warehouse before despatch and delivery. Standard kits may also be used, with slightly modified contents to cater for specific needs.

- Variations from standard kits must always be discussed and agreed with the programme team so they match the technical requirements and so all kits, and their content are exactly identical.
- A cost analysis is required to determine if the kits should be assembled by the NS or by the supplier. If it is decided that the NS or other partners will cover the kitting activities, this should be taken into consideration when designing the warehouse and its space and health and safety requirements.
- Throughout the supply chain, it is important that a kit is always considered as a single item (one unit) that cannot be separated. Items included in a kit cannot be requested as separate units.
- Where the kit contains one or more perishable items, the whole kit expires as soon as a single unit reaches its expiry date. This is often the case for medical kits; a medical kit containing a single expired item should be placed in quarantine until the expired item is replaced.
- If kits are assembled inside the warehouse, it is recommended that a requisition form is used specifically for the assembly of kits, as the kit is built from pre-existing loose stock.
- Only complete kits can be returned; otherwise they should be received in stock as loose items.
- Where kits are complex (more than 15 items, high-value, varying expiry dates, medical kits or assembled in the warehouse), it is recommended to use a **kit preparedness tracker** (easily developed in Excel) to manage them and communicate clearly on the capacity to deploy them. The tracker also helps to support the kit replenishment process.

2.3.3.2 Where?

- Where is the programme being implemented, and where are the goods required?
 - Geographical location (is access by road, sea or air?)
 - Rural or urban area
 - Number and location of sites
 - Security situation
- What warehouses are available, in the region and country, in and outside of the Movement, and what are their associated costs?
- What are the options and costs of renting commercial warehousing?
- What are the options and costs of using temporary Rubb Halls (mobile storage units, or MSUs) or containers (a last resort, due to cost, storage conditions and their difficulty to manage)?

Gathering this information will allow for a decision on where along the supply chain to position the warehousing (at global, regional, local or field level).

Consider the option and cost of having Vendor-Controlled Inventory (VCI). Where there are long-term relationships with suppliers, suppliers can hold stock for the RCRC in their own warehouses. The stock is prepaid by the RCRC and released with a simple stock request. In this case, requirements need to be carefully calculated and transport costs closely estimated as they are likely to be higher. A VCI strategy is viable where the variety of items required is small and can be supplied by a maximum of two or three suppliers, who are willing to collaborate and consolidate shipments to control transport costs.

2.3.3.3 When?

A detailed timeline (start and finish dates for the programme), with requirements throughout the programme's implementation.

Details of the frequency of deliveries and despatches will also be helpful here.

2.3.3.4 How?

Design the reception, requesting, despatch and reporting processes at an early stage of the programme design, to inform the level of human, financial and administrative resources required.

Questions to ask when defining a warehouse resourcing strategy:

- How will deliveries be managed? Who will process them and how will they be documented?
- How will requests from users be managed? When will they be received by the warehouse team and how will they be documented? Who will prepare the orders – in what timeframe, at what frequency, with deliveries done where (at the warehouse door or at the site?)?
- How will despatch operations be managed? Who will oversee the booking of transport, how will transport be booked, how will despatch be documented, who will validate despatch and how will delivery rounds be organised?
- How will stock reporting be compiled and communicated? What information will be recorded and what will the reporting cycle be (weekly, bi-monthly or monthly)?

2.3.3.5 How much?

Some factors you need to consider when setting the stock minimum:

- Total population in the area
- Total population at risk in case of disaster
- The kind of disasters that might occur
- The probability of disasters happening
- The kind of items needed
- Replenishment time = the time it would take to get relief items from HQ or other partners to your area
- The response capacity of the branch (number of active volunteers trained in emergency response and/or logistics)
- Available storage space
- Available transportation means...

The setting of minimum stock levels must be discussed between the logistics and programme teams.

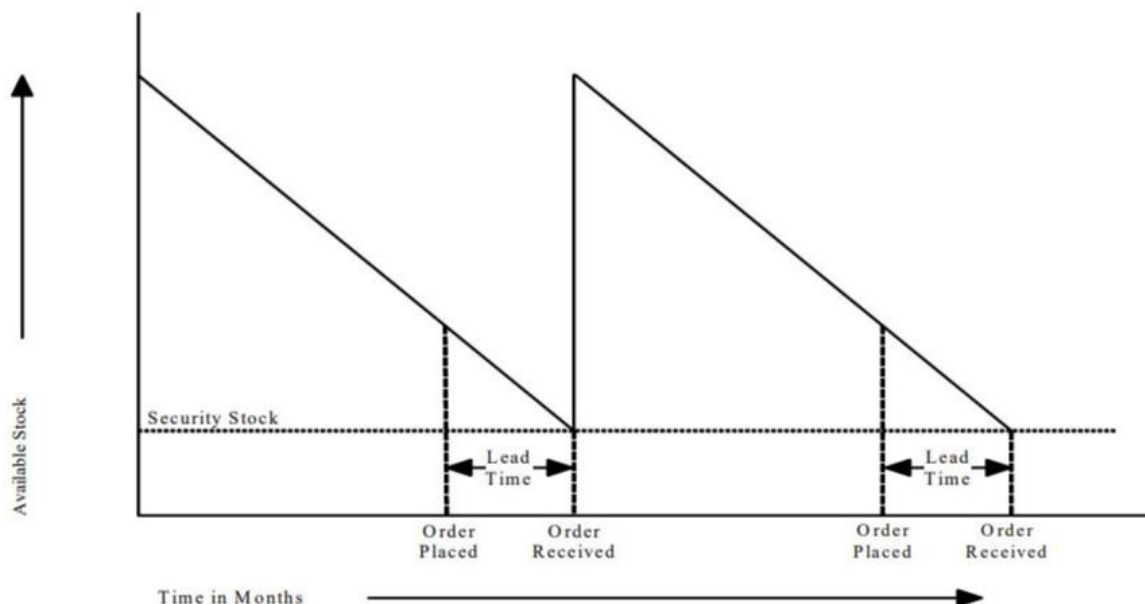
The Logistics team should make a recommendation based on the programme's requirements, to be assessed by the programme team in view of objectives, budgets and timeline.

There are a set of criteria that support defining the ideal inventory level. Usually these include:

- The budget available for warehousing and transportation costs. Limited resources will influence what type of warehouse activities the programme can afford, in terms of storage space, transportation possibilities and human resources.
- Clarifying the different purposes of the inventory:

	Working stock	Safety stock	Preparedness stock
Purpose	To meet normal or expected demand for humanitarian goods between deliveries.	To mitigate the risk of stock-outs in the period between deliveries (due to increased demand or decreased supply).	To meet sudden increases in demand.
Depends on	Level of demand	Unpredictability of demand	Organisational policy
	Order frequency	Unpredictability of supply	Availability of funds and resources to manage
	Vehicle spare parts, fuel	Risk appetite	Household items

- Understanding the stock-time curve: this is about managing the supply and demand. The usage rate of stock can vary and it is important to identify and record times when the safety stock is used. See the below diagram that illustrates the stock-time curve.



- Using forecasts. Estimating demand and supply capacity will support the accurate definition of order quantity and frequency. Forecasts will be based on the organisation's strategy (how they define preparedness requirements in the stock strategy paper), assessment reports (how they define working stock levels in assessment reports) and short-term forecasts and risk assessments (how they define safety stock levels in the programme plan).
- Choosing an ordering system – choose the trigger for placing a replenishment order. Apart from the stock level and the usage rate, two factors can determine what is the right time to place an order:
 - Order placement and delivery lead time
 - Order quantity
- Considering the shelf life of items held in stock in the ordering cycle.

To determine the order frequency and quantity, the free stock level is the most important information to have at hand.

$$\begin{aligned}
 & \textit{physical stock on hand} \\
 & + \textit{stock on order from suppliers} \\
 & \quad + \textit{stock in transit} \\
 & \quad - \textit{reserved stock} \\
 & = \textit{Free stock level}
 \end{aligned}$$

Reserved stock is stock already allocated to orders in preparation, or stock otherwise reserved for special purposes.

There are two different “standard” re-ordering systems:

Two-bin system

- Best used for low-value items
- Stock is kept in two separate bins (50 per cent in each bin).
- When Bin One is empty, start picking into Bin Two and replenish quantity for Bin One and Bin Two.

Periodic review system

- Define review period, depending on stock movement frequency.
- Best used for High usage, “critical” items
- Weekly/monthly review of free stock quantity.
- Replenishment system options:
 - *Top-up system*: at each review, place an order to top up from available stock to a target stock (agreed with stock owners)
 - *Minimum stock system*: place order when free stock is less than minimum stock (a “re-order point”). Bear in mind that other factors can impact the order quantity, such as the minimum order quantity set by suppliers or the available budget.

Remember

$$\textit{Reorder quantity (ROQ)} = \textit{average daily usage} \times \textit{average delivery lead time}$$

$$\textit{Reorder point (ROP)} = \textit{ROQ} + \textit{safety stock}$$

When ROP is reached, an order should be placed to the ROQ quantity calculated.

Safety stock must be an organisational decision (expressed in days’, weeks’ and months’ usage), based on risk appetite.

ROQ should be calculated with daily, weekly and monthly numbers consistently across the calculation. This calculation takes consumption during both the order lead time and consumption in general into account but variations (higher or lower consumptions) will not be incorporated.

A concrete example

➔ The initial situation:

- In Sinapai branch, they decided to stock at least 50 family kits (= 50 lanterns, 50 buckets, 50 jerry cans, 150 blankets, ...).
- Their actual stock is 60 complete family kits.

➔ The distribution:

- After a small disaster, the branch distributed 10 family kits with 15 extra jerry cans and 10 extra blankets.

➔ The new situation:

- They only have 35 complete family kits left.

➔ Replenishment needs:

- They absolutely need to replenish 15 jerry cans and 10 blankets to reach their stock minimum of 50 complete family kits.

General considerations for stock strategy definition

- Are there other programmes planned (by BRC or another NS) with similar activities that could potentially fit into one stock strategy? If yes, ensure strategies are aligned and well embedded.
- If stock strategy poses too high a risk or does not provide VFM, can alternative modalities be considered? Think of vendor-controlled inventory, or stock managed by partners.
- Are there any previous experiences with this HNS or context we can draw from? Consult with other programme managers.
- How does the stock strategy support development of the capacities of the HNS? How is it aligned with its strategic objectives?
- Logistics can advise ordering extra items for safety, but this must always be agreed with the budget holder (or programme manager) before placing the order.

2.3.4 Estimating your storage space needs

Once it is confirmed that one or several warehouses will be needed to deliver the objectives of the programme and with the storage location(s) agreed, you will need to estimate the storage needs.

The size and type of the warehouse will depend on the required storage capacity for an operation and is determined by the maximum quantity (in tonnage and volume) of supplies to be stored there.

This may be different from the total quantity required for the whole operation. The quantity of stock to be held and the number of warehouses to use will vary along the duration of the programme and is determined by the programme plan.

The required storage volume depends on the weight-per-volume ratio of the goods. The area occupied by one item depends on its volume, the height of the storage space and the maximum permissible load-per-square-metre of floor space.

To illustrate how volumes can vary dramatically, below are some examples of the average volume in cubic metres of one tonne of the following items:

Items	1 MT (1 metric ton = 1000kg)
Grain, flour, sugar (bagged)	2m ³
Medicines (average for bulk shipments and medical kits)	3m ³
Vegetable oil (in drums or tins)	1.5–2m ³
Blankets in pressed bales (approximately 700)	4–5m ³
Blankets in un-pressed bales	8–10m ³
Clothes (in bales)	7–10m ³
Tents (approximately 25 family tents)	4–5m ³
Kitchen utensils (in 35–40kg boxes)	4.5m ³

When calculating storage requirements, only 70 percent of the total warehouse's surface capacity should be considered as available for storage space. The remaining 30 percent is used to ensure proper ventilation, passageways, handling space and repackaging areas.

Warehouse's storage capacity

Approximate storage capacity of the warehouse = Length x width x (height – 1m) x 70%

How to calculate the required storage capacity:

- Add the total weight and total volume of the items to be stored and use the volumetric info from the above table (CBM per MT requirements)
- Divide the total CBM by 70 and multiply by 100 to calculate the total warehouse volume needed. Assume 2m stacking capacity. Include truck docking areas (in addition to the storage spaces).

item	packaging type	A/C	stock levels	stock levels	stock level	space required per MT in M3	cubic requirement	area in sqm required for optimum stacks at 2m high	total area needed (incl 30%)
		unit	pc	kgs	MT				
Rice 5% broken	Bags	kg	639,000.00	639,000.00	639.00	1.50	958.50	479.25	623.03
Beans red kidney	Bags	kg	262,312.00	262,312.00	262.31	2.00	524.62	262.31	341.01
Vegetable oil	Tin	litre	82,214.00	82,214.00	82.21	1.70	139.76	69.88	90.85
Wheat soya blend	Bags	kg	83,042.00	83,042.00	83.04	2.00	166.08	83.04	107.95
Sugar white	Bags	kg	7,071.00	7,071.00	7.07	1.50	10.61	5.30	6.89
Iodised salt	Bags	kg	2,357.00	2,357.00	2.36	1.50	3.54	1.77	2.30
Family tents	Piece	piece	213.00	18,105.00	18.11	5.00	90.53	45.26	58.84
Kitchen set	Box	piece	512.00	2,560.00	2.56	4.50	11.52	5.76	7.49
Blankets 50%	Bundle	piece	1,230.00	61,500.00	61.50	10.00	615.00	307.50	399.75
grand total sqm									1,638

2.3.5 Estimating your floor-load capacity needs

No more weight than that specified in the warehouse leasing contract should be stacked per square metre of floor space. The permissible load at ground-floor level will normally be 1,000–3,000kg/m², but on upper floors (or ground floors where there is a crawlspace or basement) it can be as low as 500–800kg/m².

Always do a physical check of the floors – when they are in good condition, standard capacity calculation will be good enough, but when floors are damaged, their capacity will be reduced.

Floor capacity calculation, rice bags

1 bag = 50 kgs

1 storage layer = 5 x 10 bags
= 50 bags
= 2500 kgs

A 14-layer stack = 14 x 50 bags
= 700 bags
= 35 tons

Each layer is 5m x 5m = 25 sqm

Minimum required floor-load per sqm for storing the rice bags:
= 35 tons/25sqm
→ = **1.4 ton/sqm**

2.3.6 Calculating stock turnover and adjusting target stocks

It is good practice to periodically review the target levels of stock that have been set for a programme and set a stock turnover target (per item and per period) to ensure that the stock targets remain relevant to the operation.

The stock turnover target can vary from one item to another and depends on the context of the operation.

At the BRC, the stock turnover target on NFI stocks pre-positioned for emergency response is equal or greater than two per year: to consider stocks as relevant, the ratio of items issued out to the average inventory level in the year must be greater than two.

A basic way to calculate the average inventory is the beginning-of-year inventory plus the end-of-year inventory, divided by two.

$$\text{average inventory} = \frac{(\text{inventory at beginning of year}) + (\text{inventory at end of year})}{2}$$

A few questions to guide the stock review:

- Of the total stock, how much has been used (requested or issued stock divided by total stock, in percent) over the period observed?
- What is the total percentage of stock loss (expired, damaged, and lost stock divided by total stock, in per cent)?
- What is the ratio of used storage area vs available storage area in the warehouse?
- What are the objectives of the programme the stock serves?
- What are the relationships of the NS with established suppliers in the area? Could they provide VCI or respond to needs within a maximum of 48 hours?