
UNIT 3 LOGISTICS MANAGEMENT

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3.0 LEARNING OUTCOME

Upon studying this unit, you should be able to

- Understand what logistics is all about while responding to disasters;
- Discuss important considerations for supplies, equipment and transportation management as key components of logistics management;
- Understand the significance of documentation;
- Outline the common concerns for hygiene and sanitation; and
- Describe the common practices for Search and Rescue, Clearing of Debris and Disposal of the Dead.

3.1 INTRODUCTION

Logistics constitute a primary component of disaster response operations. Logistics have been described as the procurement and delivery of the right supplies, in the right quantities, in the right order, in good condition, at the right place and time. Though logistics are of primary importance during disaster response operations, they also play a key role in recovery programs. Thus, logistic considerations have to be taken fully into account during preparedness assessments.

Before the word logistics came into wide international usage (principally in the military field during World War II), an alternative term used sometimes was “supplies and transport”. These two latter activities, in fact, constitute the major components of logistics as currently applied to disaster management. They are certainly the two activities which are likely to be of most direct and practical concern to the majority of disaster managers.

3.2 LOGISTICS MANAGEMENT

As the management tasks during any disasters become largely a multi-stakeholders affair, several organizations engaged in disaster response may have their own logistics arrangements. For example, during the Gujarat Earthquake-2001, the logistics arrangements of the government were handled by the District Collector of Bhuj and the staff assigned to assist him whilst the United Nations agencies' logistics arrangements were handled by the logistics center set up in Bhuj by the World Food Programme.

The person handling logistics has the responsibility to manage and supervise logistical and aviation support to the incoming disaster managers teams, ensure that the teams receive supplies, equipment and services. During disasters, a typical logistics manager (or logistics coordinator) orders, receives, distributes and tracks the incoming and outgoing relief commodities. The logistics coordinator/manager usually reports to the team leader. Following sections focus on specific aspects of the logistics in disaster management, namely: Search and Rescue, Evacuation, Supplies, Transportation, Equipment, Hygiene and Sanitation, Documentation and Clearance of Debris and Disposal of Dead.

For a full-scale logistics operation, the following facilities will be needed: offices and administrative equipment, warehouses at various levels, fuel and spares stores, workshops, vehicle parks/motor pools, vehicles for management staff, fleets of trucks, special vehicles such as cranes, tankers and cargo-handling machines, communications equipment, and accommodation. The resources for a logistics operation usually come from a variety of organizations; from ones own organization, from the national authorities, from relief organizations, or from the private sector.

3.2.1 Search and Rescue

Over the past two decades, disasters in heavily populated areas around the world have increased the need for sophisticated Search & Rescue (SAR) capabilities to assist trapped victims. Recent improvements in technology have also increased the ability to locate, medically treat and rescue trapped victims. Many countries have developed a SAR capability and routinely send teams of well-trained experts to assist other countries in times of need. Recently, in India, we have witnessed such foreign SAR teams at work during the Gujarat Earthquake-2001. The accepted definition of the Urban Search and Rescue (USAR) with which the present day SAR Teams work is as follows:

“An integrated multi-agency response which is beyond the capability of normal rescue arrangements to locate, provide initial medical care and remove entrapped persons from damaged structures and other environments in a safe and expeditious manner.”

It should be noted that in India we do not yet have a fully developed search and rescue capability as compared to some of the advanced nations. In India, traditionally and routinely, these tasks are being performed primarily by the Indian Armed Forces

assisted by the local residents and at times, other organizations. However, learning from some of the recent disasters that have struck our country, all efforts are being made to develop such capability within the country, especially within the local emergency management authorities.

For instance, under the National Disaster Response Plan (a document prepared by the High Powered Committee on Disaster Management, September 2001) the Ministries of Defence and Home Affairs are charged with the responsibility for “search and rescue” as one of the Emergency Support Functions. The Gujarat State Disaster Management Act (Act No. XX of 2003) Chapter XI, Section 27 casts the responsibility of carrying out search and rescue operations on the police force, *gram rakshak dals*, home guards, civil defence units and fire services. It should be noted that the Gujarat Disaster Management Act is the first of its kind in our country and other States are in the process of drafting such Acts.

With this background, let us now study how search and rescue operations are conducted worldwide and what are some of the standard accepted practices for conducting search and rescue.

SEARCH TEAMS:

The Search Teams are expected to have the capability to perform physical search, consisting of conducting interviews with survivors and a systematic movement across the site while listening for calls for help; canine search (search by dogs specially trained to find out trapped victims under debris of fallen structures and avalanches) and electronic search using sophisticated listening and seismic equipment. These three primary types of search allow search personnel to focus on the most important potential rescue opportunities.

Prior to initiating search operations, the team must determine the search strategy to be followed. This should be based on detecting and locating the greatest number of victims in the shortest amount of time. A plan should be developed which prioritizes the search opportunities based on a number of factors, including occupancy, time of day, and local information on missing persons. In most cases, if the local rescuers have not identified locations of trapped people, the team’s search operations will begin with a rapid initial search of their assigned area followed by a more thorough main search.

- ◆ The Search Team is usually tasked with determining the type of assistance needed as follows:
 - Whether technical equipment and dogs are required;
 - What type of lifting, pulling, cutting, digging and lighting equipment will be required for rescue operations;
 - Whether medical assistance is needed to oversee and aid in victim extraction;
 - What special operations will be required to remove hazardous materials, demolition, shoring of dangerous structures and damage repair.

SEARCH STRATEGY:

This involves developing a process for detecting and locating the greatest number of victims in the shortest amount of time. There are two basic types of Search Strategies:

- Initial search which is less in depth but more rapid. This is composed primarily of physical and/or canine search operations.
- Main search which is a thorough search. This would be composed of in-depth search operations with electronic equipment supported by canine and physical elements.

The Search Prioritization is based on:

- type and size of occupancy
- number of potential victims
- condition of structures
- time of day of occurrence post event
- safety and security considerations
- work area accessibility
- local information
- availability of resources
- limitation of resources

SEARCH PLAN:

A search plan will ensure that all the Search Group's efforts are brought to bear in a systematic and coordinated manner, utilizing the most up-to-date intelligence about victims and buildings combined with trained and briefed search personnel. This includes:

- ◆ Development of a search plan based on the results of:
 - Area assessment – a broad reconnaissance of an assigned area
 - Structures triage – an assessment of hazards and a prioritization of potential victims of the involved buildings/structures
- ◆ The Search Plan should include:
 - Search objectives and priorities
 - Strategies and tactics
 - Resources assigned
 - Available maps and drawings
 - Safety and security considerations
 - Coordination and communication issues
- ◆ The Search Plan is implemented by (a) briefing all personnel, (b) deploying search personnel, (c) evaluating for operational effectiveness and (d) revising the plan as appropriate.

INSARAG

As a cooperative effort by the United Nations and many of the participating countries in international Search and Rescue operations, the International Search and Rescue Advisory Group (called INSARAG) was formed in 1991. The Secretariat of INSARAG is located at the Geneva Office of the United Nations Office for the Coordination of Humanitarian Affairs [known as OCHA now, what was earlier called first the UN Disaster Response Organization (UNDRO) and later the Department of Humanitarian Affairs (DHA)]. The INSARAG participants have developed a

common understanding of the functions and operations of SAR teams which have resulted in the development of the International Search and Rescue Response System. The INSARAG Guidelines prepared by this group provide an overview of the System.

It is important that information related to structure identification, conditions and hazards, and victim status are posted in a standardized fashion to ensure uniformity and clarity, as SAR team participants engaged at a particular disaster site may originate from countries around the world. The purpose of the INSARAG Guidelines is to standardize the identification of SAR team functions (by color), the conspicuous identification of work site hazards, standardize mapping, sketch and landmark labeling with common symbols, ensure the accuracy of search assessment markings and to document SAR team accomplishments.

Given that the first 48 hours are crucial for saving lives of the entrapped victims under the debris following an earthquake or a landslide, it is of utmost importance that various SAR teams at work do not waste time by visiting a building twice (i.e., searching a structure again not knowing that it has already been searched by another team). The INSARAG Guidelines, therefore, lay down procedures to be followed by SAR teams for (a) Common Identification System (marking, signaling), (b) Structure Assessment (go or no go, search, rescue, special hazards of that structure and victim location), and (c) Results (warning, tracking, continuity and interpretability).

RESCUE OPERATIONS:

Rescue operations follow the search phase and are focussed on extricating the greatest number of victims in the shortest amount of time, prioritizing technical rescues that cannot be addressed by local resources. Based on the search results, the team must prioritize the rescue sites and determine what resources are to be committed to a rescue site based on the potential success. Generally, rescue operations are prioritized based on rescues that are easily achievable and moving on to those that are more complex. A rescue plan will ensure that all efforts are brought to bear in a systematic and coordinated manner, using the most up to date intelligence about the victims and buildings.

The overall Rescue Operations are comprised of the following five phases:

PHASE ONE: Assessment of the collapsed area. The area is searched for possible victims (surface and/or buried) and the evaluation of the structure's stability and potential danger to rescue personnel is performed. All utilities must be evaluated and controlled for safety.

PHASE TWO: Removal of all of surface victims as quickly and safely as possible. Extreme care must be used during this phase to ensure that rescuers do not become victims. Personnel should not be misled by the outward appearance of a structure – what appears to be a settled pile of debris could, in reality, be lacking any genuine support and a secondary collapse could occur without warning.

PHASE THREE: All voids and accessible spaces created as a result of the collapse must be searched and explored for live victims. An audible call out system can be used during the phase. Only trained canine or specially trained rescue personnel should be used in voids and accessible space searches.

PHASE FOUR: Selected debris removal, using special tools and techniques, may be necessary after locating a victim. It may be necessary to remove only certain obstructions that are blocking access to the victim. Information concerning a victim's location prior to the collapse can be helpful during the selected debris removal phase. Information gathering on other possible victim locations can greatly enhance the operation.

PHASE FIVE: General debris removal is usually conducted after all known victims have been removed. Exceptions would be 1) when information is obtained that indicates the possibility of other victims not originally accounted for and, 2) when large amounts of debris are impairing or obstructing operations. The decision to use heavy equipment during this phase must be given serious consideration, especially when the possibility exists that there are still live victims in the debris.

3.2.2 Evacuation

The term "evacuation" refers to moving people at risk to safer environment. The evacuation of communities, groups or individuals is a frequent requirement during response operations. Evacuation is usually PRECAUTIONARY – in most cases undertaken on warning indicators, prior to impact, in order to protect disaster-threatened persons from the full effects of the disaster- and POST-IMPACT – taken up in order to move persons from a disaster-stricken area into safer, better surroundings and conditions.

Populations at risk are those groups of people adversely affected by a disaster – natural or man-made – who have been placed in situations where they are at an increased risk. They are at risk because of the disruption or loss of their normal community and social support systems that provide the critical elements of their survival: water, food, shelter, health care and sanitation.

It should be noted that evacuation is possible only in those events where an early warning of the forthcoming disaster is available. For example, upon receiving a warning message regarding a forthcoming cyclone or rising river levels, the population from the vulnerable areas (which are likely to be hit by the cyclone or get flooded) could be moved quickly to other safer locations. The standard **Evacuation Kit** for such evacuees should contain following items:

- Emergency supplies to last for at least 3-4 days (or more, depending upon the projected severity of the forthcoming cyclone/flood);
- Emergency survival kit;
- First Aid Kit and essential medical supplies
- Clothes/blankets/sleeping bags
- Food and water
- **Rescue Kit** containing a paddle, rope, iron hooks to tow belongings and/or other rafts, container to bail out water, torches, lanterns, candles, a transistor, an anchor, life jackets or tyres and other floatable objects.

The longer the negative impacts on populations at risk increase they are displaced from their homes. As such, it is essential that the evacuation operations are taken up

by organizations that are well-trained in handling such matters. Local residents' clubs, local organizations and local NGOs who possess the first-hand knowledge about safer and convenient grounds for moving people as well as animals could be relied upon in working out evacuation plans. Such evacuation plans need to be well conceived prior to any disaster and should contain arrangements for stock-piling of essential supplies of food, drinking water, temporary shelter, medical care as well as special requirements of children, the aged and ailing and expectant mothers.

In India, the District Collector through the Relief Commissioner (or Relief Secretary) of the State keeps in regular contact with the Indian Meteorological Department (based in New Delhi with observation station spread out) keeping an eye on the warnings for floods and cyclones. In the event that a warning is received and an assessment of threat to people and property is made, the evacuation procedures are then initiated by the Collectorate. For example, the Gujarat Relief Manual (1982) Chapter XIX, Section 304 (1) (a) provides for procedures in setting up and operating an **Evacuation Center** to cope with floods and likely calamities.

This Section empowers the Collector and/or the District Development Officer (DDO) to determine in consultation with Prant Officers/Mamlatdars the safe villages/places which will serve as Evacuation Centers. The Manual further provides that each Center should cover a group of dangerously exposed village or parts thereof, the people of which should know before hand the names of such villages which will serve as their Evacuation Center.

Section 304 outlines that the Evacuation Center should be properly selected. It should be close to its groups but safe from the ravages of floods. It should be fairly big place so it can, for a day or two shelter the evacuees and their cattle and their feeding can be possible. In selecting an "Evacuation Center" the Relief Manual requires following considerations to be kept in view:

(a) safety, (b) proximity from its satellites, (c) availability of good drinking water, (d) its economic resources, (e) proximity and accessibility to its parent "Relief Center", and (f) availability of open space where carts, cattle etc. of evacuees can be kept till they move to the "Relief Center".

The Gujarat Relief Manual further requires that each of these Evacuation Centers should set up a committee of workers having organizing ability and the spirit of service. There should be a panel of messengers. It may also be necessary to select a place for use as a community godown to keep stock of foodstuff in such villages. These Centers will not be expected to shelter and feed evacuees for more than a few days. As soon as possible these people should, unless the Evacuation Center is in a position to keep them longer, be moved to the parent "Relief Center". These Evacuation Centers may appropriately be described as the "first line of defence against floods".

Once the disaster strikes, no one is spared. At times, the impact of the disaster coupled with the aggravating safety and security conditions in a particular area warrant evacuation of everyone. During such times, not only the populations at risk but those who come to help the local authority and the affected people also have to keep ready their evacuation plans.

For example, the Evacuation Plan of the United Nations Disaster Assessment and Coordination Team (known as UNDAC Team, comprising 4-6 experts who are immediately deployed to a disaster site, upon receiving request from the affected government, to assist in coordinating rescue and relief) divides evacuation operations into three categories:

- (1) Semi-Evacuation – when it is necessary to reduce personnel down to a skeleton team;
- (2) Full Evacuation – when there is enough time for the whole team to evacuate in an orderly manner and take all the equipment, vehicles etc., with them;
- (3) Emergency Evacuation – when there is time for the team to take only the most necessary equipment and vehicles. The contents of these evacuation plans are:
 - Always keep sufficient amount of money for evacuation purposes;
 - Always keep a fuel reserve ready for vehicles to be used;
 - Pin-point vehicles to be used for emergency evacuation;
 - Find potential routes to be used out of the area;
 - If possible, make agreements beforehand with authorities, border posts, NGOs etc.

Depending on the safety and security situation in a given country, the United Nations Secretary General orders evacuation (which is Phase V of the UN Security Plans) of its employees on the recommendation of the Designated Official. Evacuation of the UN employees from a country is carried out according to plans prepared beforehand and in accordance with the country-specific situation.

Evacuation is thus a constantly recurring need in disaster management. Whether there is long warning, no warning or short warning, disaster managers are required to handle the evacuation process with reasonable effectiveness. It should be noted that the evacuation decisions are like to go wrong:

- When there is insufficient study and analysis of the disaster threat;
- When preparedness levels are inadequate;
- Where the disaster-prone communities are not attuned to the possibilities and risks of evacuation;
- When everyone, including the community, is not absolutely clear about the responsibility for decision making and the evacuation process.

3.2.3 Supplies

The term “supplies” in the disaster response context is understood as “relief supplies and commodities”. The ready availability of relief supplies and commodities is an important factor in effective response. After disaster impact, there is usually an urgent need to provide and distribute: food, drinking water, essential clothing, shelter materials, medical supplies and assistance for medical care, sanitary facilities.

The major challenges associated with “relief supplies and commodities” are (a) obtaining the various commodities from the government stores, emergency stockpiles, commercial supplies and international assistance sources (in the event, such international assistance is welcomed and accepted by the affected country) and

(b) organizing the distribution of these commodities according to the best possible orders of priority.

Given that major disasters make big news – not only in the country but across the world, it becomes most important to manage the incoming relief supplies and commodities that begin to flow to the affected area from within and outside the country. Experience has it that unless well thought out in advance and well coordinated, the management of relief supplies is exposed to the threat of mal-practices and large-scale wastage of resources.

Various response tasks need the use of various forms of operational capability, usually in the form of vehicles, boats, air crafts. They also require the availability and utilization of various forms of supplies which may include:

- Petrol, oil and lubricants
- Technical spare and repair parts
- Personnel subsistence and support commodities, including food, medical and health items, tents and so on
- Administrative items of various kinds, for instance, standard report forms and other requirements for survey and assessment.

During response operations, the availability of commodities is likely to be hampered by the disaster impact. Disaster management authorities therefore, need to keep an ongoing operational check of the balance between:

- Assessment of commodity needs as progressively updated by survey and assessment action;
- Availability and timing of in-country/local commodities and
- Availability and timing of international assistance supplies (in the event, international assistance is welcomed)

Forecasting the supplies management is a challenging task for the disaster management authorities. Such forecasts, when attempted in detail in advance provide a reasonably accurate picture of how logistic aspects would apply to a particular disaster situation. For instance, in case of major flooding, a forecast could be made of:

- What supplies and transport facilities might be lost or cut off, and for what period (like supplies inundated, roads cut or washed off);
- What areas would be accessible or inaccessible for supply purposes;
- What effects the evacuation of communities would have on logistic requirements, in terms of both evacuation movement and the subsequent supply of essential commodities to the evacuees;
- What special logistic items might need to be brought in to reinforce existing capability (like special flood boats for rescue and/or relief supplies purposes).

The National Disaster Response Plan (prepared by the High Powered Committee, September 2001) has put the Ministry of Planning and Programme Implementation as the Ministry responsible for the procurement and distribution of relief supplies, as one of the Emergency Support Functions.

3.2.4 Transportation

The effective distribution of relief supplies and commodities is largely influenced by the availability of transport and the serviceability of transport systems. For this reason, some advanced countries are always researching innovative methods of transporting relief supplies and commodities. For example, one of the European countries that provides equipment support to international disaster management teams (like the UNDAC Team), has developed collapsible hospital kits that could be transported on horse-backs (or mule-backs) to areas with difficult terrain.

It may be recalled that during Gujarat Earthquake-2001, along with the Turkish Military Hospital set up in Bhuj by the Turkish Army, the Danish government had also flown in a 50-bedded mobile hospital (flown to Mumbai first and then transported to Gandhidham near Anjar by ship via Kandla port and further by road) that began conducting orthopedic surgeries from 31st January 2001. The search for easy to transport equipment (like mobile hospitals, water purification systems and water storage tanks, emergency vehicles, medical equipment, tents for setting up logistics centers and smaller coordination camps etc.) during disasters is thus continually progressing. Effectiveness of response is thus determined by following conditions:

- Loss and/or damage inflicted by the disaster on the access routes;
- Flexibility in transport capacity and systems, especially the ability to switch resources from unaffected areas to disaster-stricken areas;
- Ability to procure transport resources by requisitioning and/or charter;
- Difficulties of transport access to some stricken areas, due to remoteness, severed communications or severe disaster effects;
- Limitations or benefits resulting from preparedness; for instance, earmarking (or otherwise) of emergency transport capability in plans and departmental standard operating procedures;
- Types of transport available (for instance, remote mountain areas or areas which are isolated by disaster effects cannot be supplied unless airlift/airdrop capability is available; limited four-wheel drive capability may also be a restrictive factor).

Communities with strong leadership, authority and self-governance certainly aid the process of response. The optimum use of self-help from stricken communities facilitates transportation of supplies. In many cases it has been found expedient to deliver bulk supplies (by boat or airdrop) to various convenient points from which they can then be collected by responsible community representatives or groups and further distributed to affected families as required.

On a preparedness basis, following sources of transport could be assessed:

- **Road:** government transport capability; commercial transport capability for charter or requisitioning; private vehicles for charter or requisitioning; international agencies and contractors working on in-country projects;
- **Rail:** Railway network, stations and sidings;
- **Inland waterways:** river and canal shipping systems, with capabilities and restrictions; government and commercial craft; private craft including local boats and canoes, which may provide vital transport to remote locations;

- **Sea, Coastal and Inter-island shipping:** government vessels; commercial vessels for charter or requisitioning; private craft (e.g., launches, motorboats); and
- **Air Transport:** accessible air ports with facilities.

3.2.5 Equipment

The term “equipment” in the disaster response context, refers to a wide range of equipment used by disaster managers and rescue workers to assist the affected community. A quick recollection of the media coverage of the Gujarat Earthquake-2001 would bring to mind a variety of equipment that was used by national as well international teams in saving lives and rescuing entrapped victims. Such equipment included: gas cutters, earth moving equipment, tents, water storage tanks, plastic sheeting, hard hats, face masks, gloves, cranes, dumper trucks, water truck tankers etc.

The need for a particular type of equipment is determined by the nature of the disaster/emergency and the extent of its impact. For example, the equipment support following a major earthquake will contain largely the equipment for removal of debris of fallen structure (like earth moving equipment, bulldozers, cranes, gas-cutters, shovels, axes and spades), transportation, medical care, immediate shelter provision (plastic sheeting, tents, temporary construction materials such as tins, bamboos, etc.), food supplies, drinking water, mobile hospitals and mobile sanitation facilities etc. In case of flooding, the equipment support would largely contain boats of various types, plastic sheeting, movable food stocks, vaccinations and other medical care.

The professional disaster management teams that usually assist the affected government and people all over the world carry a standard set of equipment for their use. Let us see one example. The UNDAC Team’s Equipment (United Nations Disaster Assessment & Coordination Team) consists of:

1 Subsistence Support Equipment

- 4x3 man tents
- water purification equipment for 8 persons
- electricity – 2kva generator plus cables etc.
- sanitation equipment
- food and cooker
- miscellaneous equipment, e.g. chain saw, torches, shovels.

2 Office Support Equipment

- One office tent
- Three lap tops with English software
- Three printers with toner and 2 cartridges
- One small copying machine
- One INMARSAT M (satellite phone) with fax
- One table and two chairs, collapsible
- White board, collapsible

3 Telecommunications Support Equipment

- INMARSAT Mini M + fax
- Two lap tops with Email access and MS Office

- Six VHF Handsets
- One Base Station (for VHF Radio)
- Two kva generators

4 Transport Support Equipment

- Two 4x4 all terrain vehicles with fuel
- Telecom fitted in vehicles
- Maintenance equipment
- Inflatable rubber dinghy – two

5 Specialist/Medical Support Equipment

Medical or Specialist Equipment and personnel could be a part of the module depending on the needs of the mission, for instance, nurse with basic medical equipment, air traffic controller for controlling incoming aircraft/helicopter at disaster site.

The equipment carried by assisting teams to the site of disaster follows the principle of “self-sufficiency”. As time is short during any disaster and as the challenging task is to save maximum lives in shortest possible time and prevent further damage to property and infrastructure, the groups assisting the local administration and the affected people do not intend to be a burden and hence go to help being self-sufficient.

In order to be effective during response phase, the logistics coordinator needs to take into account the availability of equipment as well as the requirements for equipment prior to a disaster. Maintaining inventories of various types of equipment, their condition, location, modes available for their transportation, availability of skilled persons to handle specialized equipment (operators) thus needs to be documented and checked periodically.

3.2.6 Hygiene and Sanitation

Usually following a major disaster, respiratory infections, malaria, diarrhoeal diseases and other common diseases need to be dealt with in a decentralized network of health care facilities (health centers and health posts, health camps). Organizing these in situations where there are many different operating partners requires good coordination amongst them. Manuals and guidelines allow standardization among partners in regard to essential drugs and therapeutic policies. Medical needs (material and drugs) are to be quickly assessed in anticipation of outbreaks of diseases known to occur locally. Experience acquired by health practitioners over the past management of disasters has led to the creation of “kits” of essential drugs and materials.

During the response phase, the common “health and sanitation” concerns of the affected population include following challenges to be met:

- 1 Doorstep delivery of medical assistance;
- 2 Administering First Aid to the injured and shifting patients to the nearest medical care units/clinics/hospitals;

- 3 Assisting doctors in facilitating medical aid and assistance in remote locations;
- 4 Identification and purification of safe drinking water sources;
- 5 Ensuring temporary sanitation facilities near the shelter sites;
- 6 Awareness in health and hygiene to prevent epidemics; and
- 7 Launching cleaning operations soon after the disaster.

A look at the experience gained by the national and international health teams during Gujarat Earthquake-2001 would reveal details about various tasks associated in addressing the health and hygiene concerns during the response as well as post-disaster phases as follows:

- Inventory of all agencies working in health sector was developed.
- Sub-groups were formed on hospitals, rehabilitation of health infrastructure, nutrition, health promotion, psychological support, reproductive and child health, rehabilitation and prostheses. For this purpose, lead agencies were established and they held separate group meetings.
- The Weekly District Health Coordination meetings started in the first week of February 2001. These meetings coordinated the overall health activities in the area and kept a record of the progress as well as the location of the outbreak of any disease.
- Within a month, the coordination meetings were further decentralized to the worst affected *talukas* like Anjar, Bachau, Bhuj and Rapar in Kutch District. Apart from sharing and providing information on diseases, these weekly meetings took up issues of water and sanitation, hygiene promotion, rehabilitation of people with disabilities, reconstruction of health facilities etc.
- Trained health surveillance staff were mobilized from other States to the earthquake-hit area, to monitor the situation.
- During the transitional phase from emergency relief to long-term rehabilitation, the disease surveillance system was expanded from the five worst affected *talukas* to all the 10 *talukas* in Kutch District.
- Thirteen latrines were provided in emergency campsites within Bhuj municipality.
- The involvement of the private sector emerged as a good practice as it facilitated a systematic reporting system between the government and the private sector. Thus, for the first time, private practitioners were involved in the post-disaster rehabilitation process. This was so successful that it was felt that it should be practiced as a routine even from the preparedness point of view.

3.2.7 Documentation

In the chaotic circumstances which tend to exist following a disaster, it is often not easy to obtain accurate and complete information. However, without accurate and comprehensive information, it becomes difficult to ensure that response operations are focussed upon the correct tasks in the right and desired order or priority. We have discussed earlier (see section 3.2.5) the need for the logistics coordinator to document inventories of various types of equipment.

Control Rooms and Emergency Operations Centers are essential for effective information management. Such Centers ensure that information is correctly processed according to the proven cycle of: (a) acquisition of information, (b) documentation of

information, (c) assessment of information, (d) decision making and (e) dissemination of decisions and information.

Any logistics planning is required to contain information and control system, since accountability and monitoring of performance against realistic and continually assessed standards are important to the success of the operation and to the donors. To achieve this, procedures must be established for recording/documenting and reporting on the quantity, location and condition of commodities, where and when they will move next, and who is responsible for them at each stage. This requires a set of requisition forms, waybills, stock records and reporting formats. Following is an illustrative list of the type of documentation that is required to be taken up during logistics operations. Look at the various forms used. The nomenclature of such forms may vary from organization to organization and country to country, however, all such forms/reports/formats serve the basic purpose of documenting information vital to logistics operations:

- **SITREPS or Situation Reports:** Brief updates describing the current situation at the disaster site with regards to the nature and magnitude of impact, actions taken by various stakeholders, immediate problems, resources available/required to meet specific needs, hidden threats, if any. Such reports are issued frequently by a variety of stakeholders that are operating at the disaster site. These are usually in the form of updates on the changing situation at the site and apprise the world at large as to the progress of things.
- **Relief Commodity Movement Form:** Used to document what is coming from what source and where is it going. This documentation is very crucial in determining that specific needs of specific groups/areas are being met and if not, what further actions are required.
- **Specific Resources Request Form:** Used for documenting specific/sector-based/area-wise resource requirements.
- **Transportation Operations Form:** Used to document what resources – personnel, equipment, commodities and supplies – move from what point to what destination.
- **Inventories:** Various types of inventories used to document availability of a range of resources, for example, (a) inventory of all organizations working in health in the affected area, (b) inventory of suppliers of tents and temporary shelter material.
- **Mapping:** Used for documenting (a) worst-hit areas, (b) movement of Search and Rescue Teams, (c) location of various relief organizations, (d) location of local emergency management authorities like fire brigade, army posts, police stations, hospitals, communications centers, (e) key logistics features such as airfields or railway stations, (f) any security incidents, (g) hazards mapping, (h) tropical cyclone threat mapping etc.
- **Log Books:** Used for documenting all telephone and radio messages sent and received and action taken.

- **Notice Boards:** Used for documenting and disseminating information regarding relief operations, coordination meetings, assessment missions, important contact coordinates (telephone numbers, email addresses, location of relief distribution centers etc.).
- **GIS Tools:** Used for facilitating record keeping and documenting the status of ongoing work. As work is completed and identified, GIS can visually display current project status.

3.2.8 Clearance of Debris and Disposal of Dead

In Section 3.2.1 earlier, we have discussed those conditions when “selected debris” and “general debris” removals are taken up under the Rescue Operations. Clearing the debris off a disaster site and disposing the dead (humans as well as animals) are the challenging tasks. The fallen structures environment which could be a result of an earthquake, or a landslide, or a cyclone or floods poses a threat to survivors and unless dealt with in time, it obstructs all initiatives and efforts being made to restore normalcy.

Traditionally, the State Relief Codes in India have cast this responsibility on the local administration, i.e., the District Collectors. Section 304 (f) of the Gujarat State Relief Manual, for example, states that police assistance may be necessary in inquiring into the causes of deaths during and after the disaster and in the disposal of the corpses. The particulars regarding the dead persons that may be available with the police authorities will be required for being passed on to the next of kin, if known. Similarly, Section 73 of the Orissa Relief Code requires Collectors to dispose of immediately the dead bodies (both of humans and animals) thrown or floating here and there following high floods and cyclones.

It is known that in the event the local authorities are not in a position (for a variety of reasons) to attend to such tasks, the Indian Armed Forces have always taken lead. For instance, following Gujarat Earthquake-2001, when after the devastating quake of 26th January 2001 several small and big tremors continued to shock people of Kutchch, the residents had fled their houses and returned only after couple of days to their homes. The large-scale deaths caused by the earthquake required immediate disposal of dead persons. The Indian Army being one of the first responders on site continually and tirelessly carried out this valuable task.

Unless planned for in advance and prior to the disaster, the task of clearing debris and disposal of dead bodies and carcasses always poses difficulties. Persons tasked with such responsibilities are required to be in excellent mental and physical health and preferably in the younger age group (25-35).

The removal of debris cannot be effective unless decisions are made prior to the disaster regarding the transportation requirements; the site where the debris is to be moved; possible reuse and recycling of the material recovered from fallen structures etc.

Bodies need to be protected from rodents, animals and birds. Necessary space for burial and cremation also needs to be considered at the site planning stage,

particularly in crowded settlements. A typical “Dead Bodies Disposal Group” carries out following tasks:

- Ensuring adequate stocks of kerosene, fire-wood, shrouds etc. for cremation purposes;
- Selecting appropriate site for cremation/burial;
- Collecting dead bodies, documenting their descriptions, carrying out *Panchanamas* to facilitate identification of the dead; and
- Disposing carcasses and spraying disinfectants at the site.

A look at the statistics following a major disaster in India would suffice to outline the importance of tasks outlined above. For instance, in the Orissa Super Cyclone of October 1999, human lives lost were 9,893; the livestock perished was 444,531 and the 747,863 houses had fully collapsed. These numbers clearly indicate the magnitude of the clearing and disposal tasks that follow such calamities.

3.3 CONCLUSION

In this unit, we have discussed the overall aspects of logistics management as relevant to disaster response phase. Key components discussed in detail are that of the procedures for Search and Rescue and Evacuation and the common practices for Clearance of Debris and Disposal of Dead. Major concerns related to the Supplies, Equipment, Transportation and Health and Hygiene have also been outlined. The significance of documentation is highlighted. Note that selected illustrations from recent Indian disasters have been used along with relevant legislative provisions in order to facilitate in-depth understanding of some the components discussed.

3.4 KEY CONCEPTS

Canine Search: Search made by specially trained dogs for tracing victims (alive and/or dead) entrapped under fallen structures.

Emergency Operations Center: A Control and Command Post set up (usually at headquarters) to supervise all matters pertaining to a given disaster/emergency.

Evacuation: Moving people at risk to safer environment.

Evacuation Kit: A kit used by evacuees containing basic supplies required to sustain themselves away from home.

Evacuation Center: A center set up by the local authorities (or other organizations) for housing evacuees and supervising related matters.

INSARAG: Acronym for International Search and Rescue Advisory Group

Logistics: Procurement and delivery of right supplies, in right quantities, in right order, in good condition and at right time.

Populations at risk: Groups of people exposed to threats concerning their life and/or property.

Rescue Kit: A kit assembled to help an individual and/or family in times of crisis, to escape the disaster.

Search and Rescue: Term used for searching and rescuing victims of a disaster.

SITREPs: Acronym for Situation Reports

UNDAC Team: Acronym for the United Nations Disaster Assessment and Coordination Team

3.5 References and Further Reading

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The Gujarat Government Gazette, 2003, *The Gujarat State Disaster Management Act*, Act No. 20 of 2003, Ahmedabad.

United Nations Office for the Coordination of Humanitarian Affairs, 2002, *UNDAC Field Handbook*, Geneva.

USAID, 1998, *Field Operations Guide for Disaster Assessment and Response*, Bureau for Humanitarian Response, Office of Foreign Disaster Assistance, Washington DC.

3.6 ACTIVITIES

1. State the mandatory provisions that exist in India for fixing the search and rescue responsibilities.
2. Explain briefly the value of preparing and maintaining inventories for logistics management.
3. Outline the major health and hygiene concerns which need to be addressed following a major disaster.