
UNIT 11 TEMPORARY SHELTER, WAREHOUSING AND STOCKPILING

Structure

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11.0 LEARNING OUTCOME

After studying this Unit, you should be able to:

- Examine the concerns and issues related to temporary shelter and discuss the importance of community partnership while building shelters; and
- Analyse various types of measures that are required to be taken for maintaining effective and efficient warehousing and stockpiling facilities during disaster and non-disaster times.

11.1 INTRODUCTION

Disaster preparedness involves arranging for logistics and supply of essential commodities during times of crises. Temporary shelter provision is necessary to evacuate people to safe sites from disaster ravaged areas. Essential items include medical supplies apart from food and clothing, as disease outbreaks are very probable in the aftermath of disasters. Apart from physical illnesses that result from diseases like dengue, cholera, dysentery, respiratory infections and malaria, as these have been found to be most common, psychological shock also has to be dealt with. Shelter provision is both a response and a mitigation effort. For example, after the Orissa super cyclone, it was realised that concrete structures served as emergency shelter during the cyclone. Therefore, after the cyclone, once the immediate repair and restoration of thousands of damaged schools had been completed, steps were taken to undertake construction of newly designed school buildings in existing premises with a view to providing additional classroom space as well as making these structures double up as emergency community shelters during floods and cyclones in the coastal areas. Post-disaster situations also provide opportunities for addressing many long-standing needs and demands of the people and to pay attention to unfinished developmental tasks. For example, after the super cyclone in Orissa, about ninety go-downs were constructed for storing food grains in areas highly vulnerable to cyclones and floods. This was long over due, but their completion after the 1999 cyclone ensured that these were put to best use during the 2001 floods. This initiative was further amplified by building small go-downs at the gram ‘panchayat’ level. Again, this came in very handy during the 2003 floods. Pre-positioning of food-grains at district, block and gram ‘panchayat’ levels ensured timely relief during floods.

11.2 REQUIREMENTS IN SHELTER PROVISION

11.2.1 Temporary Shelter

Shelter means interim housing to meet basic immediate needs of disaster victims, through provision of tents or quickly assembled houses made of a range of materials including wood, plastic, tin, etc. It is the primary component of post-disaster rehabilitation.

Designated Shelters is another important term used, which means public building utilisation and use of any other existing safe facilities before or during disasters to protect people from destructive forces. These are also called community shelters.

The objective of a temporary shelter is to assure necessary shelter for families in order to safeguard peoples' lives from exposure and further sufferings when once a devastating disaster has snatched their homes from them.

Shelter is also a major requirement during major disaster situations such as wars or famines which create/exacerbate the refugee problem in significantly large proportions. The Asian Disaster Preparedness Centre (ADPC) has produced tools and resources for post disaster relief. As per ADPC, shelter provision has to cater to the following requirements:

PREVENTIVE SITE AND SHELTER MANAGEMENT GUIDELINES

PROBLEM	PREDICTIVE INDICATORS	PREVENTIVE STRATEGY
<i>Overcrowding</i>	High rate of influx into confined area.	For contingency planning, negotiate suitable sites with government before influx occurs or at early stage of refugee situation if possible, should have potential for expansion in order to avoid relocation or increased population density.
<i>Exposure</i>	• Historic or standard weather patterns of rainy or cold periods. • Lightweight tents or other un insulated structures in areas in area with seasonal cold patterns • Insufficient heaters/stoves/fuels	• Provision of suitable shelter for example insulated or heatable tents or other structures; also distribute stoves, mattresses, warm clothing, blankets or sleeping bags • Stockpile additional blankets • Purchase additional heaters/stoves. • Fuel distribution system • Fuel stockpile, and/or consider alternative fuel sources to bridge gap. • Relocation of population to better-sheltered or warmer areas.

Contd...

<i>Domestic violence/Social disturbances</i>	• Overcrowding • Lack of privacy	• Meet minimum space standards for site area and shelter, space requirements. • Provide at least visual privacy, especially for populations sheltered in communal buildings.
<i>Fire</i>	• Overcrowding • Site area too small for number of tents/structures, shelters are very close together or are touching • Dry windy weather conditions • Dry combustible shelter materials and individual open flame heating or cooking stoves or areas.	• Provide adequate fire breaks between structures. • Provide fire extinguishers in strategic locations, for example stores/warehouses, admin, buildings etc. • Space structures apart to reduce risk of spread of fire • Public awareness campaign • Establish fire brigade • If possible, stoves/cooking areas should be protected from the wind (wind shields). This will also reduce amount of fuel required. • Indoor cooking/heating only with suitable heaters, open fires are to be avoided. • Organise and promote planting of trees and hedges to reduce wind spread. Also helps reduce dust and wind spread.
<i>Mud/Standing Water</i>	• Pattern of rainy weather • Flat low lying site • Flood plain location • No other existing structures in fixed assets in the area.	• Select site with slight slope (2 percent) if possible, regardless of climate, rainy or arid. • Use culverts for drainage if roads are improved by raising the road surface. • Include drainage plan and ditching in initial site layout. • Special attention must be paid to drainage around water points.

Source: Compiled by DMC, 1992, UNHCR Emergency Tools Series draft#2, 1992, in ADPC, 2000.

The crux is that shelter rehabilitation concerns spread across the following aspects:

- **Socio-economic**

Shelter is meant for people. This fact governs the principle that shelter should be designed to meet the requirements of people without any detrimental impacts on their health, socio-economic status and lifestyles. This in turn requires that planning and implementation processes for shelter programmes should be participatory in nature. Participation does not

mean *consent*; rather it means *consultation*. Specific issues that need attention are, beneficiary participation, spatial relationships between families, involvement of women, and common activity spaces.

- **Physical and environmental**

Post-disaster shelter reconstruction is a particularly sensitive area of work, since it is usually carried out under severe time pressure, not providing/allowing enough room for normal planning processes to take shape. It therefore becomes more important to pay extra attention to physical impacts, both on the community as well as on the environment. Issues requiring attention are; relocation decisions, personal open spaces, infrastructure, and local environment.

- **Technical and Structural**

Structural compliance according to local hazards is of paramount importance for ensuring future safety of re-built houses. Poor construction or hazardous location can put people in such temporary shelter to risk of another disaster. Though this objective is given due importance in most shelter reconstruction programmes, the means are often not sensitive enough to the socio-economic and environmental concerns discussed above. Therefore, technical interpretations, adaptations, and translations gain critical importance. Specific issues of concern are structural safety, site and services planning, activity space planning, thermal comfort, protection, and socio-cultural compliance.

- **Shelter Location**

The first question that arises in a shelter reconstruction programme after a disaster is whether to rebuild at the same location or to relocate. This is an issue with not just physical, but also social and economic implications. A number of options have been tried in the past, and each one of them has its own merits and demerits. The three basic options are:

- 1) **Rebuilding at the Same Location**

This seems to have the greatest advantage. It does not involve issues of land acquisition, or of conflicts between relocated communities and host communities. Much of the rubble can also be recycled and used in the reconstruction work, saving on material costs, transportation costs, and time. This option cannot work when the land or resources at the original location are damaged or contaminated beyond repair, or if the original location has proved too vulnerable.

- 2) **Relocating the Entire Settlement**

Relocation of a settlement is usually a time consuming process involving land acquisition. If the community whose land is acquired is unhappy with the situation, it could turn hostile. While relocating, the entire settlement has to be planned from scratch, since similar other local sensitivities are involved such as local superstitions and religious/cultural proclivities. Relocation is a last resort option, and is best avoided as far as possible. However, if it has to be resorted to, it can provide an opportunity to fill those service gaps that existed in the old settlement.

An additional issue in relocation is, what happens to the original settlement. Many times it has been seen that the community continues to occupy and live in the old settlement. They patch up their damaged houses and live in them, while the new houses

are used for storage. This is highly undesirable because it not only leads to a wastage of resources, but also leaves the community still living in vulnerable shelters.

3) **Relocating Part of the Settlement**

The worst of the options, it has often been exercised when opinion within the community has been divided on the relocation issue. In one sweep, it destroys the social fabric built over generations. If the community is fractured, the issue first needs to be addressed through better engagement rather than breaking apart the community.

Ten-point Guideline for Shelter Provision

Numerous agencies are working in the affected areas for shelter provision. Different approaches are being adopted in different areas, with varying materials, sizes and processes. A ten-point guideline on temporary shelter provision prepared in the aftermath of the Kashmir Earthquake of 2005 by Prof. Ian Davis is as follows:

1) **Monitor what is going on**

Use this disaster to inform the coordination agencies about what goes on in this sector, at micro and macro levels, such as, who is deciding on shelter approaches; where is the expertise; what the popular wisdom on shelter is; what are the dilemmas and conflicts? etc.

2) **Tents**

The likelihood is that a wide variety of tents, with varied specifications will arrive, some very appropriate, while others are hopelessly unsuited for the climate or cultural conditions. Who adopts what specifications and, is there any quality control or standardised specification? If families tear their allocated tent to use the canvas in creative ways this can be highly effective, yet in some contexts, some 'tidy minded' officials have been known to banned this adaptive process.

3) **Standards**

Minimum standards of shelter provision are given under the *Sphere Project*, and are accepted around the world. These should be adhered to, and adapted where there is a need for modifications. The basic principles of the standards should be ensured in all temporary shelter programmes.

4) **Location of Tents**

Where possible, families should be allowed to take a tent and put it near their house rather than on a centralised campsite. Reasons for this are obvious; it would provide for better care of domestic animals in rural settings, protection of household belongings that may remain within their ruined dwellings and maintenance or recovery of livelihoods that may be linked to the home.

5) **Shelter Materials**

Probably, one of the best policies is to distribute shelter materials, such as blankets, roofing, sheeting, plastic sheeting, lengths of planed timber, building tools, wire, rope, nails, etc. Where possible, these can be sold where people have money to avoid dependency, but where people do not have resources, they can be donated. If the materials for

roofing, sheeting, etc., can come with expertise and the support of skilled volunteers to assist in building, this will enhance the process.

6) **Shelter for Families with Damaged Dwellings**

Aftershocks can bring down damaged, but standing houses. Therefore, such families need to be advised to sleep outside their homes in tents or improvised shelters even if they spend time in the day in their homes. The risks are very high when they are lying flat, sleeping and a damaged structure collapses. *Rapid damage surveys* need to check on this issue as a vital measure to avoid further losses of lives from aftershocks.

7) **Local Advice Centres**

Repairs begin immediately, regardless of whether or not the government seeks to stop the process until structural safety surveys have been undertaken. Small teams can be assembled, comprising volunteer engineers/ architects/ builders who can be assigned different areas to offer advice concerning shelters and repair and rebuilding options.

8) **Transition Housing**

An effective strategy is to seek to help families to create a transitional dwelling that will eventually develop into a permanent dwelling. This is a preferable approach to providing expensive rehabs that will later be replaced by another permanent home (In effect this a wasteful double reconstruction approach). The aim is to use the sheltering process to accomplish three things: provide shelter, strengthen local livelihoods and aid the psychosocial recovery process.

9) **Debris**

In many disaster situations there is often large-scale destruction of building debris during the clearing and recovery process. Vital timber and masonry debris is destroyed in the process. It is essential to collect useful building debris for recycling purposes.

10) **Shelter Units**

Each disaster will attract a community of intrepid inventors or commercial opportunists who seek to convince officials to place big orders for their novel creations made of cardboard, plastic, polyurethane, etc. Such designs are essentially innovative answers seeking a problem. They often cost far more than tents and shelter materials; they can be culturally and climatically inappropriate and can take ages to deliver. There are better alternatives available as noted above.

11.2.2 **Community Participation**

For an economically well-established person, it is obvious that he will get an architect to design her/his house as per her/his needs and lifestyle. However, for the poor, particularly in the aftermath of a disaster, this is usually not an option. Since the government or a donor agency is providing for him, he must accept whatever is handed out. This is why the rehabilitated arena is dotted with *row housing schemes* constructed as per a template designed by a far-away urban architect or designer. There are numerous examples where beneficiary communities refused to live in such houses provided to them.

Recent improvements in the process have been that the team does a survey and then designs a few alternate plans, which the community as a group is asked to choose from. This is still not good enough. *Consultations have to go beyond consent.*

It must be appreciated that the families receiving assistance still do have a right to decide what their house should be like, within the given resource constraints. The shelter provider's job is to ensure that the new houses and settlements are adequately disaster resistant.

True consultation often throws up those very small and basic needs that are often overlooked by remote designers. Though a qualified architect or engineer is surely competent to create a physically compliant shelter, these small local community based aspects of shelter are the ones that make it socially compliant.

The inference is that a shelter design is good only if it is acceptable to the families it is meant for. The way to ensure its acceptability is to design it with the community. There have been various well-documented examples of this, the world over. Action planning for housing is an accepted good practice, wherein community groups take part in needs assessments, prioritisation, consensus building, design, budget analysis, constraint based design modifications, construction planning, implementation and monitoring.

Participatory design process can be very effective. The role of the qualified designer is one of facilitation, while the community leads the process. It works well even with illiterate groups, using symbols, models and articles, around which group discussions and activities are organised.

As brought out in the World Disasters Report of 2002, people in southern Sri Lanka fought drought with self-help mitigation measures with assistance from an NGO. For two years, southern Sri Lanka suffered the worst drought in half a century. Crops failed for five consecutive seasons. Livestock died, water in wells dropped to dangerously low levels. Malnutrition rose to dangerous levels, school attendance dropped. An estimated 1.6 million people were affected. The drought-stricken community of Muthukandiya approached a local NGO about the problem. A mitigation initiative was launched, based on low-cost "rainwater harvesting" technology, which uses tanks to collect rain channeled by gutters and pipes as it runs off the roofs of houses. Villagers participated throughout the planning process. Two local masons received on-the-job training in building the 5,000-litre household storage tanks. Each system cost US\$ 195, equivalent to a month's family income. The community, in the form of materials and unskilled labour, provided half the cost. The NGO contributed the rest. Households learned how to maintain the tanks, and the whole community was trained to keep domestic water supplies clean. A village rainwater harvesting society was set up to run the project. Evaluations clearly show that the 37 households with storage tanks have considerably more water for domestic needs than households relying on wells and ponds and up to twice as much during the driest months.

11.2.3 Requirement of Dovetailing Response with Risk Reduction

It should be realised however that temporary arrangements like shelter provision, stockpiling or warehousing have limited utility if not integrated with the larger/more essential goal of *risk reduction*. As rightly articulated in the World Disasters Report of 2002, risk-blind development is one factor in increasing vulnerability. Another is the absence of effective disaster preparedness and mitigation measures (for example, flood-proof embankments, early warning systems, evacuation routes, shelters, relief stockpiles, disaster response teams, public awareness). Below are some of the barriers to more effective risk reduction, as brought out in the World Disaster Report of 2002:

- **Geopolitics:** conflicts of the 1990s dominated the humanitarian agenda, pushing aside the problem of vulnerability to natural hazards.
- **No coherent risk reduction “community”:** professionals trying to mitigate disaster impacts are fragmented along institutional boundaries.
- **Risk reduction is seen as a separate sector,** when it should be mainstreamed into development and humanitarian programming. As a result, risk reduction concerns are marginalised or forgotten.
- **Risk reduction** is viewed as a technical problem with technical solutions. But the underlying factors that compel people to live in insecure conditions are rarely addressed.
- **Lack of resources:** donors dedicate far fewer resources to risk reduction than to relief. The European Community’s Humanitarian Office (ECHO), for example, spent just 1.5 per cent of its aid budget on disaster preparedness on an average.
- **Invisibility of risk reduction spending:** development programmes may include mitigation, but it is rarely reported in donor accounts (Twigg and Ariyabandu, 2002).

11.2.4 Environment and Infrastructure

Sustainable development refers to the *Green Agenda and the Brown Agenda*. *Green agenda* deals with environmental issues related to clean air and water, a healthy and natural environment. *Brown agenda* deals with provision of services including water supply, sanitation, drainage and solid waste disposal.

Rehabilitation shelter needs to be brown and green too. While browning apparently happens well with most construction programmes visible in ensuring taps and toilets and drains, many rehabilitated villages look like models made of concrete blocks, with not a single tree or green patch in sight. Clean looking paved surfaces replace the earthy ground with grassy patches and the shade giving trees. The dying village pond finally gives way to the overpowering overhead water tank. Ambient temperature rises, and cool breezes turn hot. Things are definitely *not green*. Greening is the least expensive of the shelter construction components. Usually, it requires almost no expenditure.

It is said that the brown agenda also needs careful adaptation. Many a times it is seen that utilities and services are cut and paste from an urban setting. In such cases, users may not take to the technologies offered, or pour-flush systems may be too water intensive and unviable, or drainage systems may have too less water for self-cleansing velocity. While planning for utilities and services, it is important to use technologies appropriate to local environmental conditions. It is equally important to do a reality check with socio-cultural practices and acceptability. Sometimes, technical interventions may require a long run-up of social mobilisation and education.

The initiation of this entire process can happen from some universal principles laid down. The SPHERE project standards are for humanitarian assistance given for minimum standards of basic infrastructure provision, including those needed under various shelter programmes. Other factors can be taken from similar sources, or derived empirically.

One more consideration that can be kept in mind while doing this is incorporating disaster mitigation and preparedness aspects. Shelter and site planning components in themselves should be based on sound principles of structural mitigation. From this can emerge non-

structural mitigation elements such as selection and placement of infrastructure and furniture etc. The green agenda can incorporate elements of nature in ways that ensure sustainable and safe habitat.

11.3 REQUIREMENTS IN WAREHOUSING AND STOCKPILING

For effective relief distribution, it is essential that the relief material is procured, transported, stored and distributed efficiently. Based on the experience with the December 2004 tsunami in Thailand, the USAID recommended the use of strategic transit points as the Uthapao air base in Thailand for stockpiling of relief material. The USAID however criticised the government's decision to source needed supplies such as tents, blankets and high protein biscuits from existing aid stockpiles in Europe and the Middle East. Local on-demand purchase of these items would have been timelier. Most relief agencies have tie-ups with supply companies in this regard, which makes stockpiling redundant. However, certain goods are not easily transportable, like tarpaulins and tents; besides communication is disrupted which reiterates the benefit of stockpiling of certain goods (The Economist, 2005). Therefore, warehousing and stockpiling form a very important component during the relief phase.

Planning Stockpiling and Warehouse Requirements

Stockpiling and warehouse requirements should be worked out in detail and preferably in advance so that these can be adhered to right from the beginning. It is more difficult to organise a warehouse once the material has been dumped in it.

- A warehouse must provide proper secure storage in terms of capacity and the preservation of the quality and quantity of the items stores. Cool, dry storage facilities are optimal. Warmth and dampness encourage infestation and growth of microorganisms. Every effort should be made to prevent supplies from being exposed to sun, rain, humidity or high temperature.
- Open storage areas should not be used, except for very short periods for goods that will not be affected by exposure.
- The necessary capacity for a proposed warehouse depends upon the number of beneficiaries to be served and the quantity of goods to be stored and distributed. Make provision for anticipated reserve and buffer stocks, but avoid ordering and holding contingency supplies for indeterminate future needs. Consider consumption rates and shelf life, and request supplies in manageable quantities.
- Warehouse buildings should be conveniently located and provided protection from rain, flash floods, dampness, solar heating, rodents, insects and birds. A single large building is better than several small ones. The warehouse must be secure against theft, with adequate fencing, lighting, and security personnel. The area surrounding the warehouse should be cleared and made to provide good drainage and easy access. Provide a special storage area for small, high-value items, with parking and loading/unloading area adjacent to the warehouse.

Stockpiling Facilities

Storage facilities are located at key points. Significant losses can materialise due to poor planning. Most of the following damages can be minimised by proper storage:

- Spoilage caused by inadequate protection during inclement weather;
- Stockpiling at wrong locations, which also leads to loss of time in delivery;
- Poor warehousing practices and facilities;
- Lack of proper security and supervision; or
- Prolonged warehousing supplies.

Stockpiling Practices

Stockpiling is a scientific process. Best stockpiling practices are based on scientific principles that help in increasing the life of the material and in easier and more efficient handling:

- Each stockpiling facility requires a stockpiling plan to allocate sufficient space for goods before a consignment arrives. Ideally the floor of the warehouse is laid out in a *painted grid pattern*, and each item marked in chalk to designate the area for each stack. In addition, a chart is maintained of the stockpiling plan, to identify available space at a glance and to locate stored supplies and their date of receipt easily.
- Goods should never be stored directly against walls; pipes, pillars, roof trusses or partitions because stacks place unacceptable stress on them, become inaccessible and subject to dampness. Stacks should be separated using straight aisles, at least one meter wide, to provide access for inspection, cleaning and loading. Foodstuffs should be well separated from other supplies to avoid damage from contamination. Fuels, lubricants and other hazardous substances should be stored in a separate building or a designated, protected area outside the main warehouse.
- A cleaning plan for the warehouse should be prepared, laying down the tasks, timing and assigned duties of the staff. Specific cleaning duties should be included in the job description for each warehouse staff member, and follow ups should be done to ensure that the work is done thoroughly, as scheduled. All the dirt should be removed daily.
- Supplies and food commodities should be neatly piled on pallets placed on a clean floor. Pallets should never project beyond the bottoms of the stack. Different items, different packages and consignments arriving at different times should be kept in different stacks. Stacks should be built carefully to ensure stability, maximise available space and facilitate stocktaking. With rectangular bags or boxes, the simplest method to pile the stock is to orient layers in different directions. This will prevent the stack from falling over.
- Goods must be issued in the order in which they were received. This should be kept in mind when planning the stack layout, so that stacks placed earlier at the rear of the warehouse are easily accessible when the time comes to issue them.
- Stacks should be positioned so as to benefit them most from available light and ventilation. Good, natural or electrical lighting will make inspection easier. Ventilation and good air circulation is best for quality preservation, in hot, dry climates. Ventilators should not be obstructed.

- Stack height should be limited to prevent excessive floor loading or pressure damage to the packing or the contents. Packages can be crushed or split by compacting caused by the weight piled above.
- Individual stack dimensions at the floor should not exceed 6 mt. x 6 mt., to facilitate inspection and cleaning.
- Packages should be piled in their upright position.
- Damaged goods should be piled separately. Different types of damaged goods should not be stacked together. Repairing or repacking should be done if possible. These repacked or repaired goods should be issued first if they are usable.
- In tents or improvised shelters, stacks should never be allowed to touch the fabric of the tent or the walls or roof of the shelter. In open areas, stacks should be kept away from the perimeter fence.

Suitability of Available Warehouse

Warehouses are often not easily available in post -disaster situations. Many times, make-shift arrangements have to be made in existing buildings such as schools or in the open or under tents if no suitable building can be found. The following conditions need to be kept in mind while identifying a warehouse:

- Easy access by road, rail, or water to facilitate receiving and issuing supplies.
- Sufficient capacity to meet forecast requirements for temporary or transit storage, reserve and buffer stocks.
- Sufficient floor area to permit easy stock handling and access to all stacks for inspection, stocktaking and pest control.
- Sound construction and dry and well ventilated building. The construction should be leak proof and there should be no broken windows. Doors should close securely with no gaps. Walls should be clean and whitewashed.
- Office space for warehouse supervisor, staff and warehouse records.
- Garbage disposal facilities.
- Lighting inside and outside the building; and making security fence necessary, if isolated.

Receiving, Handling and Issuing Stocks

The process of receiving, handling and issuing material at a warehouse location is a complex one as it involves different processes and different personnel. If the warehouse itself is the location of distribution, the issuing stocks also involve the arrival of a large number of people who are not aware of the warehouse processes. The following aspects need to be kept in mind in such a situation:

- Ideally, larger warehouses should have separate doors and work areas for receiving and issuing supplies. This arrangement will eliminate any confusion and potential scheduling problems when these activities occur simultaneously.
- Every consignment arriving at the warehouse must be counted and inspected carefully as the goods are being unloaded. Damaged packaging or commodities, should be

checked for:

- Packs with holes, or split bags
 - Broken or partially open crates
 - Dented, buckled or leaking drums or cans
 - Signs of wetness or stains on the surface of bags or cartons
 - Signs of insect infestation or decay
- The quantities received should match with those listed on the waybill, stores requisition or packing list. Where tampering is evident, carefully check the contents of packages for missing items. Sample bags should be weighed of bulk commodities to confirm unit weights. Random samples of commodities should be taken to check for quality, when appropriate.
 - The number of units/weight of the goods received and any amount, which has been damaged or lost, should be recorded. Consignment receiving reports should be submitted to the appropriate authority or agent, noting damage, shortage, excess or non-conformance, quantities, conditions and any extenuating circumstances. Insurance claims and follow up on claims documentation should be initiated where necessary.
 - Proper instruction should be given and timely supervision of the porters handling goods in the warehouse should be done, to ensure that the goods are moved and stored efficiently with minimum damage. Loading or unloading should never be done in the rain. Provision of suitable equipment should be made with trained operators, for large or heavy consignments. Use of trolleys should be made if these are available. Goods must not be dragged along the floor, dropped or thrown. Porters should not be permitted to use hooks which damage packaging and bags.
 - Only authorised officials may sign a written release order to issue supplies from storage. On receipt of a release order, the chief storekeeper confirms that the supplies are on-hand and supervises their turnover to the receiver's agent taking delivery. Stored goods are issued on a first in first out (FIFO) basis, that is, the stores received first are issued first because they have been stored for the longest period. This rule is applied consistently, except for usable damaged goods, which are always issued first, regardless when they arrived. The issue is recorded in the warehouse records.
 - A Store Requisition/Issue Voucher is prepared in three copies for each release order, with the receiver's agent signing to acknowledge receipt of the goods. Two copies accompany the issued consignment to their destination, while the original is filed with the release order. The receiver's agent obtains the signature of the receiver at the destination, returning one copy to the warehouse for matching with the original Stores Requisition/Issue voucher to confirm final delivery.
 - In long-term warehouses, periodic physical inventory of all supplies and food aid should be conducted to verify that the quantities on hand agree with the quantities shown on the Store Card and Stack Record Cards. Any shortages should be reported to the senior official responsible for warehouse operations, and investigation for the reasons for these shortages should be carried out. Quantities from the store's records should not be deleted without proper authorities to do so.

Fire Protection and Safety

Proper fire protection measures should be taken up in the warehouse complex to ensure safety from possible fire accidents. The following tips may be adopted:

- Define in advance the responsibilities and actions to be taken by individual personnel in case of a fire outbreak.
- Ensure that fire-fighting equipment is readily accessible both inside and outside the building and also that these are in working condition.
- Provide water and sand buckets, plus foam extinguishers if fuel and oils are present. Instruct personnel in the use of extinguishers.
- Strictly control smoking by all personnel whenever they are in the warehouse premises.
- Never store flammable material in the main place. All combustible waste should be discarded in metal bins and they should be cleared out regularly.
- Insure the warehouse against possible fire outbreak.
- Ensure good electrical wiring within and outside the warehouse.

Recommended Warehouse Cleaning Plan

Cleaning of the warehouse is very important to maintain hygiene and to keep the material from being wasted due to decay or pest infestation.

Before using the warehouse:

- Thorough cleaning of floors, walls, ceilings partitions, support beams, windows, doors and frames should be done. Treatment with insecticide is advised.
- Clearing of weeds and rubbish in the area surroundings the warehouse building should be done, to remove potential food sources for rodents and to eliminate places where insects may breed.
- Prompt cleaning of any spillage, especially foodstuffs and oil is needed.
- Each day, sweeping of the floor and disposal of the sweepings should be done.
- At the end of each week, cleaning of the building walls and the sides of each stack should be done. Cleaning up of weeds and rubbish in the area surrounding the warehouse should also be done.
- In case of long term warehousing, at the end of each month cleaning of the entire warehouse thoroughly, from top to bottom, should be done.

Periodic cleaning can be scheduled for:

- Sweeping the walls, stacks, and floor, wall/floor joints and all corners
- Cleaning of the roof beams and tops of the walls
- Cleaning of doors, frames and door channels

- Cleaning in sequences, from top to bottom, and from the farthest point inside the warehouse towards the door(s)
- A logbook should be maintained for the periodic maintenance and cleaning activities.

Record Keeping Procedures

Since large volumes of material are being handled and many personnel may be involved in the process, good record keeping procedures are important for maintaining accountability and for efficiency in ensuring that stocks are available when required. The following procedures are advised:

- Use of Stock Control Ledgers, Store Cards and Stack Record Cards.
- Recording all receipts, issues and balance on hand. Retaining a copy of the receipt/issue voucher or waybill for verification.
- Recording all inspections and pest control treatments.
- Verifying records by conducting a physical stock count periodically.
- For any stocked item lost or disposed of, recording the quantity, and an explanation of the loss or the reasons for disposal and the method.
- Submitting a periodic summary to the senior official responsible for warehouse operations.

Stores Inspections: What to look for

Stores inspection is an important task for ensuring that systems are being followed and there are no losses or risks of losses to the material being stored. The following inspections should be carried out:

Building and Area Inspection, comprising;

- Roof leakage or signs of flooding
- Broken windows or ventilators
- Badly fitted or damaged doors
- Cracked walls or floors
- Dirty or dusty interior
- Signs of rodent entry
- Damaged fences
- Broken or burnt out lights
- Inoperative or missing equipment
- Presence of garbage, discarded items

Stores Inspection Activities

- Checking for spilled commodities;

- Inspection between bags or packages in the stack, along seams, for signs of insects (webs, cocoons, etc.) or rodent damage;
- Looking around the stack base and under pallets for signs of insects (webs, cocoons, etc.) or rodent damage;
- Looking around the stack base and under pallets for signs of insects or rodents (for example, nests, droppings);
- Looking for water damage, fungus, caking, discoloration, stained bags or packaging leaks;
- Examination of stacks for damaged items mixed in with regular stock. Checking that damaged goods are stacked separately in the warehouse;
- Checking expiry dates on items with limited shelf life;
- In stored grain stacks, by lifting the top bag and feeling the bag underneath for heating, which can indicate germination/infestation in the stacks;
- Looking for swelling or rusting cans;
- Looking for flying insects that are usually a sign of heavy infestation;
- Watching for signs of theft;
- Checking in dark places using a good flashlight.

11.4 CONCLUSION

While building temporary shelters, along with the expertise from specialised agencies, local wisdom and traditional coping mechanisms should be considered while planning for temporary shelters. It is quite probable that traditional systems for temporary shelters are available in the area. Also, using the traditional system will be cheaper than an external design altogether. In any case, it will be useful to consult the community.

For warehousing and stockpiling, proper selection, supervision and control of warehouse and storage facilities cannot be left to the storekeeper alone. All officials in the field or attached to the operation must assume an active role to ensure that the supplies stored are adequately protected until they reach the beneficiaries. Warehouse protocols should be scientifically laid down and implemented.

11.5 KEY CONCEPTS

- | | |
|---------------------------|---|
| Temporary Shelter | : In the immediate aftermath of a disaster, it may not be possible to evacuate people immediately to officially designated shelters since road communications may be severely disrupted, as during floods, cyclones and earthquakes. Temporary shelters have to be set up, in the form of tents. Since stockpiling may not be available, food and medical supplies are airdropped in case of events such as landslides. |
| Designated Shelter | : Many existing structures at safe sites or otherwise well constructed structures such as schools, religious |

institutions, and hospitals, etc. can double up as designated shelters. Using hazard maps, official shelters are also created as part of disaster prevention on safe sites, which could be at some distance from the hazard site. All essential requirements are provisioned at such shelters.

- Warehouse** : Warehouse refers to a large building where materials can be stored. The Indian equivalent of a warehouse is a 'go-down.' Both, however, mean the same.
- Stockpile** : Stockpile refers to the stock of essential commodities, comprising perishable and non-perishable items which are needed using an emergency. Though stockpiling is indispensable; alternate arrangements are being worked out, such as, companies and non-profit organisations engaged in disaster response in contract with suppliers who ensure timely delivery at call.
- Protocol** : Protocol refers to the formal procedure or the rules and regulations that govern daily administration of an organisation. Breach of protocol results in bad precedents and hence, undermining of the organisation itself.
- Inspection** : Inspections have to be carried out periodically regarding stockpiling in warehouses to check for safe practices. Perishable items should be replaced on time and fresh supplies requisitioned.

11.6 REFERENCES AND FURTHER READING

Manual on Disaster Response, a Handbook for Emergencies, Church's Auxiliary for Social Action (CASA) at <http://www.christian-aid.org.uk/indepth/0307stor/04stormappendices.pdf>

Ten-point guideline for shelter provision by Prof. Ian Davis, prepared in the aftermath of the Kashmir earthquake, 2005.

Twigg and Ariyabandu, 2002, *World Disasters Report*, International Red Cross and Red Crescent Societies, John Twigg and Madhavi Ariyabandu (Intermediate Technology Development Group, South Asia).

UNHCR Handout, "Tools and Resources for Post Disaster Relief", reproduced by Asian Disaster Preparedness Centre, 2000, at, <http://www.adpc.at.in>

World Disasters Report, 2002, Chapter 1- Principal contributors: John Twigg (Honorary Research Fellow, Benfield Greig Hazard Research Centre, University College London) and Charlotte Benson, an economist specialized in the economic aspects of natural disasters.

11.7 ACTIVITIES

- 1) Contact organisations or government departments who are key players for relief operations during any emergency in your area. Study their mechanisms of stock piling and warehousing. Make a visit to the warehouse and interview the in charge. Compile your observations and prepare a report. If there is no disaster warehouse in your area, you can visit any large material storage facility and compare their systems with those discussed in this unit.
- 2) Make a list of facilities and items a family like yours will need if it has to live in a temporary shelter away from home for a few days. Make sure you include items of need for each family member. Identify special need items for children, old people and women.